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**Levering Up to Do Good: Direct
Long–Short Investing and Charitable Giving**

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Levering Up to Do Good: Direct Long–Short Investing and Charitable Giving

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KEY FINDINGS

- For tax-aware long–short factor strategies, higher leverage leads to higher donation capacity and efficiency. This means that, for a given donation target, leverage helps remove more of the built-in gain from the strategy portfolio via donations of appreciated stock.
- From a tax perspective, removing more built-in gains leads to two benefits: a substantial loss-realization boost and an increase in flexibility to modify the strategy portfolio—for example, from long–short to long–only.
- Higher-leverage strategies yield both higher pretax alpha and higher tax benefits, thereby increasing the after-tax value of investing in a long–short factor strategy, and higher levels of donation help increase tax benefits even further. Importantly, there is an interaction effect: Tax benefits derived from donations increase with leverage.

ABSTRACT

The authors use historical strategy simulations to evaluate the advantages of donating appreciated stock in the context of tax-aware long–short factor strategies. Their main findings are as follows. First, long–short strategies have a higher donation capacity than long–only investments, and their donation capacity increases with leverage. Second, long–short strategies have a higher donation efficiency than long–only investments. Similar to donation capacity, donation efficiency increases with leverage. Third, long–short strategies receive a larger loss-realization boost from the donation of appreciated stocks than long–only investments, which also increases with leverage. Fourth, by removing appreciated positions from the strategy portfolio, higher donation targets reduce the tax costs of modifying the long–short strategy—for example, transitioning it to a long–only portfolio. Finally, when stock donations are done without replenishment, long–short portfolios offer pretax and after-tax performance that is far superior to that of long–only investment. Here, too, pretax and after-tax values achieved with long–short investments increase with leverage.

In her 2004 article, Barbara Hauser highlights the significance of charitable giving, stating, “Charitable giving is a big business, especially in the United States, where as much as \$120 billion a year is estimated as the total of charitable contributions by individuals” (see p. 23). Fast forward to 2022, and charitable giving by US individuals has surged to \$320 billion, outpacing inflation by almost three times (see, for example, National Philanthropic Trust 2024). Hauser (2006) identified philanthropic

skills among the four key wealth-management skills for younger generations of affluent families, alongside accounting, investment, and legal skills.

Donating appreciated securities lies at the intersection of philanthropic, investing, and accounting skills. Although at the heart of philanthropy might be “an urge to help others to whom we can relate” (Hauser 2004), tax considerations remain an important driver behind charitable giving (see, for example, the discussion in Diehl 2017). Gifting stock instead of cash combines the best of both worlds, as it integrates tax-management objectives with charitable goals. According to Lucas (2020), “using highly appreciated securities instead of cash to make philanthropic grants increases the government’s stake in your gifting because capital gains tax that would otherwise go to the government goes to the grantee. [...] The US government allows this to encourage citizens to be philanthropic.”

Furthermore, several recent articles suggest that donating appreciated securities could increase the tax benefits achieved by direct-indexing strategies (Chaudhuri, Burnham, and Lo 2020; Shalett et al. 2022; Herzog, Jones, and Safaee 2023). Specifically, Sosner, Gromis, and Krasner (2022) find that combining direct indexing with a charitable giving program, which contributes 1% of the strategy portfolio value to charity every month and replenishes the contributed portions with cash that is immediately reinvested, significantly increases the tax benefits of a direct-indexing strategy. They show an increase in tax benefits of approximately 110 bps per year when the strategy’s tax losses can be used to offset short-term capital gains, and approximately 80 bps per year when the strategy’s tax losses offset only long-term capital gains. This represents a very meaningful increase in tax benefits, considering that, after five years, annual tax benefits of a direct-indexing strategy without charitable giving decline to a 20 to 30 bps range if its losses can be used to offset short-term gains, and to zero if its losses offset only long-term gains.

Lieberman et al. (2023) show that novel tax-aware long–short factor strategies deliver substantially higher tax benefits and realize substantially larger net capital losses than traditional direct indexing. In our article, we model the same strategies as Lieberman et al. (2023) to evaluate the interaction between charitable giving and leveraged long–short strategies. Using these strategies, we formulate and test four hypotheses.

First, as the strategy’s leverage increases, the value of long positions relative to invested capital also increases. As a result, the value of positions that can be donated increases as well. We define the ability to donate appreciated stocks to satisfy a donation target as *donation capacity*. Our *hypothesis one* is: Higher leverage, due to a larger value of positions that could be candidates for donation, should lead to a greater donation capacity.

Second, since higher-leverage strategies can accumulate larger built-in gains because of the larger value of their positions, then for the same donation value, more of the built-in gain can be disposed of. We define the ratio of built-in gain disposed of via donation to the value of the donation as *donation efficiency*. Our *hypothesis two* is: Higher leverage should lead to higher donation efficiency for the strategy.

Third, if leveraged long–short strategies have a higher donation capacity and efficiency, they should be more effective than direct-indexing strategies at removing appreciated stocks from their portfolios. Less unrealized gains in portfolio positions means more opportunities to realize net capital losses. Therefore, compared to direct indexing, long–short strategies should have a greater potential for increasing the magnitude of capital loss realization as the donation target increases. We define this ability to achieve higher loss realizations at higher donation targets as *loss-realization boost*. Our *hypothesis three* is: Higher leverage should lead to a higher loss-realization boost from donating appreciated stocks.

There is one important *corollary* to the third hypothesis. For long–only investments, the value of stock positions is anchored to the portfolio net asset value (NAV). As a result, for these investments, donating stocks without replenishment with cash

reduces both the NAV and the value of stock positions. In contrast, when the NAV of a long–short strategy is reduced by donations without replenishment, the strategy can simply increase its leverage as a percentage of the NAV to keep the value of long and short extensions unchanged.¹ This ability to modulate leverage should increase both the pretax profits and the loss-realization benefits derived from long–short strategies.

Finally, removing a larger amount of appreciated stock positions gives the investor greater *flexibility* to adjust the strategy portfolio. Specifically, the investor might eventually want to reduce the tracking error and leverage of the strategy (see, for example, Liberman et al. 2023), or even completely eliminate leverage and transition the strategy to a long–only investment. In this article, we focus on the latter: transitioning a long–short strategy to a long–only investment. Having less built-in gain in the portfolio can reduce the cost of changing the portfolio structure from long–short to long–only. Whereas higher leverage should result in a higher tax cost of transition to long–only, donating appreciated stocks should reduce these costs more for higher-leverage strategies. Our *hypothesis four* is: Donating appreciated stocks results in a larger reduction in the tax costs of transition to long–only for higher-leverage strategies, thereby offering investors greater flexibility to modify their portfolios.

To our knowledge, this study is the first to explore the interaction effects between leverage and the donation of appreciated stocks. As noted by Liberman et al. (2023), ongoing innovations in private wealth management are making long–short investing accessible for progressively smaller accounts. Given the importance of charity in overall financial planning, now is the time for private wealth advisors to understand how the benefits derived from long–short investing and charitable giving can complement each other.

THE BENEFIT OF DONATING STOCK VERSUS DONATING CASH

In this article, we assume that only long-term positions, those held for longer than one year, are donated to charity. This is because for short-term positions, held for one year or less, the amount considered as a charitable contribution is their fair market value *reduced* by the capital gain that would be realized if the positions were sold at their fair market value at the time of the contribution.²

The tax benefit of donating stock in comparison to donating cash is affected by four parameters. The first parameter is the effective tax rate applicable to the built-in capital gains that are disposed of through the donation of stock. The higher the effective tax rate, the greater the relative benefit of donating stock. Sosner, Gromis, and Krasner (2022, Appendix B) show that the effective tax rate on built-in gains increases with the capital gains tax rate at the time of liquidation and decreases with the expected time until liquidation, probability of step-up in the cost basis at death, and probability of donating the position in the future. In other words, from a tax perspective, donating an appreciated position today is particularly valuable for those investors who either expect their tax rates to increase, expect to liquidate the appreciated position in a taxable liquidation in the near future, or both.

The second parameter is the rate of tax benefit derived from replacing the appreciated position with a new one, as would be the case for a portfolio utilized in a charitable giving program in which appreciated positions are donated and replaced with cash of equal value. Similar to the first parameter, the higher the tax benefit, the greater the relative advantage of donating stock. The tax benefit occurs because,

¹A long extension consists of long portfolio positions purchased using a margin loan. A short extension consists of short portfolio positions. For example, in a 150/50 long–short strategy, both the long and short extension equal 50% of the NAV.

²Internal Revenue Code (IRC) Section 170(e)(1)(A).

in contrast to a highly appreciated position, a newly acquired position is significantly more likely to be liquidated at a loss in the future, thus giving rise to a tax benefit. (Appendix A further elaborates on this effect.) The level of tax benefit will depend on portfolio characteristics, such as portfolio composition, tracking error, and constraints on trades and positions, as well as the manager’s propensity to realize losses when an opportunity presents itself. The more diversified the portfolio, the looser the portfolio constraints, and the more likely the manager is to realize losses, the higher the expected tax benefit from new positions.

The third parameter is the level of built-in gain of the donated position—that is, the difference between the position’s value and its cost basis. The higher the built-in gain of the position, the greater the impact of the previous two parameters—the effective tax rate and the rate of tax benefit—which in turn makes donating stock more attractive relative to donating cash. This is intuitive: The higher the built-in gain that the investor disposes of, the greater the benefit of avoiding liquidation tax, especially if the effective liquidation tax rate is high. Moreover, the more appreciated the position, the greater the increase in the opportunities for realizing a loss as a result of replacing this appreciated position with a new one.

The fourth parameter is the ratio of the value of the overall donation to adjusted gross income (AGI). The relationship between this parameter and the difference in tax benefit from donating stock and donating cash is nonmonotonic. Under the current federal tax law, for 50% charitable organizations,³ when the value of the donation is smaller than 30% of AGI, donating appreciated stock is preferable to donating cash.⁴ Similarly, when the AGI is low compared to the donation value, donating appreciated stock might also be more advantageous from a tax perspective. (This is because when AGI is low, the charitable deduction is limited for both stock and cash donations. Donating stock, however, might yield additional tax benefits in the form of avoiding liquidation tax on the appreciated stock and increasing potential future tax benefits from acquiring new positions.) On the other hand, when the donation value is in the proximity of 50% of AGI (or 60% under the temporary provisions of the Tax Cuts and Jobs Act sunsetting on January 1, 2026), it is possible that donating cash might lead to a higher tax benefit of donation.⁵

Further details can be found in Appendix A.

SIMULATION METHODOLOGY

With the exception of the new element of donations, our strategy construction methodology closely follows Liberman et al. (2023). For our tax-aware long–short

³“50% charitable organizations” means that charitable contributions to these organizations can be deducted up to 50% of AGI. Such charities include donor-advised funds (DAFs) and most public charities, such as religious organizations, educational institutions, and medical facilities. Private operating foundations, on the other hand, are subject to a lower 30% of the AGI limit. See Appendix A for further discussion.

⁴Tax rules surrounding charitable deductions are complex. For 50%-limit charitable organizations, a deduction limit of 50% of AGI is applied to contributions of cash, whereas a limit of 30% of AGI is applied to contributions of stock. (Under the Tax Cuts and Jobs Act [TCJA], the 50% of the AGI limit for cash donations was increased to 60% for the years 2018 to 2026, and then raised again under the CARES Act to 100% of AGI for the years 2020 and 2021.) Charitable contributions to 30%-limit organizations, such as private foundations, have 30% and 20% of AGI charitable deduction limits for cash and stock, respectively. Furthermore, under Internal Revenue Code (IRC) Section 170(b)(1)(C)(iii), a donor can elect to treat a capital gain asset, such as a stock, as a 50%-limit asset. However, if this election is made, IRC Section 170(e)(1)(B) will apply, and the amount considered as charitable contribution will be the fair market value of the asset *reduced* by the capital gain that would be realized if the asset were sold at its fair market value at the time of the contribution.

⁵For simplicity, we ignore the case in which the donor optimizes the mix of stock and cash donations to maximize the value of charitable deduction.

factor strategies, we employ the “relaxed-constraint” strategy methodology developed in that article. Instead of restating it here in full, we provide a brief overview and refer interested readers to the source article. All strategies are constructed using single stocks only (no ETFs or other trading instruments) over the Russell 1000 Index universe, have a beta of 1.0 to the Russell 1000 Index, and are rebalanced at a monthly frequency. We use the same assumptions about transaction and financing costs as Liberman et al. (2023), and like these authors, we perform all the calculations gross of management fees. As a result, our pretax returns are net of transaction and financing costs and gross of fees.

The direct-indexing strategy seeks to defer tax gains and realize tax losses while maintaining a tracking error (TE) of no more than 1% with respect to the benchmark index. Relaxed-constraint (RC) strategies maximize expected active pretax returns while deferring gains and realizing losses, subject to TE and leverage constraints. The expected active pretax returns come from an alpha model based on value, momentum, and quality investment themes, or factors, with each factor receiving an equal risk weight. We model three levels of leverage and TE—150/50 at 2% TE, 200/100 at 4% TE, and 250/150 at 6% TE. The values 150/50, 200/100, and 250/150 represent the size of long and short positions as a percent of the NAV. All positions in all strategies are held in individual stocks.

Our data sample begins in January 1986 and ends in December 2021. For each strategy, we simulate histories starting in January of each year from 1986 to 2021. We simulate 20-year histories where possible. We have 17 histories that span a 20-year period—the first one starts January 1986 and ends December 2005, and the last one starts January 2002 and ends December 2021. All other simulated histories end December 2021 and begin every January from 2003 to 2021. The history that starts January 2003 spans 19 years, whereas the history that starts January 2021 is only one year long.

When we calculate averages, we first average the results across simulation vintages for each year since inception. This gives us 20 averages: Year 1 results are averaged across 36 data points, from 1986 to 2021, whereas Year 20 results are averaged across 17 data points, from 2005 (for the simulation starting in 1986) to 2021 (for the simulation starting in 2002). Next, we average across the 20 annual averages to obtain the full sample average statistic. This approach prevents early years, for which we have more data points, from dominating the overall averages.

The main difference in simulation methodology between our article and Liberman et al. (2023) is the addition of stock donations. We model stock donations as follows: All donations occur at quarterly intervals. At the end of each quarter, starting from the first quarter of the second year, the annual percent donation target is divided by four and multiplied by the current portfolio NAV.⁶ This yields the donation target value in dollars. For example, if the annual percent donation target is 20%, and the portfolio NAV on March 31 is \$100, the dollar donation target in the March rebalance will be \$5 ($= 20\%/4 \times \100). By the same token, if the portfolio NAV on June 30 is \$120, the dollar donation target in the June rebalance will be \$6 ($= 20\%/4 \times \120). Recall that the portfolio is rebalanced every month, so donations affect only every third portfolio rebalance.

To identify stocks that could be donated, we rank long-term positions in the long leg of the portfolio by their built-in gains in descending order and donate stocks from the most to least appreciated, with a total value up to the dollar donation target for the given rebalance. If the dollar donation target is higher than the value of all long-term positions, all the long-term positions are donated, and the target is not achieved. In the base case, the value of donated stocks is replenished with cash, which is

⁶This marks the first quarter-end rebalance when some of the portfolio positions become long-term. The previous section explains why we only consider long-term positions for donation.

immediately invested in new portfolio positions as a part of the rebalance. In the penultimate section, we explore the effects of stock donations without replenishment.

When calculating tax benefits and liabilities, we assume that dividends on long positions are treated as qualified dividend income taxed at 23.8%, in-lieu dividends on short positions provide an offset against investment income taxed at a 40.8% rate, long-term and short-term capital gains are taxed at 23.8% and 40.8%, respectively, and net short-term capital losses only offset long-term capital gains.⁷ The last assumption conservatively reduces the benefit derived from net short-term capital losses.

Finally, we do not account for the tax benefits of charitable deductions because we assume that the investor has already committed to a charitable contribution of a particular value and is only choosing between donating cash and donating stock.

DONATION CAPACITY

Suppose that a family is committed to donating a particular fraction of their wealth to charity.⁸ Suppose furthermore that the family wealth across all its business ventures, real property, and other liquid and illiquid investments is sufficiently correlated with the market return, such that its growth can be proxied by the performance of a beta-one investment strategy. In this case, donating a percentage of a beta-one strategy portfolio value is roughly proportional to donating a fraction of family wealth. Although this framing is not essential to our analysis, it offers an intuitive justification for the way we define donation targets in this study.

Our hypothetical family considers two options of donating X dollars to charity: (1) donating X dollars of cash directly and (2) contributing X dollars of cash to the stock portfolio and donating X dollars of appreciated portfolio positions. Based on considerations outlined in the section comparing the donation of stock and cash, they choose option 2. For different equity strategies, they want to estimate the fraction of the strategy portfolio value that could be donated to meet a prespecified donation target, a measure we have defined as *donation capacity*.

Exhibit 1 shows how much the family can donate from the strategy portfolio in an average year given an annual donation target defined as a percentage of the NAV. At the end of each quarter, we compute the total market value of donated portfolio positions.⁹ Dividing this value by the current portfolio NAV yields the percentage donation for that quarter. Adding these quarterly percentages within a year gives us the annual percentage donation. Finally, we calculate the average annual percentage donation using the averaging approach detailed in the methodology section.

For the Russell 1000 Index, an annual donation target of 20% can be achieved. Even a 40% donation target is almost achieved—the average annual donation capacity at the 40% target is 38%. At a 60% target, we begin to see a shortfall to the target, in which only 50% is achieved on average. The average annual donation capacity reaches a maximum of 53% at the 80% and 100% donation targets.

In terms of donation capacity, direct indexing is similar to Russell 1000: The 20% target is achieved on average, whereas for the 40% target, 38% is achieved on average. The average donation capacity is 50%, 54%, and 56% at 60%, 80%, and 100% targets, respectively. A comparison of these results to the Russell 1000 Index results

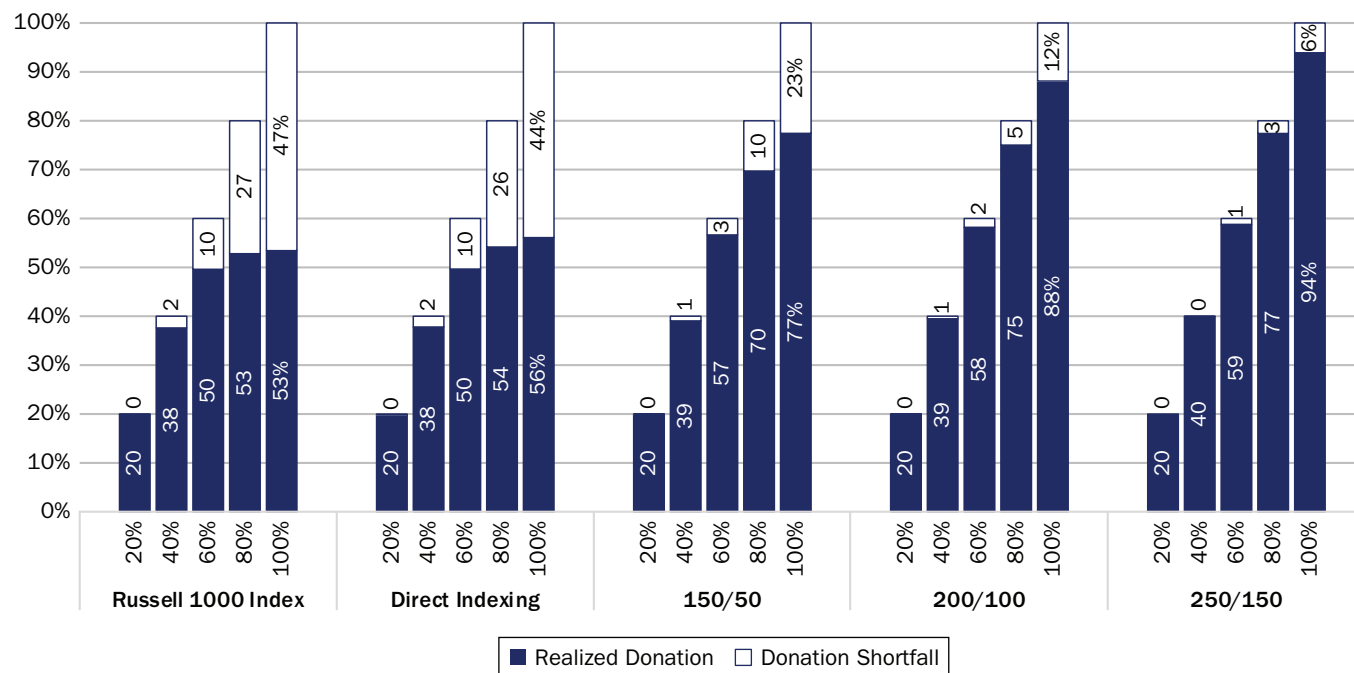
⁷ These tax rates are the highest federal bracket tax rates of 20% on long-term gains and qualified dividends, and 37% on short-term gains and ordinary income increased by the net investment income tax of 3.8%.

⁸ We recognize that in the very short run, charitable commitments can be fixed rather than proportional to wealth. We reasonably assume that over time, however, families adjust their charitable commitments to their overall wealth level.

⁹ As a reminder, only long portfolio positions held for longer than one year are donated. As a result, all donations in our simulations begin in Year 2 of the simulation.

EXHIBIT 1

Donation Capacity by Donation Target Ranging from 20% to 100%, Average over a 20-Year Investment Period



indicates that when appreciated positions are periodically removed from the portfolio, the direct indexing portfolio is not significantly more appreciated than a passive index portfolio. As a result, the value of appreciated stocks that can be donated is similar between the two strategies.

Compared to the long-only passive index and direct indexing, the three long-short strategies create opportunities for substantially larger donations of appreciated stocks. Since the notional value of long positions increases with leverage, the ability to achieve high donation targets also increases with leverage. This is particularly true for higher donation targets. For example, when the annual donation target is 100% of the portfolio NAV, the 150/50 strategy achieves a 77% donation on average, whereas 200/100 and 250/150 achieve 88% and 94%, respectively, contrasting the 53% and 56% that we have seen for the passive index and direct indexing.

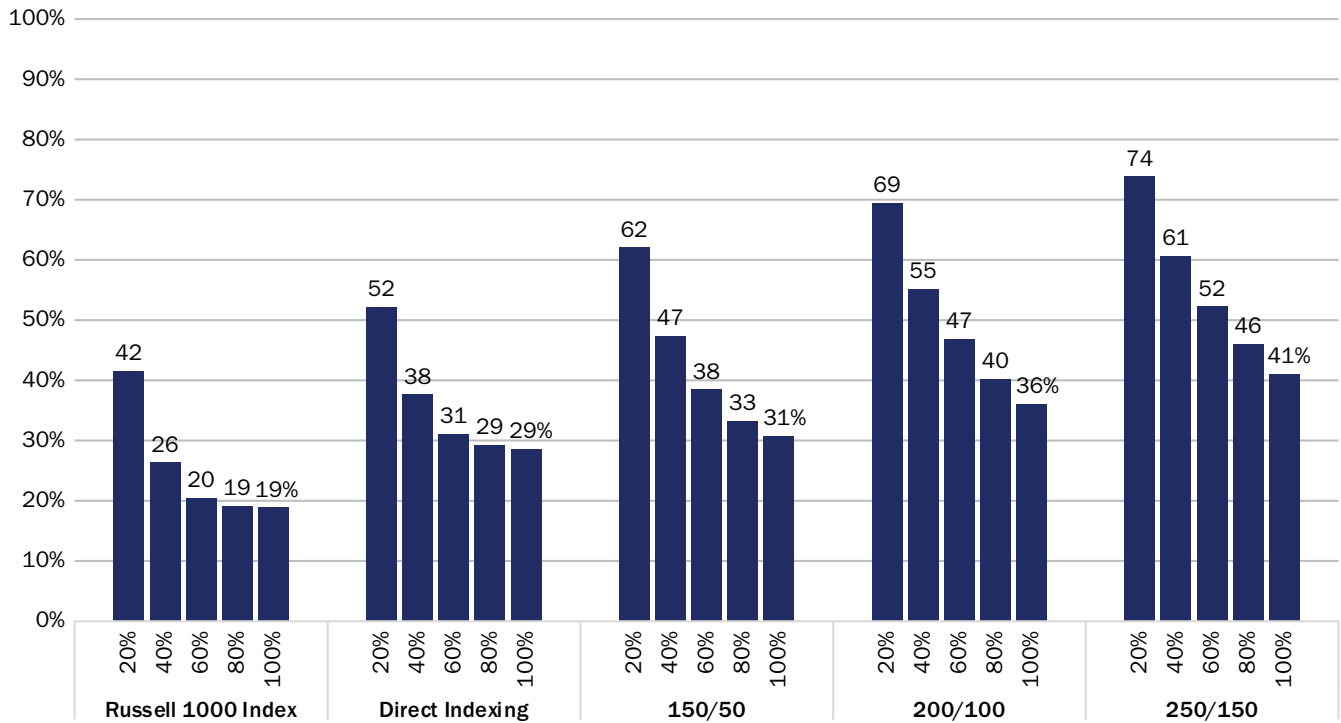
DONATION EFFICIENCY

We’ve defined donation efficiency as the ratio of built-in gains disposed of via donation to the value of the donation. As discussed in detail in Appendix A, donating appreciated stock both reduces the effective tax cost of liquidation and increases the opportunities for achieving higher tax benefits in the future. These two benefits increase with the built-in gain of donated lots of the stock. When the donation target is low, the donor can select for donation a few of the most-appreciated tax lots in the portfolio. As the donation target increases, however, the donor will have to donate progressively less-appreciated lots. At high donation levels, most, if not all, of the long-term gain lots might need to be donated indiscriminately.

Exhibit 2 shows donation efficiency for our simulated strategies. As seen in the exhibit, donation efficiency decreases with the donation target and increases with leverage. Whereas the former result is intuitive, the latter is less apparent and also new to the literature.

EXHIBIT 2

Donation Efficiency by Donation Target Ranging from 20% to 100%, Average over a 20-Year Investment Period



For the passive index, at a 20% annual donation target, the donation efficiency is 42% on average. It declines to around 26% at a 40% donation target and to around 20% when the donation target exceeds 60%. In other words, for the passive index, most of the donated value is cost basis and not the built-in gain, particularly at high donation targets.

For direct indexing, the donation efficiency at the 20% donation target is 52% and declines to 38% at the 40% donation target and to around 30% for donation targets of 60% and above. At every donation target, the donation efficiency of direct indexing is about 10% higher than that of the passive index. By comparison to the passive index, direct indexing, which tends to defer gains and realize losses and thus accumulates larger built-in gains, allows for the donation of more appreciated positions.

For the three long–short strategies, leverage creates a larger notional value of positions to donate from. As a result, as the strategy leverage increases, donation efficiency increases as well. For example, for the 20% donation target, average donation efficiency increases from 42% for the passive index to 52% for direct indexing to 62% for the 150/50. As the leverage of the long–short strategies increases to 200/100 and then to 250/150, the average donation efficiency increases to 69% and 74%, respectively. In other words, for the long–short strategies, at the 20% donation target, more than 60% of the donation value will be built-in gain.

The donation efficiency advantage of the long–short strategies is preserved at higher donation targets. For example, at the 60% target, the donation efficiency of these strategies remains significantly higher than that of the passive index and direct indexing. The latter two strategies have an average donation efficiency of 20% and 31%, respectively, whereas the 150/50, 200/100, and 250/150 strategies exhibit an average donation efficiency of 38%, 47%, and 52%, respectively.

In summary, disposing of unrealized gains is the primary benefit of donating stock. The ability to donate more appreciated positions increases this benefit. Long–short strategies can donate more appreciated positions than the passive index and direct indexing investment, thereby achieving a larger benefit from stock donations. Moreover, this benefit increases with leverage of long–short strategies.

LOSS-REALIZATION BOOST

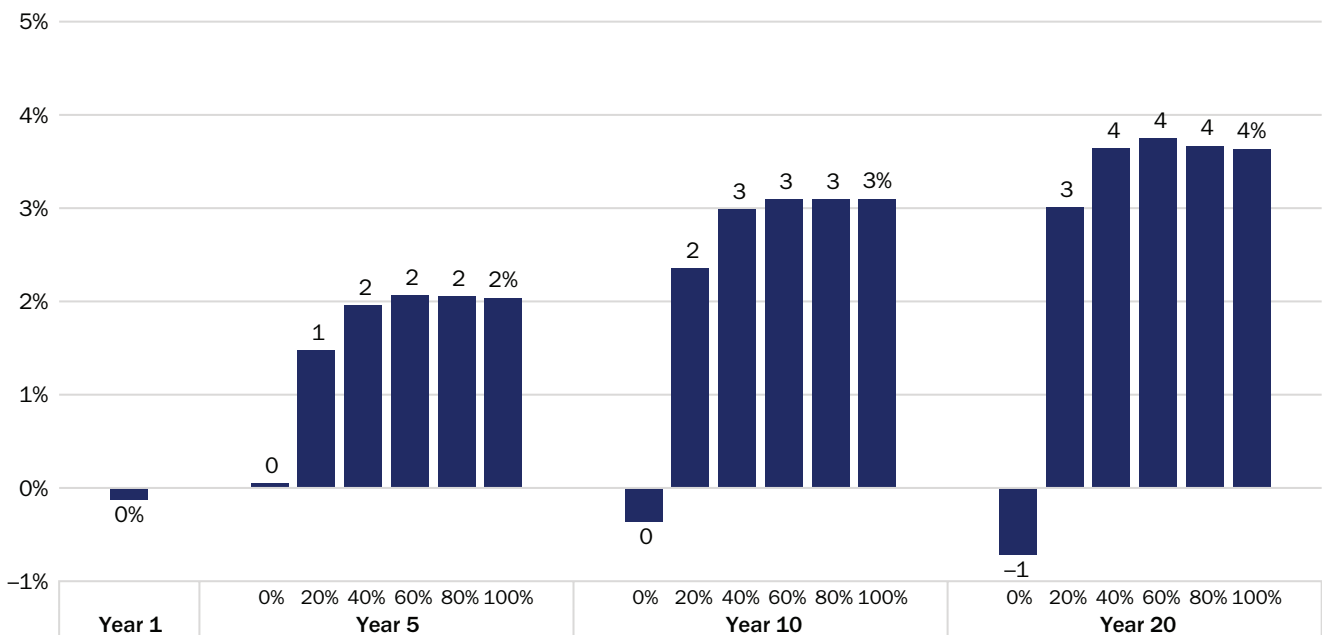
It is reasonable to conjecture that replacing highly appreciated stocks with newly acquired positions should reduce the tax cost of rebalancing the strategy portfolio. Furthermore, for strategies seeking to realize losses, such as direct indexing, this should result in a greater loss-realization potential. For strategies that tend to defer gains, such as tax-aware factor strategies (see Krasner and Sosner 2024 for details), this should lower the rate of gain realization and thus lead to higher net capital losses. We’ve defined this effect as *loss-realization boost*. In this section, we will examine the magnitude of this effect and its evolution with time since inception.

The net capital loss evolution is presented in Exhibit 3, in which we show net capital losses for Years 1, 5, 10, and 20 since inception. Let’s first consider the Russell 1000 Index. The index is not strictly a buy-and-hold portfolio, as index reconstitutions necessitate some trading. When no donations are made, this trading activity might result in a limited amount of gain recognition. As the index portfolio appreciates over time, trading driven by index reconstitutions leads to small net capital gains, observed particularly in Years 10 and 20 since inception. (Note that in Exhibit 3, net capital gains are shown as negative amounts.)

EXHIBIT 3

Realized Annual Net Capital Losses by Donation Target Ranging from No Donation to 100%

Panel A: Russell 1000 Index

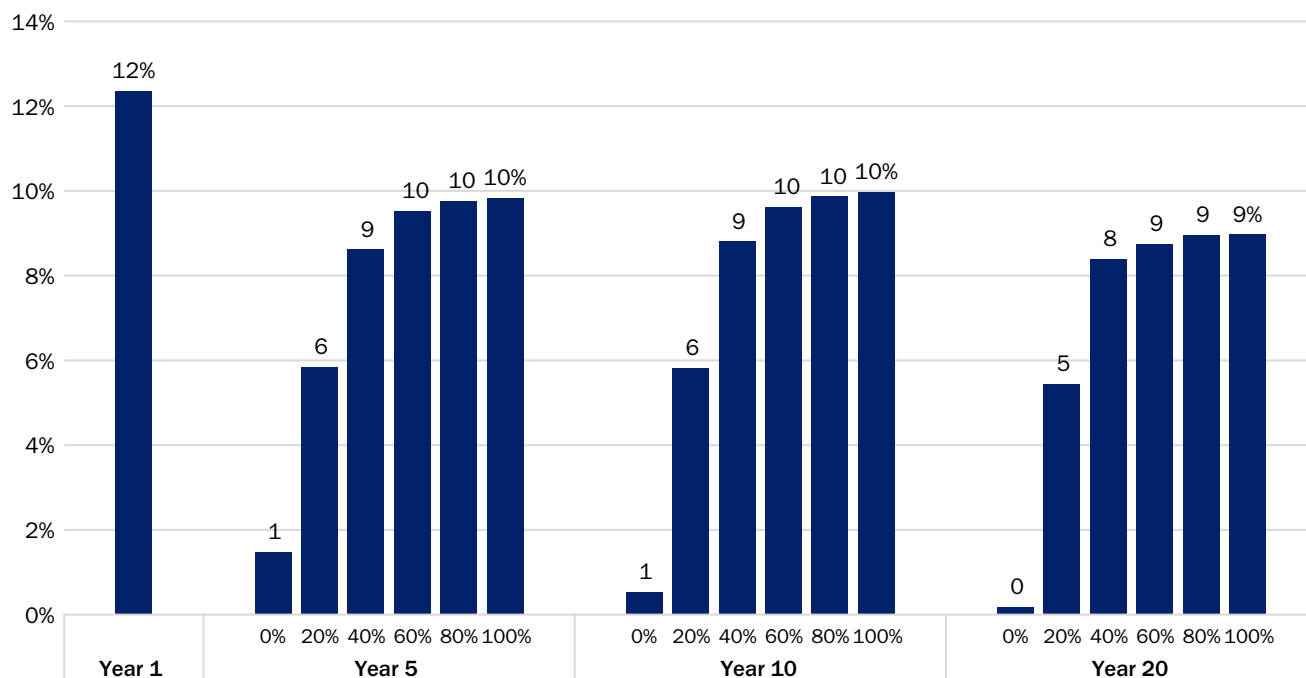


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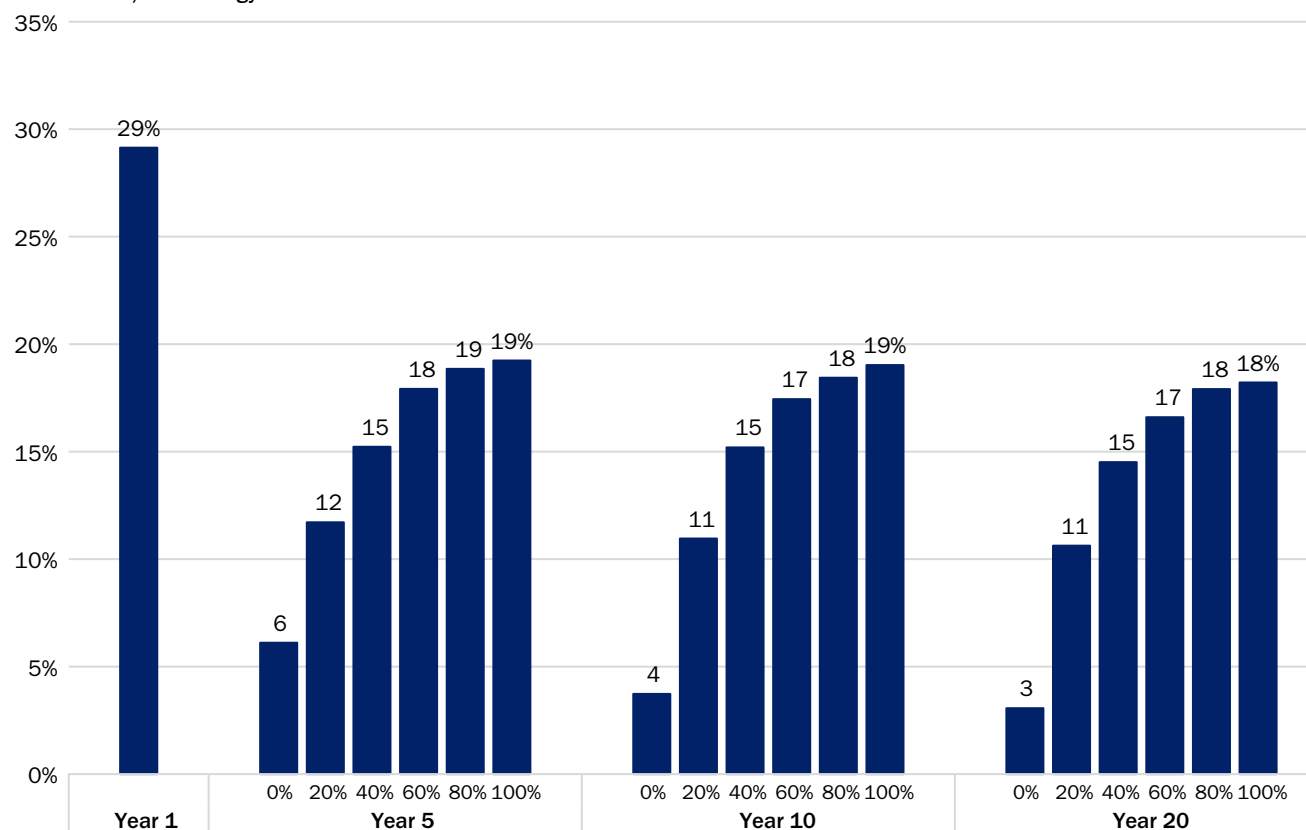
EXHIBIT 3 *(continued)*

Realized Annual Net Capital Losses by Donation Target Ranging from No Donation to 100%

Panel B: Direct Indexing



Panel C: 150/50 Strategy

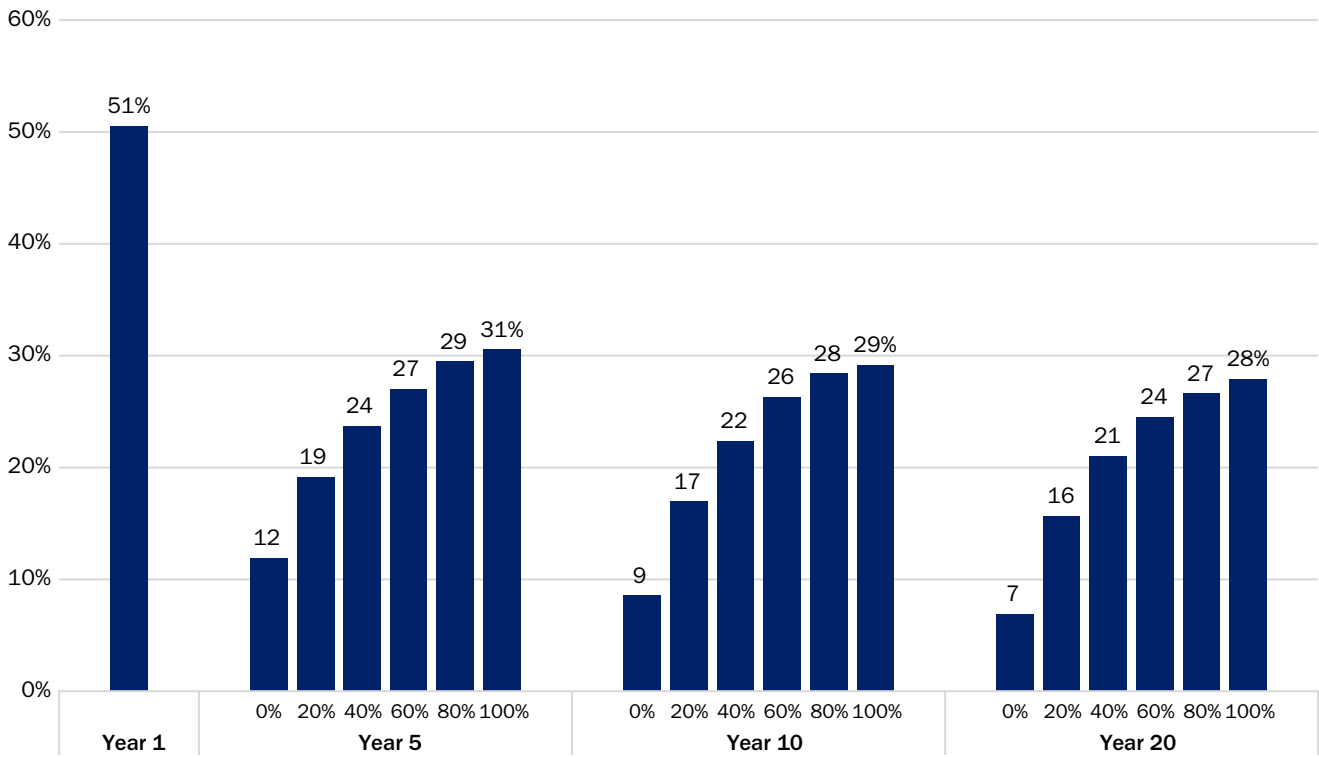


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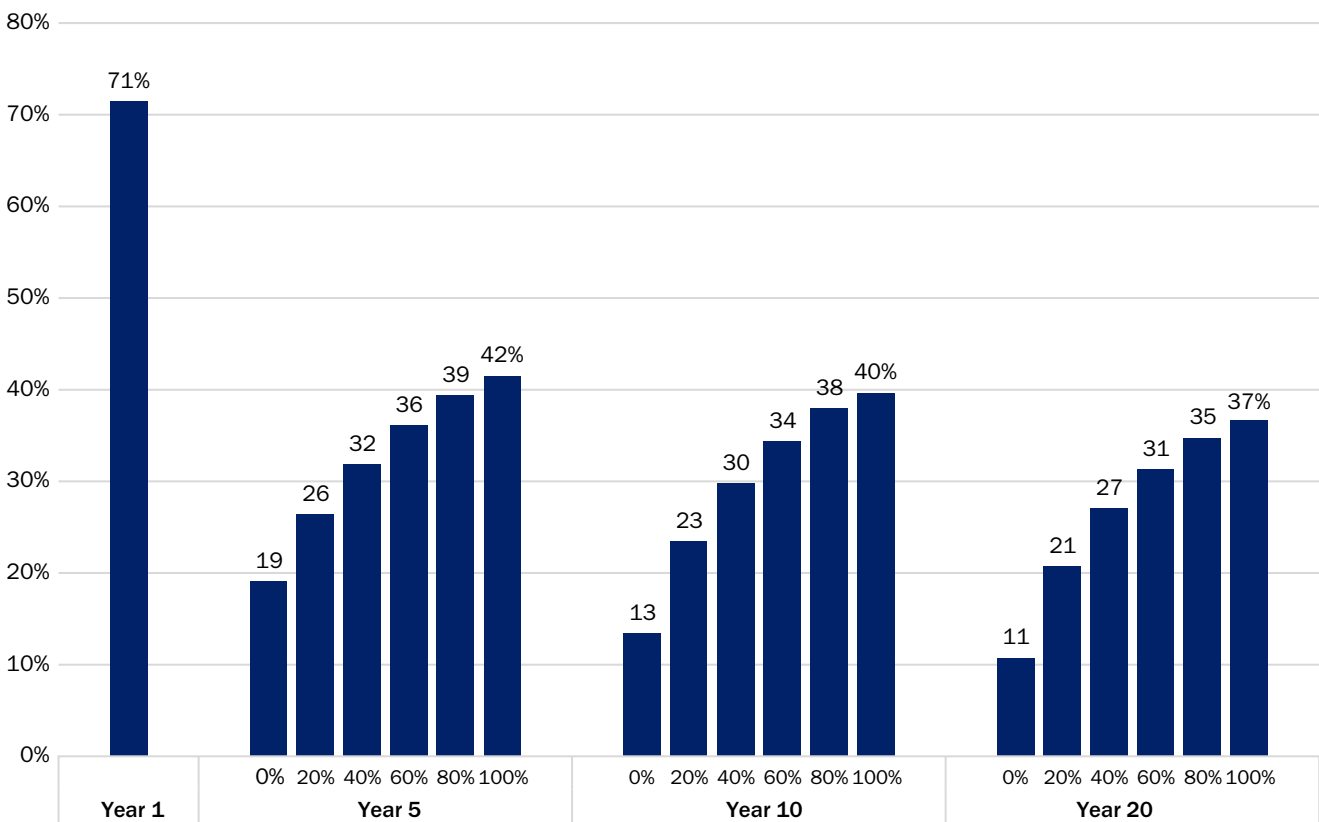
EXHIBIT 3 *(continued)*

Realized Annual Net Capital Losses by Donation Target Ranging from No Donation to 100%

Panel D: 200/100 Strategy



Panel E: 250/150 Strategy



When the passive index is combined with a charitable giving plan, from a loss-realization perspective, it begins to resemble a loss-harvesting strategy: Gains are not realized because gain positions are being removed from the portfolio, whereas losses are realized because some of the remaining loss positions are traded as a result of index reconstitutions. This effect becomes more pronounced over longer horizons. For example, in Year 10, for higher donation levels, the average net capital loss is around 3% of the portfolio NAV. By Year 20, the average annual net capital loss increases to 4% of the NAV.

The beneficial effect of donations on loss realization becomes even more pronounced for the direct indexing strategy. As previously shown in Sosner, Gromis, and Krasner (2022), although without donations, the strategy's ability to realize net capital losses fizzles out almost entirely after about five years, combining a direct indexing strategy with a charitable giving plan provides a significant boost to the strategy's loss-realization capacity.

Consistent with this earlier research, Exhibit 3 shows that, on average, direct indexing realizes a substantial net capital loss of 12% of the strategy NAV in Year 1 and that without donations, net capital losses decline to around 1% of the NAV by Year 5 and continue to decline thereafter. Donations create favorable conditions for net capital loss realization. The donation target of 20% boosts the net capital loss realization by 5% on average in Years 5, 10, and 20—from around 1% to around 6% in Years 5 and 10 and from close to 0% to around 5% in Year 20. The benefit of donations is even more pronounced for higher donation targets, in which the loss-realization boost reaches approximately 9% per year on average.

Now let's consider the three long–short strategies. We have seen in Exhibits 1 and 2 that compared to direct indexing, these strategies have the potential to donate a larger fraction of their NAV (a greater donation capacity) and tend to donate more appreciated positions to satisfy donation targets (a higher donation efficiency). As a result of these two effects, we would expect the loss-realization boost resulting from donations to be larger for the long–short strategies than for direct indexing. Moreover, we would expect the loss-realization boost to increase with leverage of the strategy.

Based on Exhibit 3, we can make three observations. First, as previously shown in Liberman et al. (2023), although net capital losses of long–short strategies decline over time, they remain substantially higher than those of direct indexing. Moreover, the higher the leverage, the higher the net capital losses. For example, in Year 10 since inception, the net capital loss realized by the direct-indexing strategy is around 1% of the NAV, whereas it is 4%, 9%, and 13% for the 150/50, 200/100, and 250/150 strategies, respectively.

Second, the loss-realization boost resulting from stock donations is larger for the long–short strategies than for direct indexing. When the donation target increases from 0% to 20%, the net capital loss of direct indexing in Year 10 increases by 5%. In the same year, for the 150/50, 200/100, and 250/150 strategies, this increase amounts to 7%, 8%, and 10%, respectively.

Third, although the loss-realization boost for direct indexing to a large extent fizzles out after the donation targets reach 40% or more, it continues to increase for the long–short strategies, particularly for the higher leverage ones. For example, in Year 10, the direct indexing strategy on average realizes an additional 4% net capital loss if the donation target is increased from 20% to 80% of the NAV. This increase in net capital loss is 7%, 11%, and 15% for the 150/50, 200/100, and 250/150 strategies, respectively.

In summary, the results in this section demonstrate that tax-aware long–short factor strategies create more tax planning opportunities for charitably inclined, tax-conscious investors. These opportunities increase with TE and leverage of the strategies. Based on these results, one could argue that thanks to the tax-beneficial interaction between leverage and charitable giving, leverage might encourage philanthropy.

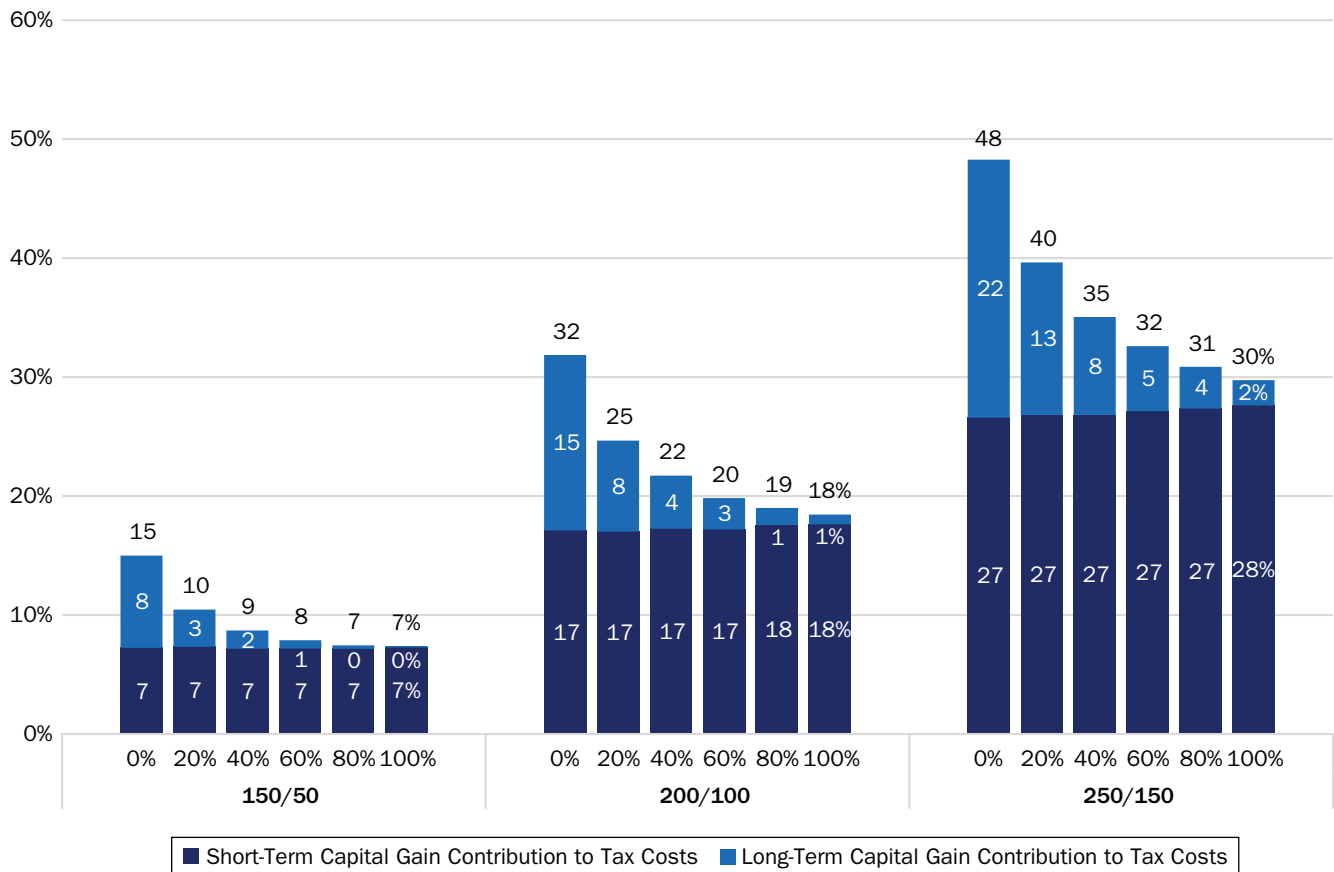
TAX COSTS OF TRANSITION TO A LONG-ONLY PORTFOLIO

Let’s assume that the family contemplates a 20-year investment horizon, after which they plan to remove exposure to the long-short strategy by transitioning to a long-only portfolio. In this study, we consider the simplest and most transparent approach to transition to a long-only portfolio: The transition occurs instantaneously on the last day of the 20-year investment period. All the short positions are liquidated, and the long extension is liquidated by selling down positions in the long portfolio pro rata.¹⁰ Short-term gains recognized as part of the transition to a long-only portfolio are netted with short-term losses realized by the strategy in the year when the transition occurs.

Exhibit 4 shows the tax cost of transition to long-only as a fraction of portfolio NAV at the time of transition. The exhibit allows us to make two observations. First, the tax cost of transition increases with leverage. This is because higher leverage strategies have larger long and short positions that need to be liquidated during the transition to long-only. Larger positions result in higher built-in gains as a fraction

EXHIBIT 4

The Tax Cost of Transition to a Long-Only Portfolio (as a percent of the NAV at the time of transition) by Donation Target Ranging from No Donation to 100%, End of a 20-Year Investment Period



¹⁰For example, if \$100 are invested in the 150/50 strategy, \$50 of the \$150 long positions are sold down by reducing every long position by 33% (= 50/150). For the 200/100 and 250/150 strategies, every long position is reduced by 50% (= 100/200) and 60% (= 150/250), respectively.

of portfolio NAV, which in turn leads to a higher tax burden when those built-in gains are realized.

Second, the tax cost of transition to a long–only portfolio declines as the donation target increases. As more and more of the appreciated positions are removed from the portfolio via donations, the gain recognized upon liquidating the long extension is reduced. This can be clearly seen from the decomposition of the tax cost into long-term and short-term gains. The cost of realizing short-term gains (which predominantly come from short positions) increases with leverage.¹¹ The cost of liquidating long-term gain positions, however, decreases substantially with donation targets.

Before concluding this section, a clarification is appropriate. Although the costs of removing extensions shown in Exhibit 4 might look high, recall that we used two conservative assumptions: (1) The extensions are fully liquidated, and (2) the liquidation of long extensions is pro rata, not tax sensitive. In reality, a family who administers its matters for two decades in a tax-conscious manner is highly unlikely to reverse their approach one day 20 years later. The transition from long–short to a long–only portfolio can be performed more tax-efficiently. Furthermore, the TE and leverage of long–short factor strategies can be reduced substantially over time without realizing any capital gains (as shown, for example, by the de-risking experiments in Liberman et al. (2023)). Since the focus of our article is on donations and not on tax-efficient portfolio transition methods, however, we limit ourselves to the most conservative transition approach.

BRINGING IT ALL TOGETHER: AFTER-TAX VALUE OF AN ACCOUNT USED FOR CHARITY

As we have seen in the previous sections, by combining charitable giving with a tax-aware investment strategy, rather than donating cash to charity directly, a charitable family can obtain tax benefits from the increased realization of capital losses. Also, although reducing the leverage of tax-aware long–short strategies might result in a realization of capital gains locked in portfolio extensions, systematically donating appreciated positions to charity reduces this tax burden. Finally, investing in tax-aware long–short factor strategies provides access to pretax factor alpha, which, as shown in Liberman et al. (2023) and Krasner and Sosner (2024), can be substantial, especially if compounded over a 20-year horizon.

To calculate the cumulative tax benefit, we assume that the strategies' net capital losses offset only long-term capital gains from other investment sources. These tax savings are then compounded at an 8% after-tax reinvestment rate. Similarly, when a strategy realizes a tax liability, this tax liability grows at the same rate of 8%. Tax costs realized upon transition to a long–only portfolio at the end of the 20-year investment period are computed as explained in the previous section.

Exhibit 5 shows the after-tax value of an account used for charity per \$1 invested. Let's first consider the pretax value, which is solely a function of the Russell 1000 Index return and the factor strategy alpha.¹² In our simulations, over a 20-year period, \$1 invested in either the Russell 1000 Index or the direct indexing strategy on average grows to about \$5.7. Over the same period, \$1 invested in the 150/50, 200/100, and 250/150 strategies appreciated to \$7.6, \$10.3, and \$13.9 before tax, respectively.

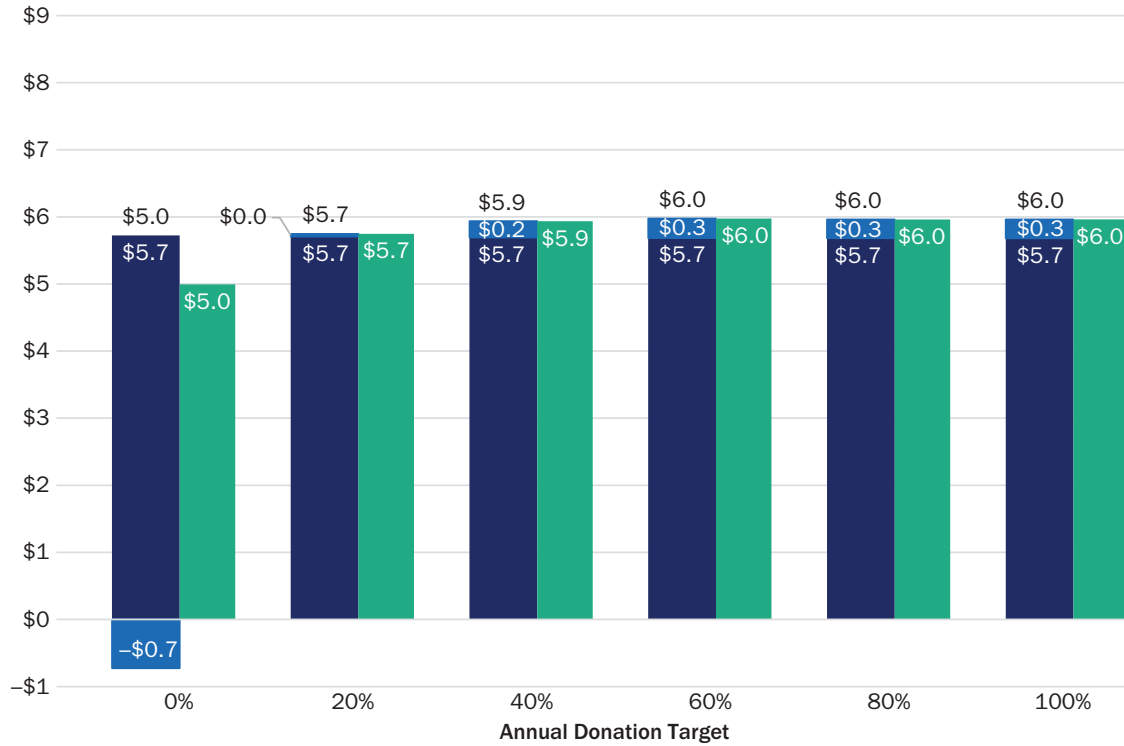
¹¹Realized gains and losses on short positions are generally short-term. See, for example, Sialm and Sosner (2018, Footnotes 5 and 6) for further details on tax treatment of short positions.

¹²As a reminder, our pretax returns are computed net of transaction and financing costs and gross of management fees.

EXHIBIT 5

After-Tax Value of an Account Used for Charity per \$1 Invested by Donation Target, End of a 20-Year Investment Period

Panel A: Russell 1000 Index



Panel B: Direct Indexing

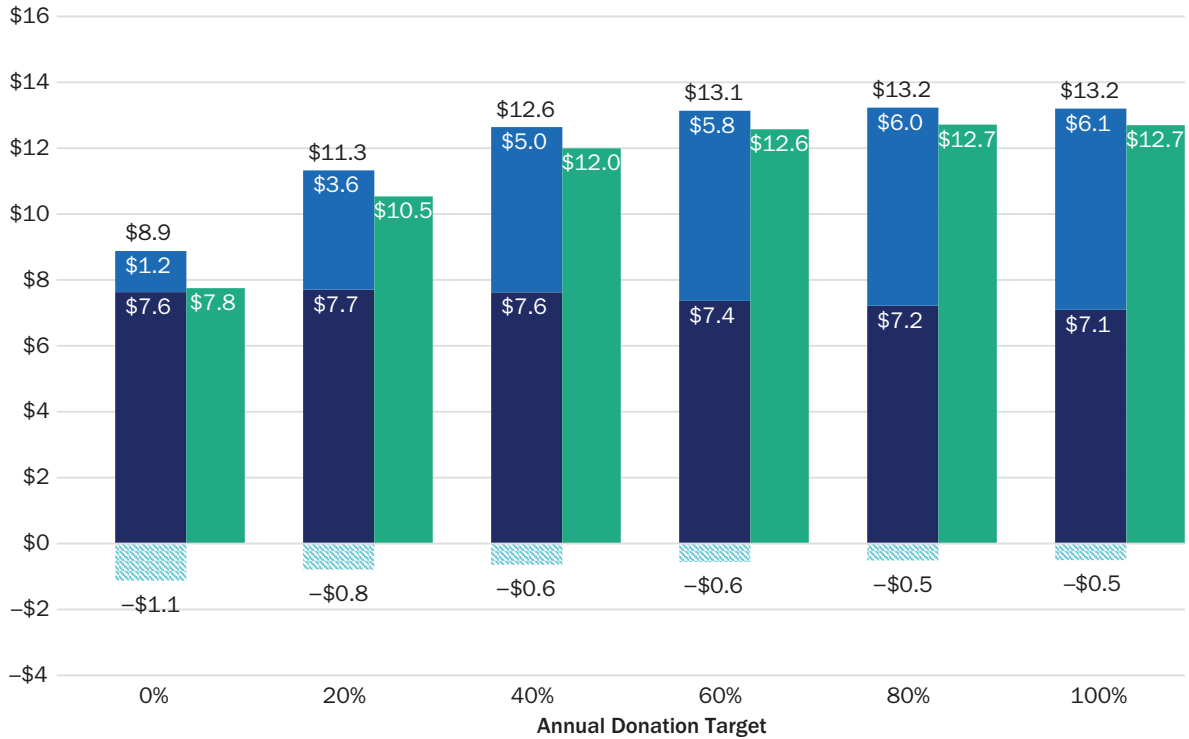


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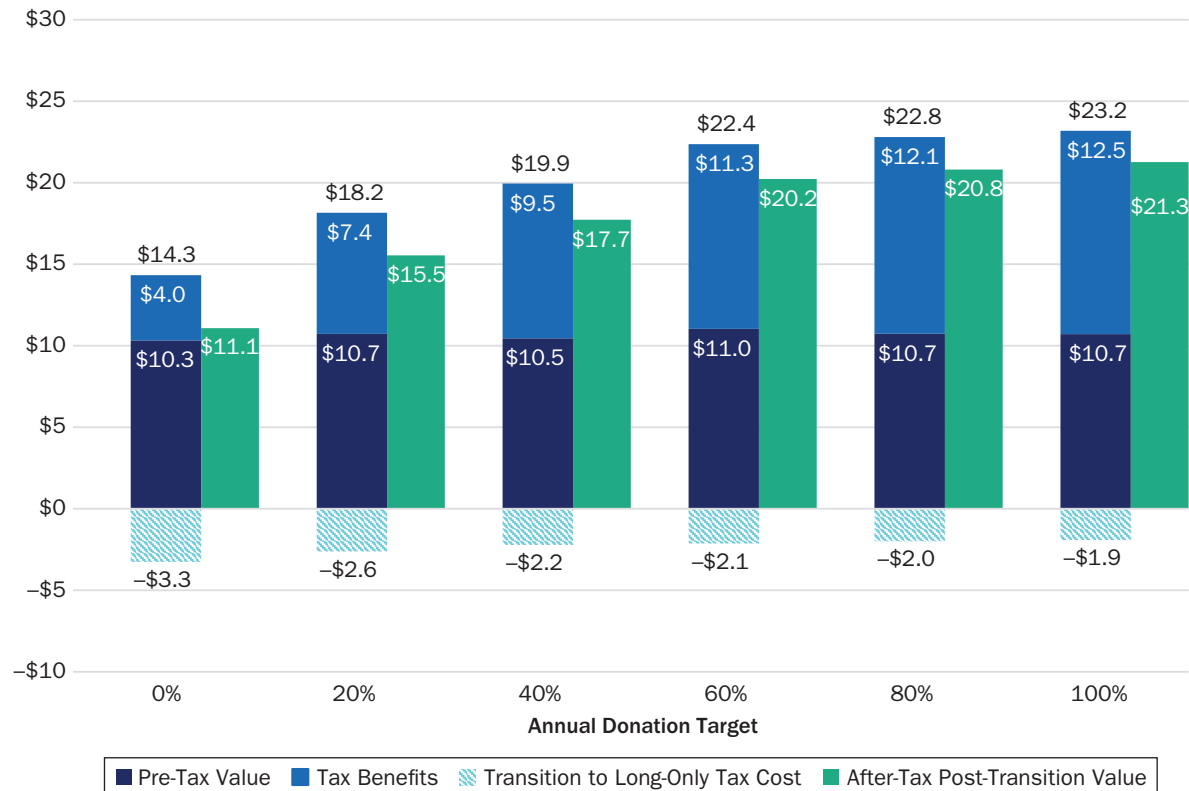
EXHIBIT 5 (continued)

After-Tax Value of an Account Used for Charity per \$1 Invested by Donation Target, End of a 20-Year Investment Period

Panel C: 150/50 Strategy



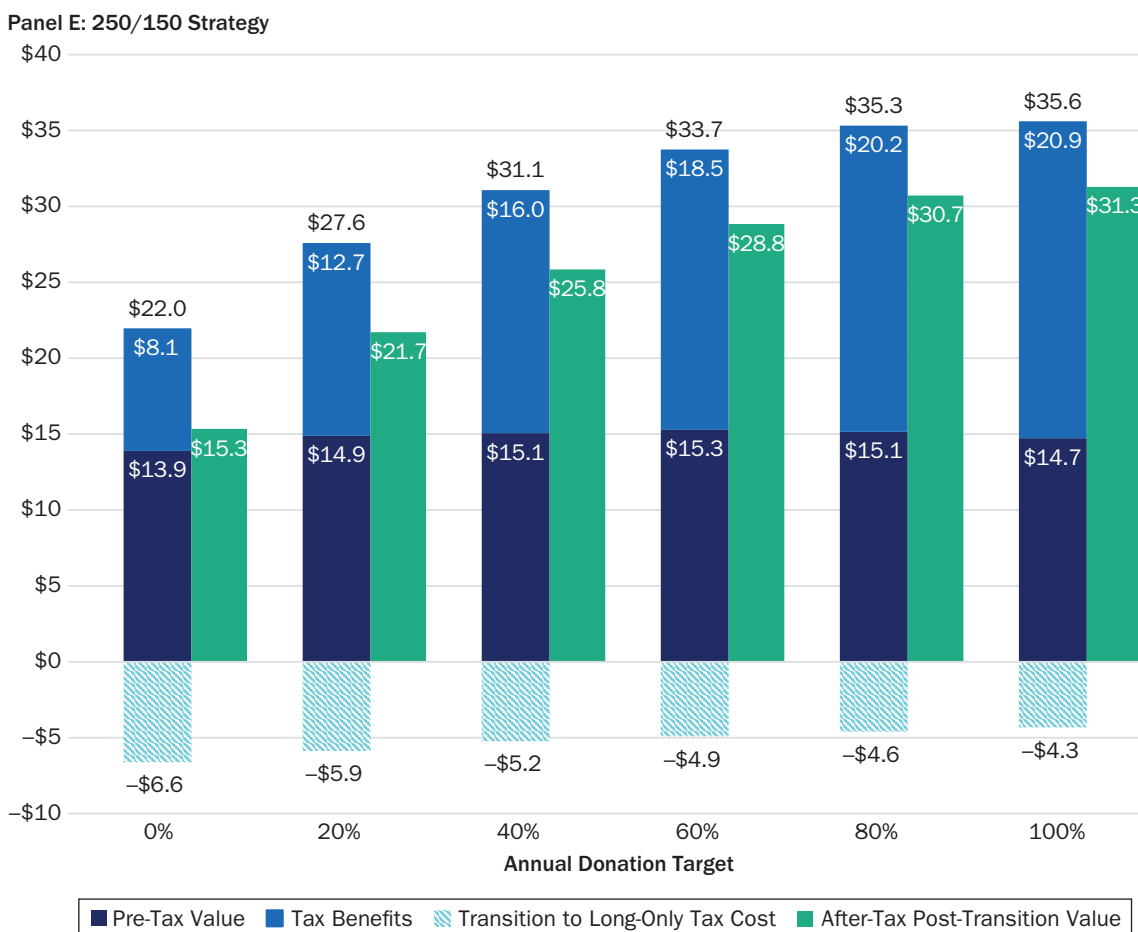
Panel D: 200/100 Strategy



(continued)

EXHIBIT 5 (continued)

After-Tax Value of an Account Used for Charity per \$1 Invested by Donation Target, End of a 20-Year Investment Period



This increase in pretax value is consistent with the TE and, therefore, pretax alpha increases with leverage.

Let’s now consider the ongoing tax benefits and liabilities of the strategies. Without donations, the Russell 1000 Index realizes an average cumulative tax liability of \$0.7 on \$1 invested over the 20-year period. This tax liability primarily arises from dividend income, and, to a lesser extent, gains realized on trades resulting from index reconstitutions. The after-tax value generated by the index is thus \$5.0, calculated as the \$5.7 of pretax appreciation reduced by the \$0.7 of cumulative tax liability.

As the donation target increases, reconstitution-related trades of the Russell 1000 Index portfolio begin to realize a small amount of capital losses. These loss realizations are unintended and solely result from removing gain positions from the portfolio via donations and trading loss positions to align portfolio weights with index weights. For example, when the donation target is 20%, the cumulative tax benefit from capital losses is approximately equal to the cumulative tax liability of dividend income, allowing the investor to fully retain the pretax value appreciation.¹³ As the

¹³Note that capital losses realized upon index portfolio rebalancing cannot offset dividend income generated by the index. We assume, however, that the realized capital losses can be used to offset long-term capital gains from other sources, resulting in a tax benefit.

donation target increases further, the index investment begins to realize a modest amount of cumulative tax benefit, thereby increasing the after-tax value above the pretax value levels.

Without donations, the direct indexing strategy realizes only a \$0.2 cumulative tax liability per \$1 invested. Since the cumulative tax liability of the benchmark index is \$0.7, this means that the direct indexing strategy realizes an excess cumulative tax benefit, often referred to as tax alpha, of \$0.5 per \$1 invested over a 20-year period. Moreover, as previously shown in Sosner, Gromis, and Krasner (2022), the direct indexing strategy begins to realize substantial tax benefits when it is combined with a charitable giving plan. For example, for the 20% donation target, direct indexing realizes an excess cumulative tax benefit of \$1.3 per dollar invested. Consistent with the net capital loss results in Exhibit 3, the tax benefits of direct indexing increase very modestly when the donation target increases beyond 40% of the NAV per annum. The total cumulative tax benefit ranges from \$2.1 at 40% target to \$2.5 at 100% target. The excess cumulative tax benefit (in excess of the Russell 1000 Index with the same donation target) ranges from \$1.9 at 40% target to \$2.2 at 100% target.¹⁴

The tax benefits of donations increase significantly as we shift our attention to the long–short strategies. For example, over a 20-year period, the 150/50 strategy realizes a \$1.2 cumulative tax benefit for every \$1 invested. Our conservative estimate of the cost of transition to long–only at the end of the 20-year period is \$1.1. At the 20% annual donation target, the cumulative tax benefit jumps by \$2.4, from \$1.2 to \$3.6, whereas the cost of transition to long–only declines by \$0.3, from \$1.1 to \$0.8. That is, the total cumulative tax benefit of adding a 20% donation target, which is composed of a \$2.4 increase in the ongoing tax benefits and a \$0.3 reduction in the cost of transition to long–only, is \$2.7 per \$1 invested. The after-tax post-transition (to long–only) value derived from \$1 invested increases from \$7.8 without donations to \$10.5 at a 20% annual donation target to \$12.0 and above when the donation target increases to 40% and beyond.

These value levels are substantially higher than those achieved by the passive index and direct indexing investments as a result of both higher pretax appreciation and higher tax benefits. Moreover, the value gap between the 150/50 and the long–only strategies increases with the donation target. For example, at the 20% donation target, the difference in after-tax post-transition value between the 150/50 and direct indexing strategies is \$3.5, whereas at the 60% target, this difference increases to \$4.8.

The benefit of adding donations increases with leverage. For the 200/100 strategy, compared to no donations, a 20% donation target results in an increase in the cumulative tax benefit of \$3.4 per \$1 invested (from \$4.0 to \$7.4) and a reduction in the transition tax cost by \$0.7 (from \$3.3 to \$2.6), amounting to a total benefit increase of \$4.1. When the leverage is further increased to 250/150, adding a 20% donation target leads to an increase of \$4.3 in the cumulative tax benefit and a reduction of \$0.7 in the cost of transition to long–only—a total increase in benefit of \$5.1. Recall that this increase was only \$2.7 for the 150/50 strategy.

As seen in Exhibit 5, donations create a substantial increase in tax benefits, which in turn translates to a substantial increase in after-tax value of an account used for charity. The increase is larger for higher leverage strategies and especially at higher donation targets. For example, when the donation target increases from 20% to 100%, the 20-year after-tax post-transition value increases by \$2.2 per dollar invested for the 150/50 strategy (from \$10.5 to \$12.7), by \$5.8 for the 200/100 strategy (from \$15.5 to \$21.3), and by \$9.6 for the 250/150 strategy (from \$21.7 to \$31.3).

¹⁴ A small reduction observed in pre-tax wealth is driven by higher transactions costs: Larger donations lead to a higher portfolio turnover and thus to higher transaction costs.

DONATION OF STOCKS WITHOUT REPLENISHMENT

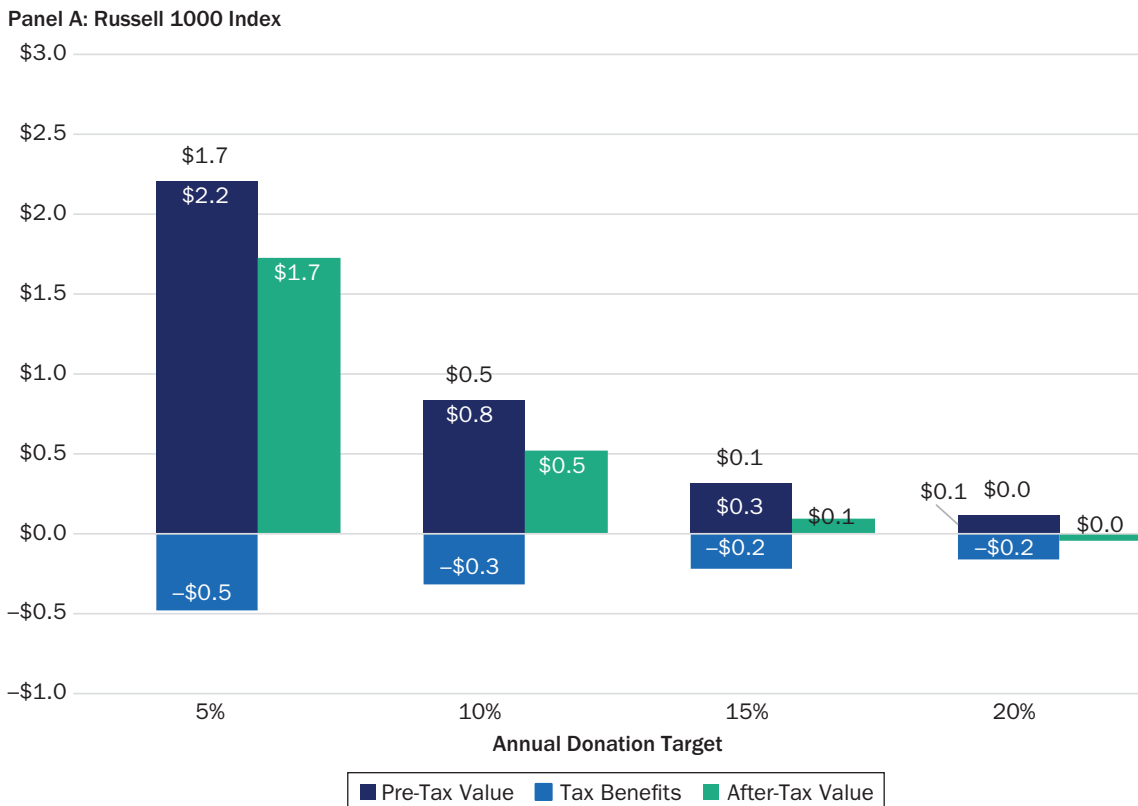
Thus far, we have only considered donations of stocks that are fully replenished with cash. What happens, however, if the family plans to donate stocks without replenishing the portfolio with cash? If stocks are donated without replenishment, the NAV of the strategy might shrink. High donation targets will likely lead the NAV to shrink to a negligible amount, even if the strategy generates high returns. As a result, in this section, we only consider annual donation targets of up to 20% of the NAV. Exhibit 6 shows the results for donating stocks without replenishment. Exhibit B1 in Appendix B shows cumulative net capital losses of the strategies for further reference.

Let’s begin with the Russell 1000 Index investment. Unlike donations with replenishment shown in Exhibit 5, donations without replenishment continue to result in a cumulative tax liability. For example, at a 20% donation target, for donations with replenishment, the cumulative tax liability is approximately \$0.0 (as seen in Exhibit 5), whereas for donations without replenishment, shown in Exhibit 6, the 20-year cumulative tax liability is \$0.2 for every \$1 invested. In the latter case, the tax liability is caused by portfolio rebalancing back to index weights once appreciated positions are removed from the portfolio. Note that this tax cost of rebalancing does not arise in the case of donations with replenishment because donated positions are simply repurchased with cash added to the portfolio.

In the case of donations without replenishment, the reduction in cumulative tax liability with the increase in donation target should not be surprising considering

EXHIBIT 6

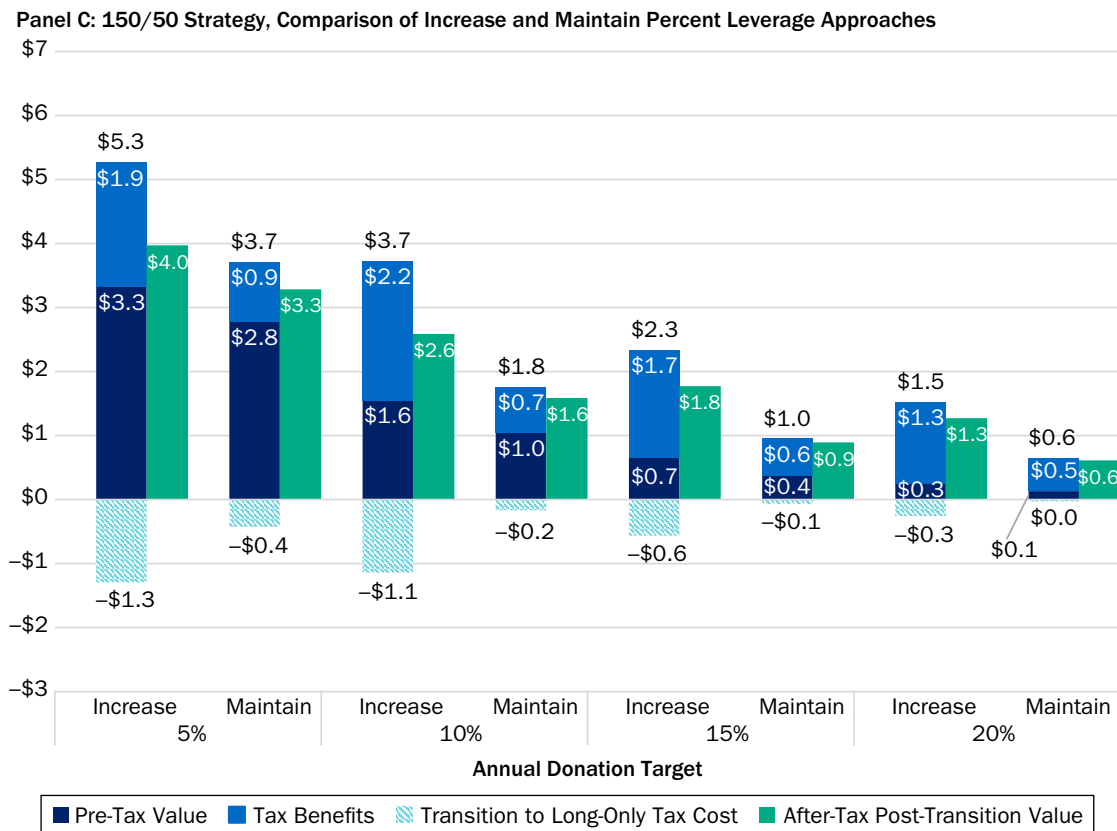
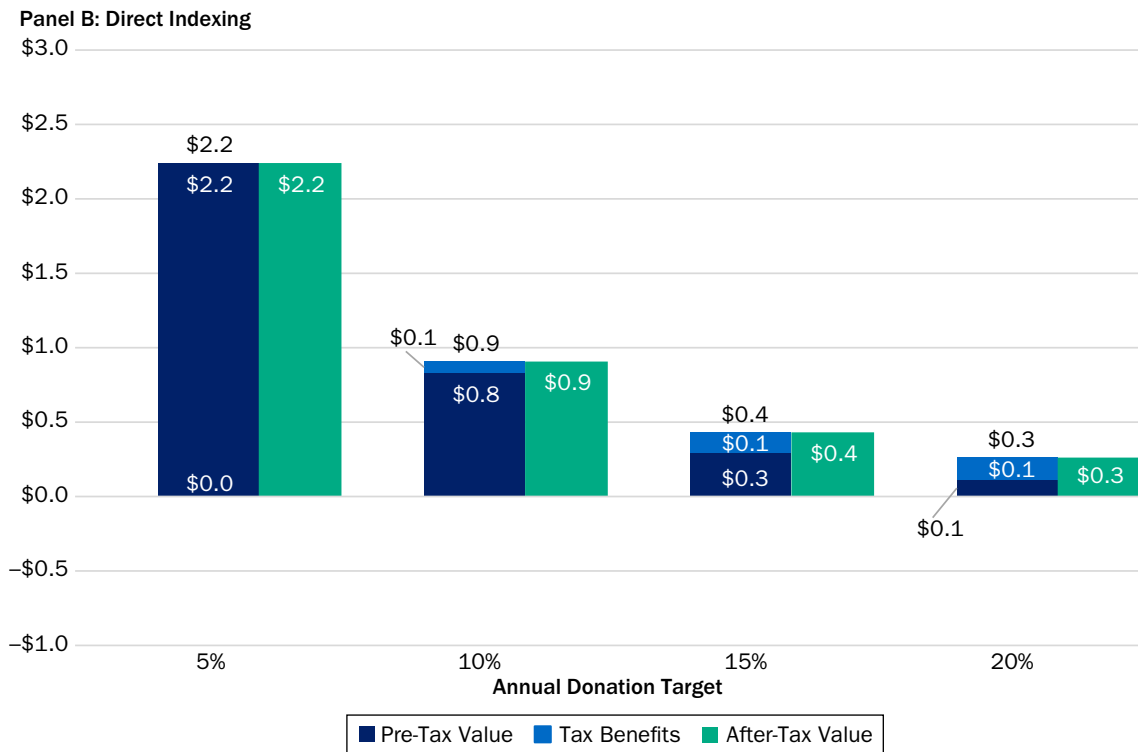
After-Tax Value of an Account Used for Charity per \$1 Invested for Donations without Replenishment, End of a 20-Year Investment Period



(continued)

EXHIBIT 6 (continued)

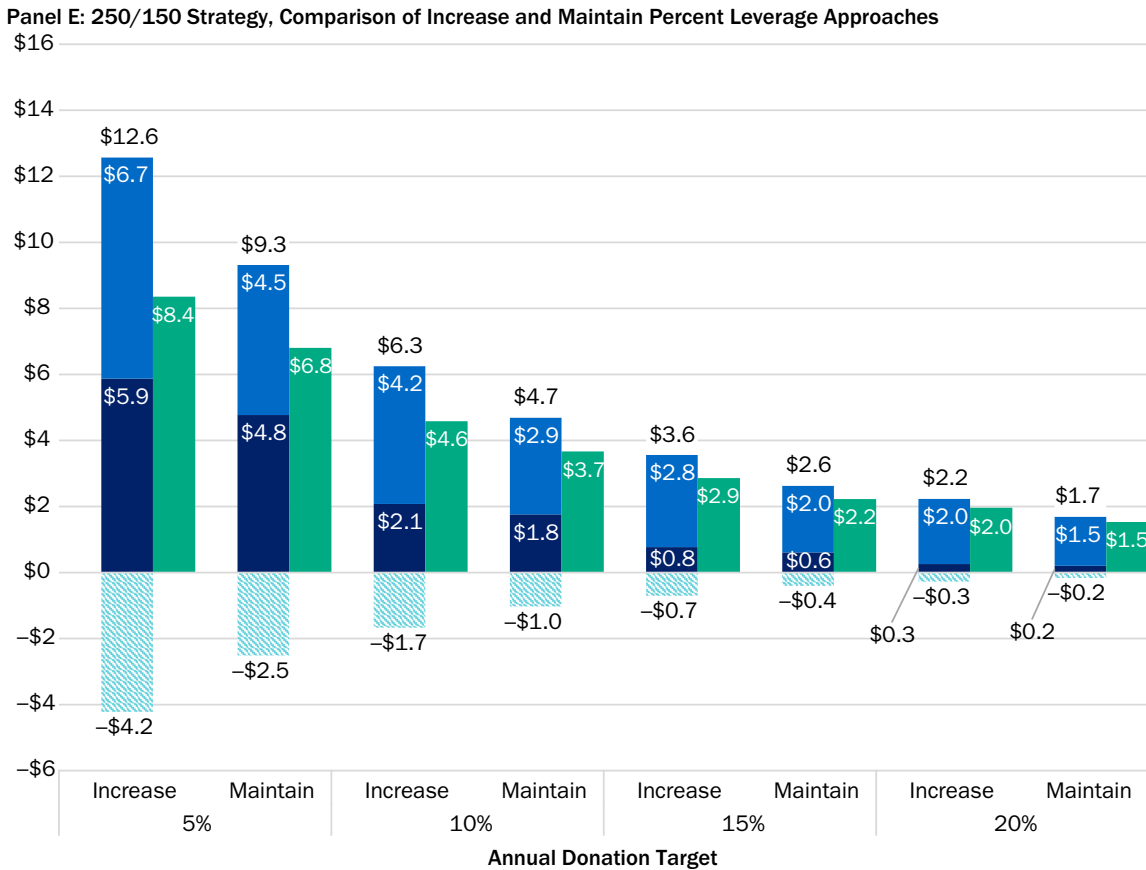
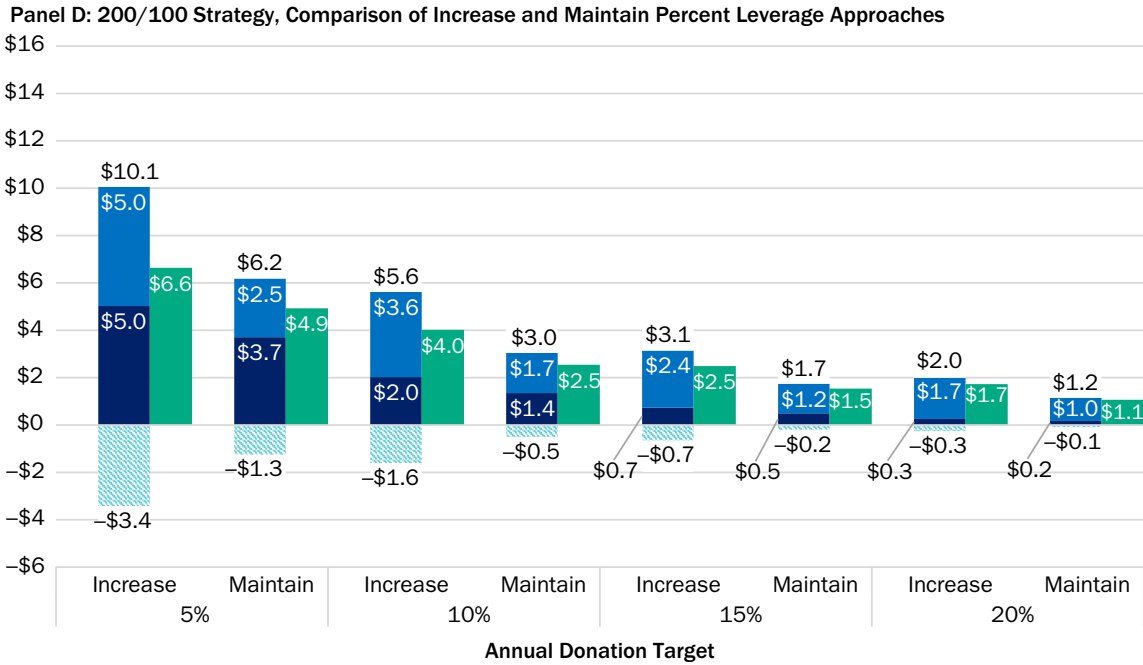
After-Tax Value of an Account Used for Charity per \$1 Invested for Donations without Replenishment, End of a 20-Year Investment Period



(continued)

EXHIBIT 6 (continued)

After-Tax Value of an Account Used for Charity per \$1 Invested for Donations without Replenishment, End of a 20-Year Investment Period



■ Pre-Tax Value ■ Tax Benefits ■ Transition to Long-Only Tax Cost ■ After-Tax Post-Transition Value

the reduction in the NAV of the strategy (with larger donations leaving less capital invested): As we can see from Exhibit 6, at the 20% donation target, after 20 years, the pretax value achieved with the index investment declines to around \$0.1 for every \$1 invested. In addition, donations of stock allow the index investment to significantly reduce net capital gain recognition, as can be seen in Exhibit B1.

The direct-indexing strategy without replenishment realizes much smaller cumulative tax benefits than when stock donations are replenished with cash (compare, for example, the 20% target in Exhibits 5 and 6). The tax awareness of the strategy, however, allows it to achieve tax benefits even when its NAV declines significantly. Even when donations are done without replenishment, the tax benefits of direct indexing are higher than in the no-donations case shown in Exhibit 5.

The tax benefits of direct indexing particularly stand out in comparison with the passive index investment. For example, at a 5% annual donation target, the passive index realizes a cumulative tax liability of \$0.5 for every \$1 invested, whereas direct indexing realizes no tax liability, thus providing the investor with a cumulative tax benefit of \$0.5 in excess of the passive index. At the 20% target, the passive index realizes a cumulative tax liability of \$0.2 for every \$1 invested, whereas direct indexing realizes a cumulative tax benefit of \$0.1, which translates to a cumulative tax benefit of \$0.3 in excess of the passive index.

The results in Exhibit B1 in Appendix B allow us to understand why cumulative tax benefits of the direct indexing strategy are preserved even as the strategy's NAV declines significantly with the increase in donation target. As can be seen in Exhibit B1, for all annual donation targets from 5% to 20%, donations allow the direct indexing strategy to realize almost the same amount of cumulative net capital loss as in the no-donations scenario. This is despite the fact that in the no-donations scenario, the NAV grows to \$5.7 for every \$1 invested (see Exhibit 5), whereas for the donation target of 5%, the NAV grows to only \$2.2, and for donations of 10%, 15%, and 20%, the NAV actually declines to \$0.8, \$0.3, and \$0.1, respectively. As a result of the shrinking NAV, the tax burden of dividend income declines, whereas the tax benefit derived from capital losses remains almost unchanged,¹⁵ leading to an increase in the tax benefit net of the cost of dividend tax.

The long–short strategies have one important advantage over long–only investments, such as a passive index or direct indexing. Within limits, by increasing their percent leverage, they can retain the dollar size of their positions even as their NAV shrinks. Consider, for example, a donation of 20% of the NAV without replenishment from a portfolio with a NAV of \$100. If the donation is made from a long–only portfolio, the value of portfolio positions is reduced from \$100 to \$80. Now consider a long–short strategy that is 200% of the NAV long and 100% of the NAV short—what we call a 200/100 strategy. With a \$100 NAV, when the donation of \$20 is made from the long leg of the strategy portfolio, the remaining value of the long is \$180, and the value of the short is \$100. After positions worth \$20 leave the portfolio, the NAV of the portfolio is \$80. The investor now has a choice between two options. One is keeping the dollar leverage at \$180 long and \$100 short. This increases the percent leverage to 225% ($= 180/80$) of the NAV long and 125% ($= 100/80$) of the NAV short, effectively turning the strategy from 200/100 on a higher NAV to 225/125 on a lower NAV. The other option is maintaining the percent leverage fixed at 200/100 and thereby reducing the value of the long positions to \$160 ($= \$80 \times 200\%$) and the short positions to \$80 ($= \$80 \times 100\%$). In our simulations, for the first option, we allow the percent leverage to increase to the maximum of 300/200 relative to the NAV.

¹⁵The intuition for why the tax benefit derived from capital losses remains almost unchanged despite donations without replenishment is that appreciated donated stocks are unlikely to become candidates for loss realization in the future.

We keep the TE consistent with leverage. If the percent leverage is allowed to increase, so is percent TE. For example, for a 200/100 strategy with a \$100 NAV, the initial percent TE is 4% and the initial dollar TE is \$4. After a 20% donation from the strategy portfolio, if the dollar leverage in the extensions is kept at \$100 long and \$100 short (corresponding to a total leverage of \$180 long and \$100 short), then the TE is also kept at \$4, which implies that the percent TE increases to 5% ($= \$4/\80). Consistent with the percent leverage being capped at 300/200, percent TE is capped at 8%.

Exhibit 6 allows us to compare terminal value levels achieved by an investor in long–short strategies to those achieved with traditional long–only investments (a passive index and direct indexing). First, irrespective of the donation target, the pretax alpha of long–short strategies helps the investor obtain a higher level of pretax value than the two long–only strategies. Second, allowing the leverage to increase up to the 300/200 limit gives the investor a higher exposure to the alpha model and thereby helps the investor achieve an even higher level of pretax alpha than when the percent leverage and TE are held constant. Furthermore, even though the tax cost of transition to long–only increases when leverage is allowed to increase, the cumulative tax benefits achieved over the life of the investment more than compensate the investor for bearing this higher transition cost.

To understand the patterns in cumulative tax benefits observed in Exhibit 6, in Exhibit B1 in Appendix B, we show the evolution of cumulative net capital losses under the two alternative scenarios in which we: (1) allow the percent leverage and TE to increase up to the 300/200 and 8% limit, respectively, and (2) keep the percent leverage and TE fixed. Generally, the flexibility to increase leverage and TE leads to higher cumulative net capital losses than when the percent leverage and TE are fixed. When the leverage is allowed to increase to the 300/200 limit, this limit is reached by different strategies at different times. For example, 150/50 reaches the aforementioned leverage constraint in Years 9, 11, and 15 when the donation target is 20%, 15%, and 10%, respectively. When the donation target is 5%, the 150/50 strategy does not reach the constraint within our 20-year simulation period. The 200/100 strategy reaches the constraint in Years 5, 6, 9, and 15 for donation targets of 20%, 15%, 10%, and 5%, respectively. The highest leverage 250/150 strategy reaches the 300/200 constraint in Year 4 for the 20% and 15% donation targets, and in Years 6 and 7 for donation targets of 10% and 5%, respectively.

The combination of pretax alpha and tax benefits makes the long–short strategies a far better option than the two long–only investments, even when the investor is planning to transition to a long–only portfolio at the end of the 20-year investment period. The terminal post-transition value with long–short strategies is a multiple of that with the long–only investments. The results at the 20% donation target are particularly noteworthy. At this high donation target, for every \$1 invested, at the end of the 20-year period, the investor is left with close to \$0 by investing in a passive index, and \$0.3 by investing in direct indexing. Investing in 150/50 and allowing the leverage to drift up to 300/200 leaves the investor with \$1.3 per every \$1 invested. That is, despite donating 20% of the strategy portfolio NAV every year for 20 years, the investor is still left with more personal value than the initial contribution to the strategy. This post-transition value level increases to \$1.7 and \$2.0 per \$1 invested for the 200/100 and 250/150 strategies. Even when the percent leverage and TE are kept fixed, the investor is still better off with long–short strategies. At the 20% donation target, the 150/50 strategy yields \$0.6, which is double that of direct indexing, whereas 200/100 and 250/150 leave the investor with \$1.1 and \$1.5, respectively, for every \$1 initially contributed to the strategy.

CONCLUSION

Recent studies have demonstrated the benefits of tax-aware long–short factor strategies for taxable investors. The topic of combining these strategies with charitable giving, however, has not been explored yet in the literature. Since charity is one of the central themes in wealth planning for affluent families, it is pertinent to ask whether charitable families can derive additional benefits from long–short investing.

In the introduction, we set out four hypotheses that we test throughout the article. First, we demonstrate that long–short strategies have a significantly higher *donation capacity* than long–only investments, and that donation capacity increases with leverage. As the leverage of the long–short strategy increases, the value of positions available for donation also increases relative to the capital invested in the strategy. This allows highly charitable families to increase the amount of donations made with stocks.

Second, we show that *donation efficiency* also increases with leverage. Since the value of appreciated positions increases with leverage, leverage creates opportunities for donating stocks with larger built-in gains for a given donation target.

A higher donation capacity combined with a higher donation efficiency means that more of the built-in gain is removed from the strategy portfolio via donations of appreciated stock. From a tax perspective, removing more built-in gains leads to two benefits. First, it creates a substantial *loss-realization boost* that increases with leverage and the donation target. Second, by reducing the cost of changing the strategy portfolio, it increases the *flexibility* of modifying the strategy portfolio—for example, from long–short to long–only. We find that higher-leverage portfolios experience both a higher loss-realization boost and a greater reduction in portfolio transition tax costs. This provides support for our third and fourth hypotheses.

Combining all the previously mentioned findings, we show that the cumulative after-tax value derived from investment strategies increases in both the leverage and donation target. Higher leverage strategies give access to both higher pretax alpha and higher tax benefits, thereby increasing the after-tax value, and higher levels of donation help increase tax benefits even further. Importantly, there is an interaction effect whereby tax benefits derived from donations increase with leverage.

Finally, in the penultimate section, we consider donating stock without replenishment. In this case, long–short strategies have the additional benefits that dollar sizes of positions do not have to be reduced upon donations because the percent leverage can be increased. This gives an additional boost to both the pretax alpha and the tax benefits derived from loss realization, which provides support to the corollary we postulated in the introduction.

Whether the percent leverage is allowed to increase or is kept constant, we find that when stocks are donated without replenishment, long–short strategies continue to significantly dominate long–only investments in terms of after-tax value. The after-tax value derived from long–short strategies increases with leverage thanks to both a greater pretax appreciation and higher cumulative tax benefits.

In summary, our findings suggest that affluent families with significant philanthropic objectives may derive considerable benefits from employing long–short tax-aware factor strategies in conjunction with charitable giving. Families planning on doing good should consider leveraging up.

APPENDIX A

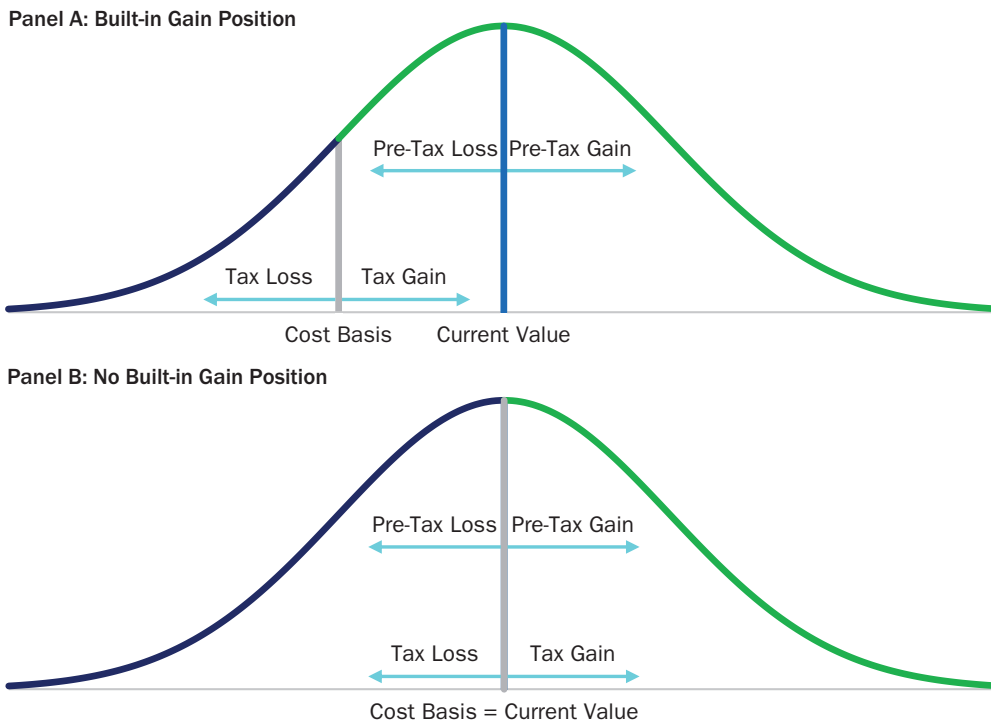
DONATING STOCK VERSUS DONATING CASH

In this appendix, we will only consider US federal taxes. For simplicity of exposition, we only compare donations made entirely with stock or entirely with cash and ignore the fact that the donor can donate a mix of stock and cash that maximizes the value of charitable deduction. We also ignore other complexities such as the ability of the donor to elect to treat long-term capital asset donation as cash donation,¹⁶ which increases the limit on the deduction but reduces the value of the deduction from fair market value of the asset to its cost basis.

First, it is instructive to visualize the implications of built-in gains. Consider Exhibit A1. Panel A shows a stylized symmetric distribution of the future value of a stock position. The current value is at the center of the distribution, and the cost basis is below the current value, with the difference between the two being the built-in gain. Future values to the left (right) of the current value reflect pretax loss (gain). Similarly, future values to the left of the cost basis (represented by the blue segment of the bell curve) result in a tax loss, whereas future values to the right of the cost basis (represented by the green segment of the bell curve) result in a tax gain. As seen in the chart, the position can experience a pretax loss, but as long as the future value is above the cost basis, liquidating the position would still result in a tax gain. The relatively small area below the blue segment of the bell curve means that the probability of realizing a future tax loss on a built-in-gain position is low. In contrast, the probability of realizing a future tax gain, as indicated by the area below the green segment of the bell curve, is high.

EXHIBIT A1

The Implications of Built-in Gains for Realizing Tax Gains and Losses



¹⁶ IRC Section 170(b)(1)(C)(iii).

Panel B in Exhibit A1 shows a stock position in which the cost basis is equal to the current value. For example, this could be a position newly acquired with cash.¹⁷ Note that in this case, in our stylized example, the stock is equally likely to realize a tax loss or a tax gain in the future. This means that replacing a built-in-gain position (Panel A) with a no-built-in-gain position (Panel B) increases the likelihood of realizing future tax losses and reduces the likelihood of realizing future tax gains, even when the distribution of pretax returns might remain unchanged. The increase in the likelihood of realizing a tax loss creates tax benefits for the investor.

With this result in mind, let's assume that the stock positions have been held for more than one year and therefore are treated as long-term positions. Let V be the positions' value, B be the positions' basis, and D_S and D_C be the tax benefit of donating stock and cash donations, respectively. Let A be the stock owner's adjusted gross income (AGI) and let θ_S and θ_C be the charitable deduction limits as a percentage of AGI for stock and cash donations, respectively. Let t_i be the statutory tax rate applicable to income. Let t_E be the effective tax rate on unrealized gain of a stock position. This rate reflects the present value of expected future tax liability from recognizing long-term capital gain on the stock. Let t_B be the tax benefit rate that represents the present value of expected future tax benefits resulting from replacing \$1 of low-basis (appreciated) positions with \$1 of newly acquired positions (see the example in Exhibit A1). Finally, let Ξ be an indicator variable equal to 1 if the donated stocks are replaced with cash (which is immediately used to acquire new positions), and 0 if the stocks are donated without replacement.

The current-year tax benefit of donating stocks is given by:

$$D_S = \min(V, \theta_S A) t_i + (V - B) t_E + \Xi (V - B) t_B \quad (A1)$$

where the first term is the tax benefit of charitable deduction, the second term represents the benefit of reduction in built-in capital gains (BIGs), and the last term stands for the additional tax benefit that could be achieved if the donated low-basis stocks are replaced with an equivalent amount of newly acquired stocks. The current-year tax benefit of donating cash of the same value V is given simply by the tax benefit of charitable deduction:

$$D_C = \min(V, \theta_C A) t_i \quad (A2)$$

Note that under the Internal Revenue Code (IRC) Section 170(b)(1), individuals can deduct up to 50% of AGI for cash donations and up to 30% of AGI for stock donations.¹⁸ As a result, historically, θ_C has been significantly higher than θ_S .

Further, under Section 170(b)(1), charitable contributions that exceed the deduction limits can be carried forward for only five years. In each of the subsequent five years, the deduction will be subject to the same percentage limits: 50% of AGI (or, alternatively, the temporarily increased percentage of 60% under the TCJA) for cash donations and 30% of AGI for stock donations.

When the value of donation is small relative to AGI—for example, when $V \leq \theta_S A < \theta_C A$ —Equations A1 and A2 become:

$$D_S = V t_i + (V - B) t_E + \Xi (V - B) t_B \quad (A3)$$

and

$$D_C = V t_i \quad (A4)$$

¹⁷Note that even for newly acquired positions, the cost basis is not always equal to the value. For example, if a wash-sale adjustment under IRC Section 1091 were made, the adjusted cost basis would differ from the position value even at the time of acquisition.

¹⁸Technically, IRC Section 170(b)(1) sets the limits as a percentage of “contribution base,” which is defined in IRC Section 170(b)(1)(H) as “adjusted gross income (computed without regard to any net operating loss carryback to the taxable year under section 172).” Also, see Footnote 8 in the main text for further details on charitable deduction limitations.

By subtracting A4 from A3, we can see that for stocks with BIGs, that is, $V > B$:

$$D_s - D_c = (V - B)t_E + \Xi(V - B)t_B \quad (A5)$$

That is, when the current-year value of donation is sufficiently small in comparison to AGI, donating stocks is more beneficial than donating cash.

The benefit from donating stocks is not necessarily higher than that from donating cash when the value of the donation becomes large relative to AGI. Let's consider such scenarios in more detail. It is evident from Equation A1 that the tax benefit of donating stock positions increases with the magnitude of their BIGs, that is, $V - B$. We can thus calculate the upper and lower bounds on this benefit by setting $B = V$ and $B = 0$, respectively.¹⁹ This leads to the following equations for the upper and lower bounds, respectively:

$$D_{S,LB} = \min(V, \theta_s A)t_i \quad (A6)$$

$$D_{S,UB} = \min(V, \theta_s A)t_i + V(t_E + \Xi t_B) \quad (A7)$$

Let's represent the tax benefit of charitable deduction in Equations A6, A7, A1, and A2 as a fraction of the value of the donation:

$$\frac{D_{S,LB}}{V} = \min\left(1, \theta_s \frac{A}{V}\right)t_i \quad (A8)$$

$$\frac{D_{S,UB}}{V} = \min\left(1, \theta_s \frac{A}{V}\right)t_i + t_E + \Xi t_B \quad (A9)$$

$$\frac{D_s}{V} = \min\left(1, \theta_s \frac{A}{V}\right)t_i + \frac{V - B}{V}(t_E + \Xi t_B) \quad (A10)$$

$$\frac{D_c}{V} = \min\left(1, \theta_c \frac{A}{V}\right)t_i \quad (A11)$$

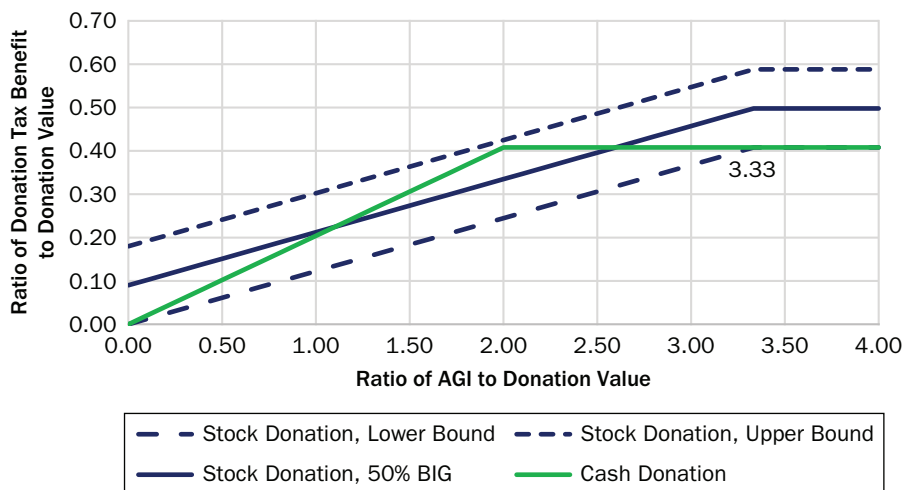
Note that for the purpose of comparing stock donation to cash donation, Ξ in Equation A9 can be set to 1. This is because the donor has a choice between two options. Option one is to contribute cash to the charity. Option two is to put cash into the stock portfolio, contribute to the charity appreciated stocks of the same value as cash, and use cash in the portfolio to purchase new positions. In option two, the appreciated stock positions will be removed from the portfolio and replaced with new positions of the same value, which, in turn, has the potential to be liquidated at a loss in the future (as seen in the example in Exhibit A1).

In Exhibit A2, we plot the ratios defined by Equations A8, A9, A10, and A11 as a function of the ratio of AGI to donation value, $\frac{A}{V}$. We assume that t_i is equal to 40.8%, representing the top bracket federal income tax in 2024, including the net investment income tax, and that t_E is equal to 10% (see, for example, Sosner, Gromis, and Krasner 2022). We estimate the present value of the tax benefit rate to be 8%. For θ_s and

¹⁹ Although the position can have a built-in loss, in that case, it is better to recognize the loss by liquidating the position and then donate the cash proceeds of liquidation. This way, the investor would benefit from both a capital loss and a charitable deduction.

EXHIBIT A2

Tax Benefit of Donating Stock versus Tax Benefit of Donating Cash as a Function of the Ratio of AGI to Donation Value



θ_c , we use the values of 30% and 50%, respectively, as described earlier. For Equation A10, we assume that the BIG, represented by the ratio $\frac{V-B}{V}$, is 50%.

As can be seen in Exhibit A2, when the ratio of AGI to donation value exceeds 3.33 to 1, that is, greater than 1 divided by 30%, any additional benefits associated with avoiding the realization of capital gains on the stocks, or with additional future tax benefits from replacing the appreciated stocks with new positions, make donating stock more beneficial than donating cash.

When the ratio of AGI to donation value is lower than 3.33, the attractiveness of stock donation relative to cash donation depends on tax rates— t_i , t_E , and t_B —and on the BIG of the stocks. Under our assumptions about parameter values, when BIG is 100% (see the upper bound in Exhibit A2), donating stocks is still strictly better than donating cash. For lower levels of BIG, however, when the ratio of AGI to donation value is in the proximity of 2, donating cash might be better. For example, when the stock’s BIG is 50%, donating cash is preferable for an AGI-to-donation ratio between approximately 1.1 to 2.6. In fact, it is clear from Exhibit A2 that the advantage of donating cash relative to donating stocks is maximized around the AGI-to-donation ratio of $\frac{1}{\theta_s}$, or alternatively at the donation-to-AGI ratio of θ_s .

APPENDIX B

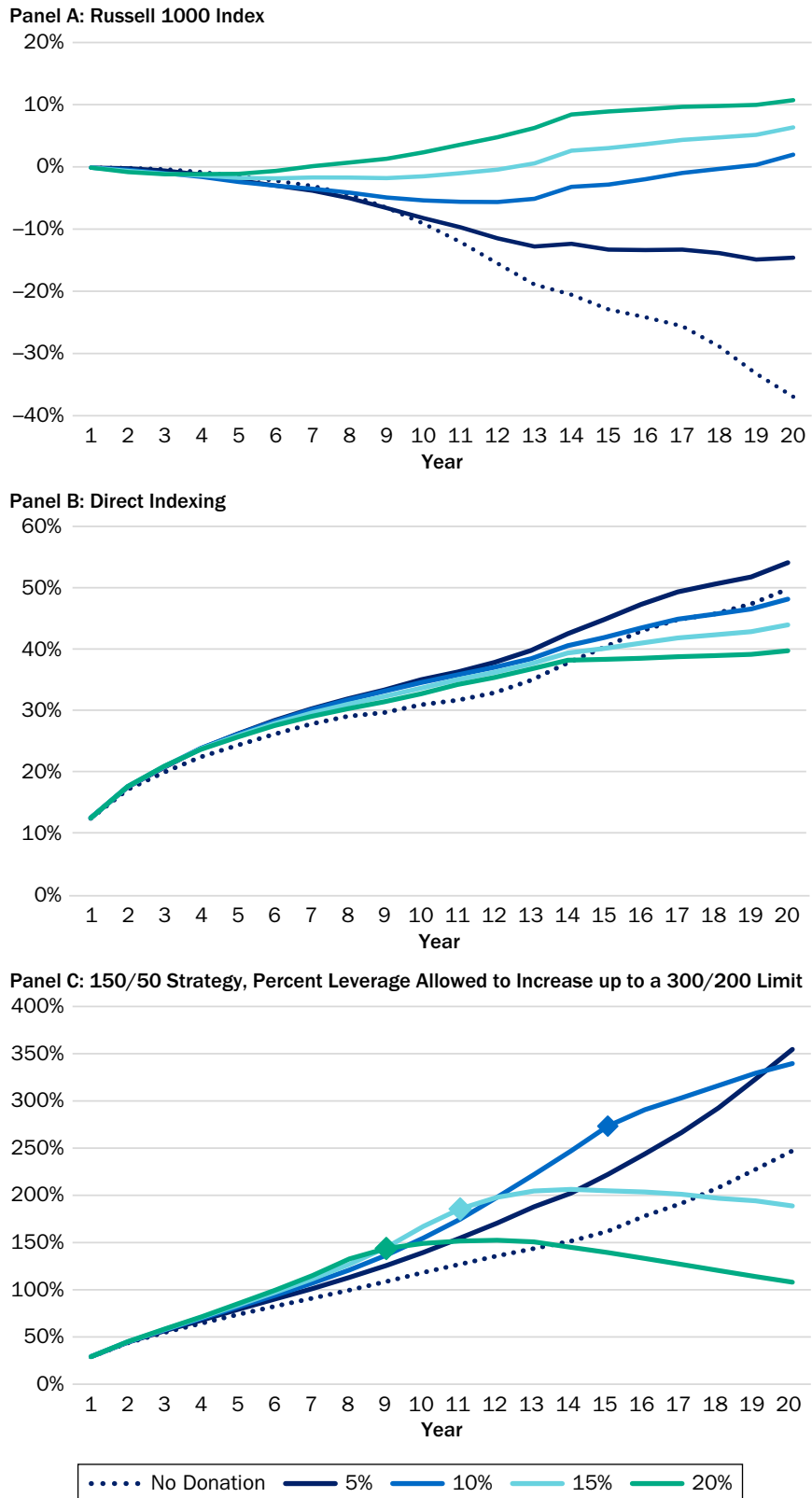
CUMULATIVE NET CAPITAL LOSSES FOR DONATION-WITHOUT-REPLENISHMENT SCENARIOS

Following Liberman et al. (2023), we compute cumulative net capital losses as a percentage of initially invested capital. That is, to obtain a cumulative percentage loss at a given point in time, we cumulate dollar net capital losses up to that point in time and then divide the cumulative dollar loss by the dollars of starting capital.

We model annual donation-without-replenishment targets of 5%, 10%, 15%, and 20% of the strategy NAV. For long–short strategies, we consider two scenarios. In the first scenario, percent leverage and TE are allowed to increase up to the limit of 300/200

EXHIBIT B1

Cumulative Net Capital Loss (gain) as a Percentage of the Initial Investment Value by Donation Target Ranging from No Donation to 20%

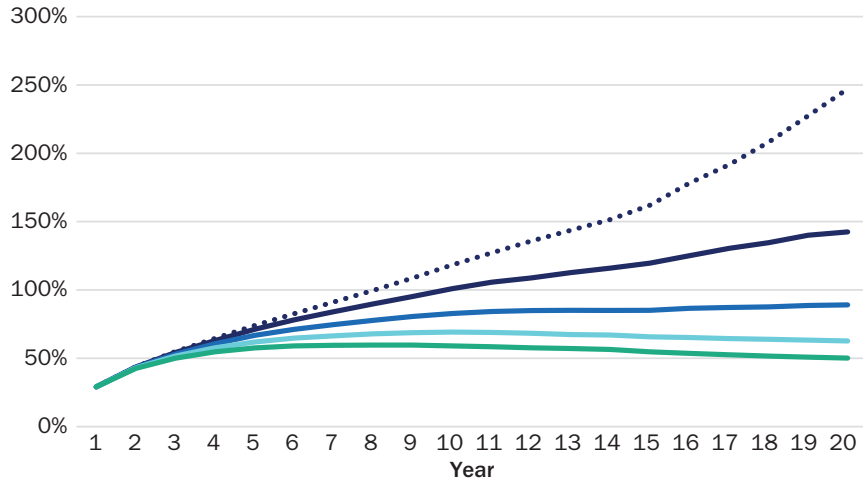


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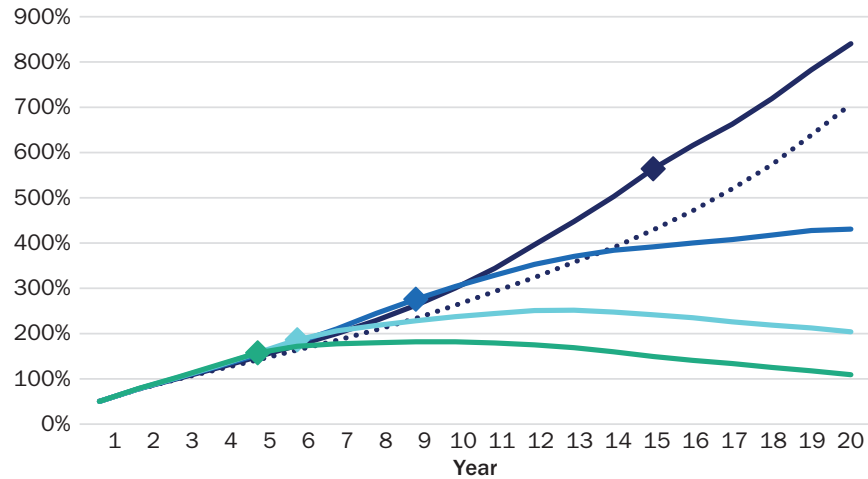
EXHIBIT B1 (continued)

Cumulative Net Capital Loss (gain) as a Percentage of the Initial Investment Value by Donation Target Ranging from No Donation to 20%

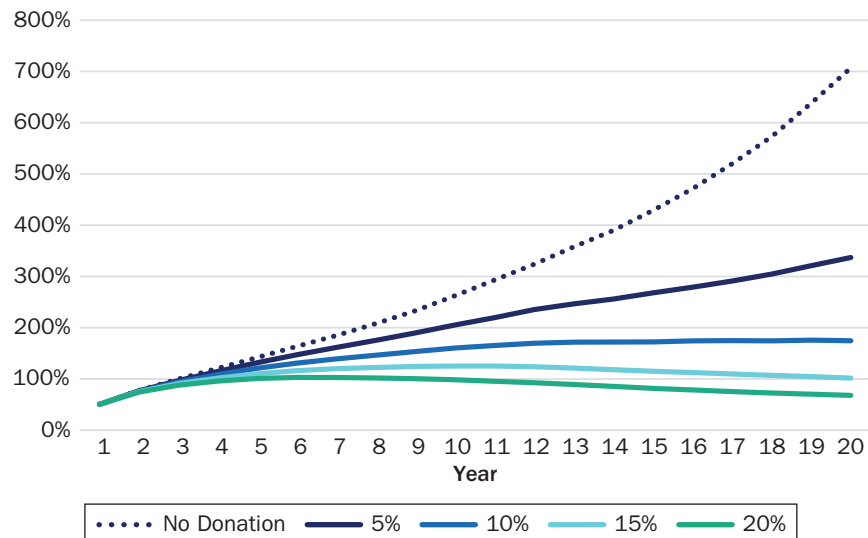
Panel D: 150/50 Strategy, Percent Leverage is Maintained at the Initial Target Level



Panel E: 200/100 Strategy, Percent Leverage Allowed to Increase up to a 300/200 Limit



Panel F: 200/100 Strategy, Percent Leverage is Maintained at the Initial Target Level



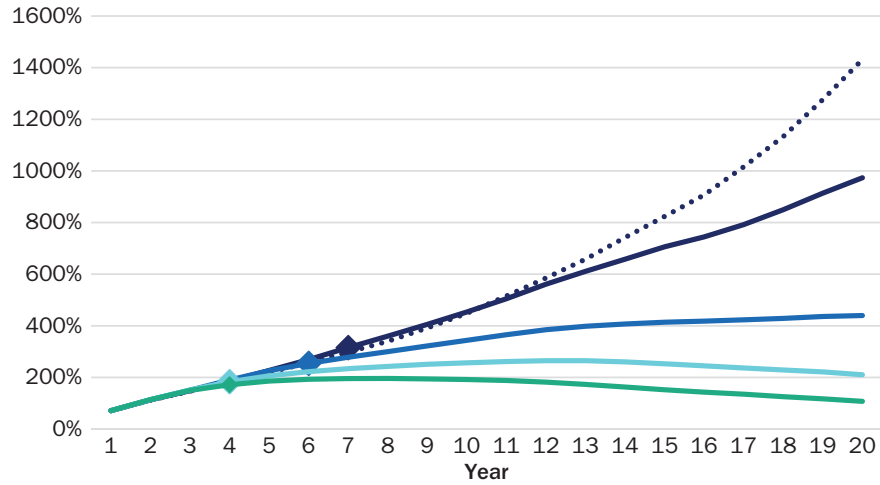
..... No Donation — 5% — 10% — 15% — 20%

(continued)

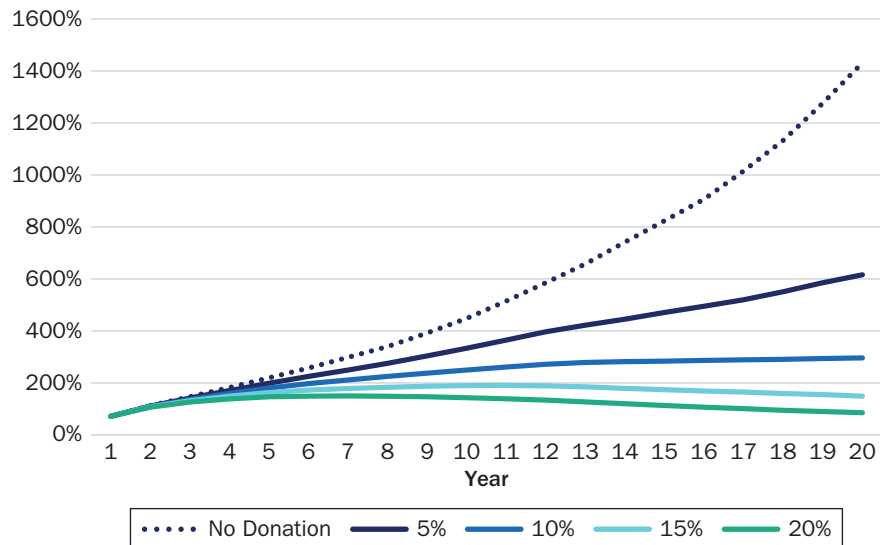
EXHIBIT B1 *(continued)*

Cumulative Net Capital Loss (gain) as a Percentage of the Initial Investment Value by Donation Target Ranging from No Donation to 20%

Panel G: 250/150 Strategy, Percent Leverage Allowed to Increase up to a 300/200 Limit



Panel H: 250/150 Strategy, Percent Leverage is Maintained at the Initial Target Level



and 8%, respectively. In the second scenario, percent leverage and TE are maintained at their initial level.

For comparison, a dotted line shows cumulative net capital losses for a zero-donation target. The diamond markers indicate the year when the 300/200 limit on leverage is reached.

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