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Divest, Disregard, or Double Down?

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Abstract

How should a philanthropic endowment invest in a firm whose activities run counter to the charitable missions the endowment funds? Standard strategies involve disregarding the objectionable nature of or divesting from such firms. However, doubling down on the investment may be optimal if firm returns increase with activities the endowment combats. This mission hedging strategy increases expected utility by making more funds available when they are needed most. This paper formalizes the endowment's optimization problem, identifies investment trade-offs, explores optimality conditions of each strategy, and examines related evidence. Bad actors can provide good opportunities to hedge mission-specific risks.

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How should a philanthropic foundation’s endowment invest in a firm whose activities run directly counter to the charitable missions the endowment funds? Any foundation seeking to combat, reduce, or eliminate something like pollution, tobacco consumption, gun violence, child labor, or nuclear power that can be tied to the activities of a firm must answer this question. Universities and colleges considering investments in sectors which relate to their research, policy, or teaching focuses may also face this question.¹ With ethicists, legal scholars, investors, journalists, governments, activists, universities, and foundation and endowment managers all weighing in, two main opposing strategies have emerged: socially responsible investing (SRI), which calls for divestment of objectionable assets, and the “firewall” approach of disregarding the objectionable nature of firms in investment decisions.² In this paper I present a new strategy, which I call “mission hedging,” wherein the endowment doubles down on its investment in the firm it opposes. If increased objectionable activities coincide with both higher firm returns and greater foundation needs for revenue (to counteract the firm’s activities), then greater exposure to the firm aligns funds available with funds needed. This creates a hedge around

¹There are some differences in tax treatment of college and university foundations and endowments which are not important from the perspective of this paper.

²Shareholder activism is an alternative middle-ground approach in which investments are used to submit and vote on shareholder proposals that influence firms directly. Due to Securities and Exchange Commission rules, a foundation only has to own \$2000 in market value of the firm’s securities (continuously for one year) in order to submit a proposal to be voted on by all shareholders. (U.S. Security and Exchange Commission (1998)). Thus shareholder activism would be an additional benefit of investing in a firm but is not expected to motivate a large investment level.

Consider the example of People for the Ethical Treatment of Animals (PETA), which sought to submit activist shareholder proposals. It purchased just \$2274 worth of shares in SeaWorld in April 2013 along with additional shares the next year after prices declined (Smith (2013), Sweatte (2014)).

the foundation’s mission and maximizes its expected utility.

Classic arguments in the divestment debate are as follows. SRI proponents divest to advance their missions directly through investing (Kramer and Cooch (2007)). By excluding objectionable firms from their portfolios, foundations avoid showing implicit support for the firms or benefiting from tainted profits, make political statements bringing attention to important issues, and potentially exert downward price pressure on stocks to influence firm behavior.³

Firewall foundations instead disregard interactions between their missions and firms, keeping a figurative firewall between investing and grantmaking and other operations. They task money managers with maximizing risk-adjusted financial returns that yield the largest possible operating and grantmaking budgets with which to directly do good works. Firewall advocates believe that any divestment benefits – of which they are often skeptical – are outweighed by the costs, which include lower risk-adjusted returns from choosing investments based on non-financial factors, higher risks from a less diversified portfolio, and the additional administrative burdens of implementation.⁴

Unfortunately, these approaches both ignore covariance between a firm’s fi-

³Casual conversation with non-economists suggests that some people mistakenly believe that spending money to buy shares in a company (even on the secondary market) is equivalent to giving the company that money. A more sophisticated view that stock purchases can lower a company’s borrowing cost or reward executives through increasing stock option value, however, can lead to similar concerns. Evidence for this is discussed in section III.A

⁴Other relevant concerns have historically included that due to potentially lower financial returns, foundation managers’ fiduciary duties might prohibit them from engaging in divestment activities. American legal scholars have examined this question and argue that it is at the very least legally acceptable for trustees to engage in social investing and perhaps the prudent course (Solomon and Coe (1997a), Solomon and Coe (1997b), and McKeown (1997)). Recently students sued Harvard University over its failure to divest, claiming that fossil fuel investments violated fiduciary duties. The suit was dismissed by the court (Klein and Delwiche (2015).)

nancial returns and activities related to the foundation's mission. The mission hedging strategy leverages this covariance by skewing investment toward the firm, making the foundation's mission outcome more certain much as traditional hedging makes financial outcomes more certain. Thus some endowments will want higher than normal exposure to stocks that reward the behaviors the foundation is fighting. For example, a lung cancer-fighting foundation benefit from investing even more heavily in tobacco than a standard portfolio would.

This paper relates to a number of strands in the literature. Public finance scholars incorporate covariance in social project valuations. For example, Hirshleifer (1966) argues that one must account for funds being valued more in some states than others when evaluating government projects under uncertainty. Minken (2008) shows that the risk premium component of discount rates for public project cost benefit analyses depends on the covariance of project returns with returns on all national assets. On the corporate and personal finance side, the Consumption Capital Asset Pricing Model (C-CAPM) builds on the basic CAPM to allow expected return to decrease with covariance between asset returns and marginal utility of consumption (Blanchard and Fisher (1989), p. 507-508). Others have also proposed hedging on non-purely financial dimensions. For example, Wolfers and Zitzewitz (2006) suggest that individuals use prediction markets to hedge personal risks. Particularly, an individual could bet on a candidate whose election might increase the individual's risk of job loss. However, no one has presented a formal model of this mechanism or the trade-offs involved. The literature on divesting as an SRI strategy for philanthropic endowments has largely focused on surveying

or advocating for (or against) the practice (see McKeown (1997), Wood and Hagerman (2010), Emerson (2003), and Kramer and Cooch (2007)). I present a formal model of the endowment optimization problem and use the CAPM to clearly decompose the trade-offs of hedging around idiosyncratic risk, filling two gaps in the literature.

I start by presenting a basic model of a foundation (or educational institution) that seeks to reduce a “bad” activity level and chooses how to allocate its endowment given assets’ random return distributions and known subjective levels of “evil.” After the investment is made, an exogenous shock simultaneously affects the bad activity level and asset returns. The foundation then spends its endowment to reduce the activity that it considers an economic bad.

I examine how a marginal shift in portfolio weights between two assets changes expected utility. I use the Capital Asset Pricing Model (CAPM) to decompose the effects of this shift into a set of trade-offs between expected returns, exposure to market-wide risk, and an idiosyncratic risk component. This final component (typically minimized through diversification) increases expected utility when endowment managers increase portfolio weights on firms whose returns correlate with activities the foundation seeks to reduce. In particular, a foundation with decreasing marginal utility or a proportional intervention technology can increase expected utility by skewing investment toward the firm, yielding second order stochastic dominance.

Despite the potential mission hedging benefits, foundations do not generally skew investments toward objectionable firms. To see why, I model the optimization problems implicitly solved by the SRI and firewall strategies. I

allow portfolio evil levels to directly change fundraising, pre-intervention bad activity levels, and utility. I also assume that firm returns are independent of bad activity levels. I relax this assumption again to establish a comprehensive mission hedging model. I end by examining evidence for the comprehensive model trade-offs. I find little consensus on magnitudes, which depend on factors like endowment size, firm fundamentals, and foundation funding. I conclude that while mission hedging must be evaluated on a case-by-case basis, there will be foundations for whom the strategy is optimal.

To understand what is at stake, consider that more than 90,000 U.S. private foundations own over \$640 billion in combined assets (Internal Revenue Service (2011)), while non-profit colleges and universities manage over \$500 billion in assets (Berner (2015)). Foundations and universities with environmental focuses have recently joined the fossil fuel divestment movement, which now exceeds \$50 billion in committed assets (Goldenberg (2014) and Wines (2014)).

The remainder of the paper is structured as follows. Section I lays out the basic mission hedging model, identifying trade-offs in the investment decision and demonstrating conditions under which skewing investments toward objectionable firms is optimal. Section II adds assumptions and elements consistent with the divestment and firewall strategies and presents a comprehensive mission hedging model. Section III explores the theoretical and empirical evidence related to the trade-offs. Section IV discusses market reactions and potential feedbacks from mission hedging. Section V concludes with summary remarks.

I. Mission Hedging Model

I consider a foundation established with a mission to reduce or eliminate some bad activity, the initial level of which is denoted by b_0 .⁵ This foundation begins with initial endowment a_0 , which it invests as it chooses in a set of assets. The world then experiences a shock which simultaneously affects the bad activity level (now b_1) and asset returns, yielding endowment value a_1 . After the state of the world has been revealed and the endowment has earned its returns, the foundation spends a_1 on its intervention to reduce b_1 .

In investing its endowment, the foundation chooses an asset allocation consisting of a set of weights $\alpha = \{\alpha_i\}$ for each possible asset i , where an asset may be an individual security or a collection of securities like a fund. It must always hold that

$$\sum_{i=1}^n \alpha_i = 1. \quad (1)$$

Each asset is characterized by the distribution of its random return r_i and a measure of evil e_i , a known static scalar that is subjectively determined by the foundation.⁶ Thus an endowment's portfolio return (r_p) and evil level (e_p)

⁵I will use the term foundation throughout the remainder of this analysis. However, as described in the introduction, the results apply to other entities like some educational institutions.

⁶The same asset allocation may be considered evil by one foundation and good by another. For example, a foundation opposed to abortion would consider an abortion pill producer objectionable, while a pro-reproductive rights foundation might favor it.

are:⁷

$$r_p = \sum_{i=1}^n \alpha_i r_i \quad \text{and} \quad e_p = \sum_{i=1}^n \alpha_i e_i. \quad (2)$$

The foundation spends its assets on an intervention. I model this intervention technology as

$$y(a_1, b_1) = b_2. \quad (3)$$

where a_1 and b_1 are post-shock, pre-intervention endowment and bad activity levels, respectively, and b_2 is the final bad activity level. This intervention has the following derivatives:

$$\begin{aligned} \frac{dy}{da_1} &< 0, \quad \frac{d^2y}{da_1^2} > 0, \\ \frac{dy}{db_1} &> 0, \quad \frac{d^2y}{db_1^2} \leq 0, \\ \text{and } \frac{d^2y}{da_1 db_1} &\leq 0. \end{aligned} \quad (4)$$

A larger final endowment value enables a foundation to decrease the bad activity level more, though at a decreasing rate. A higher initial bad activity level increases the post-intervention bad activity level. However, this increase may have a constant scale or be proportional. Figure 1 depicts two alternate intervention technologies fitting these characteristics. The bottom curve depicts an intervention with decreasing returns in a_1 given a lower initial bad activity level b_{1L} . The dashed middle curve shows the corresponding final bad activity level curve given a higher initial bad activity level of b_{1H} , if the in-

⁷For simplicity I have specified the portfolio level of evil to equal the weighted average of individual asset evil levels. However, it could take a different form so that $e_p = g(\boldsymbol{\alpha}, \mathbf{e})$, where $\mathbf{e} \equiv [e_1 \dots e_n]'$. The functional form does not play a role in the basic model presented in this section. However, one can imagine manager and donor preferences (as included in section II) that correspond to portfolio evil measure of, for example, $e_p = \max e_i$.

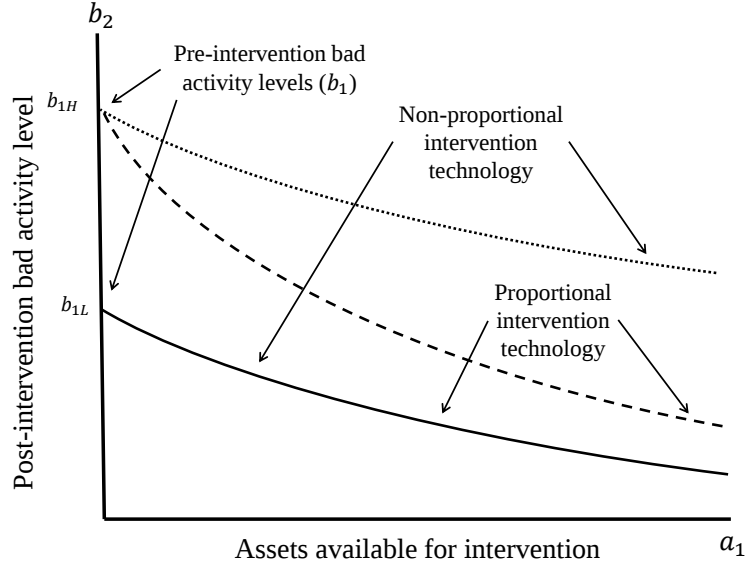


Figure 1: Proportional and Non-Proportional Intervention Technologies

intervention technology is proportional. In this example, the intervention yields a given fractional reduction in b_1 , where this fraction increases at a declining rate with a_1 . This corresponds to $\frac{d^2 y}{db_1^2} < 0$ and $\frac{d^2 y}{da_1 db_1} < 0$. The dotted top curve depicts the final bad activity level given the higher initial bad activity level of b_{1H} and a non-proportional intervention technology. Here the absolute reduction in the bad activity level for a given a_1 is independent of the initial bad activity level. Thus the two non-proportional curves have the same slope at each a_1 with $\frac{d^2 y}{db_1^2} = 0$ and $\frac{d^2 y}{da_1 db_1} = 0$.

In the end, the foundation seeks to maximize expected utility, which in this basic set-up simply decreases in the final bad activity level. (In section A, the possibility that the portfolio's level of evil enters into the utility function

directly is considered.) Specifically,

$$\max_{\alpha} E [U (b_2)] = \max_{\alpha} E \{U [y (a_1, b_1)]\}, \quad (5)$$

where

$$a_1 = a_0(1 + r_p) \quad (6)$$

are the assets available for the intervention and b_1 is the bad activity level realized after the shock that simultaneously affects r_p . Furthermore, $dU/db_2 < 0$ and $d^2U/db_2^2 \geq 0$. Optimality of mission hedging, or doubling down on an investment in a bad firm, follows given the additional assumption that the derivative products are as follows:

$$\begin{aligned} U_A &\equiv \frac{dU}{da_1} = \frac{dU}{dy} \frac{dy}{da_1} > 0, & U_A^2 &\equiv \frac{d^2U}{da_1^2} > 0, \\ U_B &\equiv \frac{dU}{db_1} = \frac{dU}{dy} \frac{dy}{db_1} < 0, & U_B^2 &\equiv \frac{d^2U}{db_1^2} < 0, \\ &\text{and } U_{AB} &\equiv \frac{d^2U}{da_1 db_1} > 0. \end{aligned} \quad (7)$$

These derivative conditions can be satisfied through decreasing marginal utility in the bad activity (which is equivalent to increasing marginal damages) and/or a proportional intervention technology. Pollution reduction and habitat loss prevention are examples of foundation missions that could yield decreasing marginal utility in the bad activity.⁸ A marketing campaign that causes a certain fraction of smokers to quit is an example of a proportional intervention technology. The more money available for the marketing cam-

⁸For intuition consider habitat loss, where the first portion of a species' habitat lost results in very low damages. But the marginal damages due to the loss of the last remaining bit of habitat are extremely high.

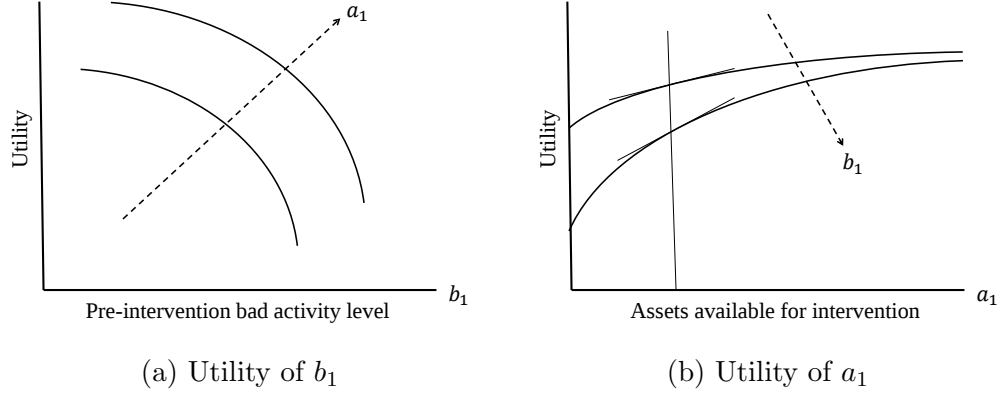


Figure 2: Foundation Utility Function

paign, the greater is the fraction of smokers who are affected. The higher the number of smokers, the more people the campaign can help with the same amount of money. Decreasing marginal utility and proportional intervention technology both make the same dollar more valuable to the foundation on the margin when pre-intervention bad activity levels are higher (see Figure 2.)

A fully expanded version of this optimization problem is

$$\max_{\alpha} E \left\{ U \left[y \left(a_0 \left(1 + \sum_{i=1}^n \alpha_i r_i \right), b_1 \right) \right] \right\}. \quad (8)$$

Now consider a marginal shift between assets j and k , which is essentially a change in weights α_j and α_k :⁹

$$dEU = E \left\{ \frac{dU}{dy} \frac{dy}{da_1} [a_0(d\alpha_j r_j + d\alpha_k r_k)] + \frac{dU}{dy} \frac{dy}{db_1} \left(\frac{db_1}{d\alpha_j} + \frac{db_1}{d\alpha_k} \right) \right\}. \quad (9)$$

⁹This step and that in equation (10) follow the methodology in Shalit and Yitzhaki (1994).

For the time being assume that $\frac{db_1}{d\alpha_j} = \frac{db_1}{d\alpha_k} = 0$, so that the investment itself does not directly affect the pre-intervention bad activity level. (This assumption is relaxed in section A.) Equation (9) can thus be simplified to the following:

$$dEU = dE \left\{ \frac{dU}{dy} \frac{dy}{da_1} [a_0(d\alpha_j r_j + d\alpha_k r_k)] \right\}. \quad (10)$$

Substitute $d\alpha_j = -d\alpha_k$, which must hold in order to preserve equation (1). This yields the following:

$$\frac{dEU}{d\alpha_j} = E \{ U_A [a_0(r_j - r_k)] \}. \quad (11)$$

Recall that $Cov(X, Y) = E[XY] - E[X]E[Y]$. Then:

$$\frac{dEU}{d\alpha_j} = a_0 Cov(U_A, r_j - r_k) + a_0 E[U_A] E[r_j - r_k] \quad (12)$$

The first term on the right-hand side of equation (12) shows that to the extent that asset j 's returns have higher covariance with marginal utility, a shift from asset k to asset j increases expected utility. In other words, under the right circumstances, a foundation can benefit from skewing its investment toward assets that correlate with the foundation's mission-based need. The second term indicates that this increase may be augmented or offset by differences in expected returns, weighted by expected marginal utility of assets.

I now decompose these effects by applying the CAPM, according to which the expected return of a firm can be expressed as follows:

$$E[r_i] = r_f + \beta_i (E[r_m] - r_f). \quad (13)$$

where r_f is the risk-free rate, r_m is the market return, β_i is the beta coefficient such that $\beta_i = \text{Cov}(r_i, r_m)/\sigma_m^2$, and σ_m^2 is the variance of market return.

The realization of firm i 's returns are

$$r_i = r_f + \beta_i (r_m - r_f) + \varepsilon_i. \quad (14)$$

Thus according to the CAPM, an asset's realized return is the sum of the risk-free rate, a risk premium that accounts for the asset's exposure to market-wide risk, and an asset-specific or idiosyncratic risk realization ε_i .

Plugging equation (14) into equation (12) and without loss of generality assuming that $a_0 = 1$, the marginal effect of a shift from asset k to asset j is

$$\begin{aligned} \frac{dEU}{d\alpha_j} = & E[U_A] E[r_j - r_k] + (\beta_j - \beta_k) \text{Cov}(U_A, (r_m - r_f)) \\ & + \text{Cov}(U_A, \varepsilon_j - \varepsilon_k). \end{aligned} \quad (15)$$

The trade-off to expected utility between two assets is therefore a combination of three different effects. The first is expected returns, which may augment or offset the other two covariance effects. The second is covariance between foundation marginal utility and market risk. To the extent market returns are positively correlated with foundation marginal utility of assets, a higher β_i will increase expected utility. For example, a foundation focused on job training programs for the unemployed might prefer a low β_i if its needs are greater when the economy and markets are doing worse. On the other hand, a foundation focused on preserving open spaces from development might prefer a higher β_i if development accelerates in bull markets.

Covariance between foundation marginal utility and idiosyncratic risk is the third component. I call this the *idiosyncratic risk trade-off*. Consider, for example, shifts in smoking rates that affect a lung cancer fighting foundation and a tobacco company's returns but not necessarily the broader economy. This trade-off component lies at the heart of the mission hedging strategy to double down on investments in firms whose returns are correlated with bad activity levels. As depicted in figure 2b, marginal utility of assets a_1 increases with b_1 (as shown by the higher slope on the bottom curve for a given a_1) so that this covariance term will be positive if asset j 's returns are more positively correlated with b_1 than asset k . All other things being equal, shifting to an asset whose idiosyncratic risk has a higher covariance with U_A yields second order stochastic dominance in expected utility. Although investors typically seek to eliminate this idiosyncratic risk through diversification, a foundation can benefit from taking more of it on when this risk is properly aligned with the foundation's mission-determined states of high marginal utility of assets.

In the optimal asset allocation, either these three trade-off components sum to zero or there is a corner solution. If one asset had an extremely high covariance between marginal utility of assets and idiosyncratic risk returns but is in other respects very similar to other assets, then it is conceivable that a foundation could maximize its expected utility by investing completely in that asset. What kind of asset might yield such a covariance? A firm whose business activity is closely intertwined with the foundation's targeted bad activity may yield returns that covary positively with bad activity levels. And often these firms are considered to be evil incarnate. For example, foundations working

on global warming, lung cancer, or animal welfare could, respectively, consider fossil fuel producers, tobacco companies, or meat producers to be objectionable. My result implies that such endowments should skew investment toward these seemingly reprehensible companies unless the expected return from such investments is so low relative to other opportunities that no investment in the objectionable firm is warranted.

It follows that foundations that do not account for covariance between idiosyncratic risk and marginal utility of assets will generally under-invest in high covariance assets. Because objectionable firms are more likely to have such covariance, firewall foundations will underinvest in these firms by disregarding the mission in the investment process. SRI foundations will tend to underinvest in these firms even more by avoiding them altogether.

II. Model Extensions

The basic model presented in the previous section demonstrates how mission hedging can make foundations more successful. However, foundations have not been implementing this strategy. I now explore why they choose to divest from or disregard in the investment process the nature of objectionable firms. In this section I formalize models consistent with the SRI and firewall strategies and then combine all the components presented into a comprehensive mission hedging model. In particular, I incorporate fundraising and pre-intervention bad activity level effects and expand the objective function to allow the level of portfolio evil to enter directly.

A. Socially Responsible Investing Model

An SRI foundation may fundamentally object to investing in reprehensible firms and therefore experience direct negative utility effects from doing so. Thus portfolio evil enters directly into the utility function as follows:

$$\max_{\alpha} E[U(b_2, e_p)]. \quad (16)$$

Furthermore, SRI proponents frequently argue that investing in objectionable firms helps those firms increase bad activity levels, or conversely that the divestment act directly lowers bad activity levels.¹⁰ In other words, contrary to the assumption made in the basic model in section I, $\frac{db_1}{d\alpha_i} \neq 0$. Finally, an SRI foundation may rely on fundraising and worry that resources could be negatively affected by objectionable investments. The SRI foundation solves the following expanded expected utility optimization problem:

$$\max_{\alpha} E \left\{ U \left[y \left(a_0 \left(1 + \sum_{i=1}^n \alpha_i r_i \right) + D \left(\sum_{i=1}^n \alpha_i e_i \right), \right. \right. \right. \\ \left. \left. \left. B \left(b_0, s_b, \sum_{i=1}^n \alpha_i e_i \right), \sum_{i=1}^n \alpha_i e_i \right] \right\}. \quad (17)$$

This problem differs from the basic mission hedging model presented above in equation (8) in the following ways. First, $D(e_p)$, with $dD/de_p \leq 0$ where defined, represents donations received by the foundation as a function of port-

¹⁰For example, student leaders of the Harvard fossil fuel divestiture campaign argued that they “do not expect divestment to have a financial impact on fossil fuel companies.... Divestment is a moral and political strategy.... Divestment calls on citizens to build a powerful climate movement and pressure elected representatives to enact meaningful legislation” (Maxmin and StudentNation (2013)).

folio evil level. Donors contribute less to a foundation with more objectionable investments if the first derivative is strictly negative. These donations are added to endowment assets in the intervention technology function. Second, $B(b_0, s_b, e_p)$, where s_b is the stochastic component affecting the post-shock bad activity level, represents the viewpoint that investments in objectionable firms result in increases to bad activities (and divestments in decreases), with $B_e(e_p) \equiv dB/de_p > 0$. Finally, e_p enters directly into the utility function (as represented by the last term).

In addition, an SRI foundation behaves as if there is no relationship between any firm's returns and marginal utility of assets, or $Cov(U_A, \varepsilon_j - \varepsilon_k) = 0$. Solving this problem by the same steps as in the derivation of equation (15) yields the following trade-off equation:

$$\begin{aligned} \frac{dEU^{SRI}}{d\alpha_j} = & E[U_A] E[r_j - r_k] + (\beta_j - \beta_k) Cov(U_A, (r_m - r_f)) \\ & + (e_j - e_k) \{E[U_A D'(e_p)] + E[U_B B_e(e_p)] + E[U_e]\}, \end{aligned} \quad (18)$$

where $U_B \equiv dU/dy \cdot dy/db_1 < 0$ and $U_e \equiv dU/de < 0$ (where defined). An SRI foundation optimizes with respect to expected returns, systematic risk premia, donation changes, effects on pre-intervention bad activity levels, and the direct disutility of a high portfolio level of evil. However, it does not generally consider the idiosyncratic risk trade-off.

Given all of these trade-offs, one can see how an SRI foundation might optimize by divesting completely of objectionable firms. In particular, if even very low portfolio evil levels trigger significant drops in donations or major

dissatisfaction for foundation managers, then taking on additional evil in the portfolio might not be justified by other increases to expected utility. Evidence for these trade-offs is discussed in section III.

B. Firewall Model

Firewall proponents typically argue that the direct effect of investing on bad activity levels is negligible. Their choices reveal a lack of concern about material impacts of their investment decisions on fundraising and insignificant disutility of evil investments. They tend to support the basic model from section I and the assumptions that $db_1/de_p = 0$ and $dD/de_p \approx 0$. However, in arguing that investments should be made in a values-vacuum, firewall advocates like SRI practitioners act as if $Cov(U_A, \varepsilon_j - \varepsilon_k) = 0$. In other words, firewall advocates optimize as if the trade-off faced by the foundation equals the following:

$$\frac{dEU^F}{d\alpha_j} = (\beta_j - \beta_k) Cov(U_A, (r_m - r_f)) + E[U_A] E[r_j - r_k]. \quad (19)$$

By ignoring the idiosyncratic risk trade-off, firewall foundations may make suboptimal portfolio allocations and miss opportunities to increase expected utility. In particular, they will underinvest in objectionable firms whose idiosyncratic risk returns covary strongly with marginal utility of assets.

C. Comprehensive Mission Hedging Model

Adding the components included in the SRI model in equation (17) to the basic mission hedging model while allowing for a non-zero idiosyncratic risk covariance term yields a comprehensive equation with trade-offs as follows:

$$\begin{aligned}
\frac{dEU}{d\alpha_j} = & E[U_A] E[r_j - r_k] && [\text{Expected Return}] \\
& + (\beta_j - \beta_k) Cov(U_A, (r_m - r_f)) && [\text{Market Risk}] \\
& + Cov(U_A, \varepsilon_j - \varepsilon_k) && [\text{Idiosyncratic Risk}] \\
& + (e_j - e_k) E[U_A D'(e_p)] && [\text{Fundraising}] \\
& + (e_j - e_k) E[U_B B_e(e_p)] && [\text{Direct Investment Effects}] \\
& + (e_j - e_k) E[U_e] && [\text{Direct Disutility}]
\end{aligned} \tag{20}$$

This is a generalized model, where equation (15) is a special case that assumes that $D'(e_p) = B_e(e_p) = U_e = 0$.

III. Evidence for Trade-Offs

I now explore the magnitude of the equation (20) trade-offs that endowment managers must weigh against the idiosyncratic risk trade-off in deciding whether to engage in mission hedging. My findings are as follows. Theoretical models show that investments can directly affect pre-intervention bad activity levels. But empirical evidence indicates these effects only come into play with very substantial investment levels, typically far beyond what mission hedging prescribes. The fundraising trade-off may be significant for some foundations but is immaterial to the majority that do not accept any donations. The

expected return trade-off will often augment the idiosyncratic risk trade-off core to mission hedging, as many objectionable firms are found to have higher returns. However, this may be offset by the market risk trade-off. Finally, to address the direct disutility trade-off, I explore basic ethical arguments and find support for the ethical application of mission hedging. Evidence thus indicates that there will be foundations for whom the benefits of mission hedging are not completely offset by other trade-offs, though this should be evaluated on a case-by-case basis.

A. Investment Effect on Pre-Intervention Bad Activity Level

The basic mission hedging model presented in section I assumes investments do not directly affect pre-intervention bad activity levels. Because divestment proponents often disagree with this assumption, section II introduced the trade-off term dB/de_p to allow for investments to affect bad activity levels pre-intervention. Large positive dB/de_p may make divestment optimal.

There are two key ways in which investments could directly increase pre-intervention bad activity levels. First, an investment could be seen as an endorsement of a firm, thereby increasing the firm's goodwill. If this is a real concern, a foundation can explain that its investment is strategic and not a show of support for the firm.

Second, if the stock demand curve slopes downward, then mission hedging can raise the stock price by increasing the investor base. This could in turn cause the firm to increase bad activity through management incentives or lower cost of capital. In the context of imperfect information, Merton (1987) shows

that an exogenous increase in a firm’s investor base results in an increase in optimal investment level due to a lower cost of capital.¹¹ Rivoli (2003) cites diverging investor opinions and imperfect substitutes as additional theoretical market imperfections that could result in downward-sloping demand curves.

Heinkel et al. (2001) show through an equilibrium-based model that green investors shrinking a polluting firm’s investor base may cause the firm to clean up. Here the mechanism is risk-sharing. It follows that if green investors choose instead to invest in polluting firms, this could increase pollution by those firms. However, in calibrating their model, Heinkel et al. (2001) find that green investors need to initially account for at least 20 percent of all investments in the polluting firm in order to cause it to invest in cleaner technology. If total market value is \$30 trillion (the sum of the individual market capitalizations of all stocks in the Center for Research in Security Prices (CRSP) dataset), then this would correspond to \$6 trillion of assets committed to a divestment movement. Therefore theoretical evidence suggests that investments could affect pre-intervention bad activity levels, but it remains unclear whether this effect is empirically meaningful.

To address this point, one must first determine whether the investment (or divestment) is likely to have a significant effect on share prices. Two main empirical approaches to answering this question are to examine specific socially-motivated divestment events and to estimate general elasticity of demand for stocks.

¹¹In the Merton (1987) model, each investor has information on only a subset of firms and is only willing to invest in firms on which it has information. Thus each firm has a different subset of investors for its base.

The mass boycott of firms doing business in South Africa during Apartheid is the most studied divestment event. However, even with this major event, there is no clear consensus on the divestment campaign's effectiveness. One key challenges in this line of research is isolating the effect of the divestment campaigns from related consumer boycotts and other pressures and news. Furthermore, investors may be more willing to divest from socially objectionable firms if those firms face fundamental risks that make them otherwise unattractive investments, which could lead to potential omitted variable bias in analyses.¹²

With the above caveats in mind, highlights of results on the South African divestment movement are as follows. Kumar et al. (2002) survey research related to the divestment as a means to help end Apartheid in South Africa and report mixed results. In their own analysis, they find that firms remaining in South Africa during the boycott experienced increased institutional ownership and positive abnormal returns when Nelson Mandela called for an end to the boycott. However, Teoh et al. (1999) show that only the first in a series of voluntary pension fund announcements of divestment from South Africa (during Apartheid) had a significantly negative effect on relevant share prices. Thus even within one campaign, the benefits of specific divestment activities may

¹²For example, a Lexis/Nexis news search on the recent fossil fuel divestment campaign reveals that the ramp-up in divestment announcements has coincided with unfavorable market conditions for the coal industry as dropping natural gas prices and tighter regulations have made coal prospects very uncertain (Macdonald-Smith (2014)). It is unclear how many organizations divesting from coal might not do so in the absence of the unfavorable outlook for the coal industry. A counterexample is the divestment campaign targeting Monsanto (see Food Democracy Now! at http://action.fooddemocracynow.org/sign/take_the_Monsanto_stock_plunge/), which has failed to gain traction while Monsanto performed well on the stock market.

vary significantly. In an event study of firms announcing exits from South Africa, Posnikoff (1997) finds a positive announcement effect. Meznar et al. (1994, 1998) find that firms withdrawing from South Africa experienced negative abnormal returns. However, McWilliams and Siegel (1997) have raised concerns with Meznar, Nigh and Kwok’s methodology and in a replication study show that the abnormal returns in the South African Apartheid case are small and insignificant.

Research on other divestment events is limited. However, Ding et al. (2014) examine the boycott of firms doing business in South Sudan and find that quarters with increased divestment campaign news stories coincided with decreases in stock prices and institutional stock ownership and were followed by quarters with higher returns. However, inferences are limited by the fact that stock divestment news may coincide with news about consumer boycotts and other items relating to firm fundamentals.

On the question of elasticity of demand, Loderer et al. (1991) estimate price elasticity of demand for stock by examining primary stock offerings of already publicly traded firms. They find announcements of offerings increasing the number of shares yield negative price effects. However, they are unable to clearly attribute these changes to mechanisms like liquidity and heterogeneous beliefs that underpin theoretical explanations (like Merton (1987)) for downward sloping demand.¹³

Another approach examines the impact of inclusion in an index, which increases firm investor bases. Petajisto (2009) finds that S&P500 inclusion can

¹³Note that one issue with the Loderer et al. (1991) results may be their use of relative price changes rather than abnormal returns.

result in price impacts of up to 3 percent. Similarly, Capelle-Blancard and Monjon (2012) find evidence for significant positive abnormal returns coinciding with SRI index inclusion. However, these abnormal returns may result from information conveyed by SRI index inclusion rather than the resulting investor base increase. In summary, there is some empirical support for downward sloping demand. However, it is not clear how steep that slope is or how much of a price effect a particular investment might have.

In order for an investment (or divestment) to directly cause an increase (or decrease) in bad activity levels, any resulting stock price increase must be followed by a corresponding change in firm behavior. While it is well understood that stock returns predict firm investment levels, it is not clear to what extent this relationship is causal. Morck et al. (1990) show that incremental explanatory power of stock returns is small when fundamentals are accounted for, finding only limited support for the idea that stock price changes drive firm investments. Similarly, Blanchard et al. (1993) find that share price changes have a limited impact on investment unless they are matched by corresponding changes to fundamentals. However, there may be some heterogeneity of firm investment sensitivity to share prices. For example, Chen et al. (2007) and Baker et al. (2003) find that investment-to-price sensitivity is strongly positively correlated with the amount of private information in price and the level of firm equity dependence, respectively. These types of results may provide some guidance as to whether particular firms are likely to respond meaningfully to given stock price changes.

The magnitude of dB/de_p will increase with endowment size. Larger foun-

dations are both more likely to negatively affect bad activities with their investments in objectionable firms and to be able to have a positive effect through screening. However, with a median asset size of about \$20 million (and a mean of about \$70 million), most of the 59 foundation signatories to the Divest-Invest Philanthropy fossil fuel divestment campaign (for whom asset data were available)¹⁴ are unlikely to have much individual impact on multi-billion dollar firms.

In summary, there is limited evidence that investments made on the secondary market may increase pre-intervention bad activity levels. In order to change firm behaviors, divestment movements must generally occur on a massive scale beyond that prescribed by mission hedging. However, foundations considering doubling down on objectionable investments may mitigate concerns by ensuring that their investments (in aggregate with other foundations in the same field) are small relative to the market capitalizations and trading volumes of the narrowly targeted firms. Or endowments can, where possible, opt for alternative investments that through their correlations provide some hedge on the mission but are not in a position to influence bad activity levels. For example, an anti-tobacco foundation could invest in a tobacco-related medical device company. Or a foundation could potentially invest in a factor-mimicking portfolio of stocks highly correlated with the bad firm’s idiosyncratic return component. Choices like these will likely reduce the expected utility benefit from mission hedging.

¹⁴**Divest-Invest Philanthropy.** “Signatories.” <http://divestinvest.org/philanthropy/signatories/#/signatories> (accessed June 10, 2015). **ProPublica.** “Nonprofit Explorer.” <https://projects.propublica.org/nonprofits/> (accessed June 10, 2015).

B. Foundation Fundraising

I now consider whether portfolio evil level e_p might reduce assets by decreasing donations due to public outrage. I find that the majority of private foundations do not accept donations and therefore are not affected by the fundraising trade-off. Table 1 shows results of an examination of IRS 990-PF foundation tax returns. 64 percent of all foundations (holding more than half of foundation assets) accepted zero donations in 2011. Furthermore, only 30.7 percent of foundations (holding about one-third of assets) received contributions, gifts, grants, etc., in excess of 5 percent of their total expenses and disbursements that year. I designate these as “Significant Donations” foundations, providing a proxy for foundations potentially at operational risk through mission hedging. However, this proxy likely overestimates how many foundations risk losing important donations. Many of these foundations likely rely on donors (including founders, other foundations, governments, and other institutions) whose funding decisions will not be affected by endowment investments.¹⁵

The fact that most foundations are not currently divested from objectionable stocks¹⁶ represents additional evidence that fundraising is not a broad concern for foundations when it comes to their investments. Firewall foundations have maintained their investment approach even after encountering fierce public criticism. For example, in 2007 the Los Angeles Times printed a

¹⁵This analysis does not include universities and colleges, which may legitimately be concerned about the impact of investments on attracting alumni donations. But divestment from particular firms or sectors may work to increase or decrease aggregate donations.

¹⁶In a 2012 survey, the US SIF Forum for Sustainable Investing found only 95 U.S. foundations that applied environmental, social, or corporate governance criteria in their investments (US SIF The Forum for Sustainable and Responsible Investment (2014)).

Table 1: Foundation Fundraising

All Foundations			Zero Donations		Significant Donations	
Asset Range (\$mil)	Number	Assets (\$mil)	Percent of Total	Assets (\$mil)	Percent of Total	Assets (\$mil)
0.0-0.1	15,785	540	48.6	315	48.2	208
0.1-1.0	34,704	14,819	68.0	10,192	26.6	3,789
1.0-10.0	24,708	77,559	69.0	52,394	25.3	20,565
10.0-34,000	6,471	525,751	60.2	269,540	30.1	184,108
0-34,000	81,669	618,670	64.0	332,441	30.7	208,671

“Zero Donations” foundations are those who reported zero Contributions, Gifts, Grants, Etc. Received on their 2011 990-PF tax returns. “Significant Donations” foundations have received Contributions, Gifts, Grants, Etc., representing at least 5 percent of their total expenses and disbursements (including grants) in 2011. Foundations that started or ended the year with no assets or made no grant payments over the year were excluded, as were those that were terminated or in a 60-month termination. These summary numbers have been adjusted to reflect the stratification weights applicable to each observation.

[Source] These 2011 data are based on 990-PF micro-file data from the IRS accessed at <http://www.irs.gov/uac/SOI-Tax-Stats-Private-Foundations-Harmonized-Microdata-Files-ASCII> on 2/20/2015.

dramatic 12-article investigative series criticizing the Bill and Melinda Gates Foundation for investing in firms working counter to its mission (Piller et al. (2007)). After the series ran, the Gates Foundation did not divest from the firms in question (Piller (2007)). Like most private foundations, the Gates Foundation does not rely on fundraising for continued operations. Furthermore, it is hard to imagine grantees rejecting funding from the foundation over this issue.

A foundation concerned about public backlash against investments can explain that its mission hedging strategy will improve the expected mission

outcomes that it and its supports care about. If this explanation fails, the foundation may invest in alternative assets whose returns correlate with the bad activity level, as discussed in section A, or use derivatives like stock options to benefit from the exposure to a firm’s idiosyncratic risk without actually owning shares. These investments could be described as a form of insurance and thus be more palatable for donors. In summary, while it may pose public relations challenges, the majority of foundations will not put necessary donations at risk through mission hedging.

C. Expected Returns and Market Risk

I now explore whether the expected return and market risk trade-offs will offset or augment the idiosyncratic risk covariance trade-off for objectionable firms. In comparing a firm’s expected returns to an alternative investment, the previously discussed possibility of a downward-sloping demand curve for stocks may augment the benefits of mission hedging. To the extent that the questionable firm is objectionable to some SRI investors, and therefore, has a smaller investor base, lower share price, and higher return, a mission hedging strategy will increase the foundation’s ability to directly lower bad activity levels through both the hedging aspect and higher expected returns. However, this may be offset by higher systemic risk.

Hong and Kacperczyk (2009) find evidence for this in their study of “sin stocks,” where they show that tobacco, alcohol, and gambling stocks are held less by norm-constrained institutions (like pension funds) and that they have higher expected returns than comparable stocks. Other studies like Fabozzi

et al. (2008) also find significant excess annual returns for sin stocks. This could be due to downward-sloping demand curves or unusually high risk profiles. Renneboog et al. (2008) provide a good overview of some of the key empirical performance studies and find that “the existing studies hint but do not unequivocally demonstrate that SRI investors are willing to accept sub-optimal financial performance to pursue social or ethical objectives.” Capelle-Blancard and Monjon (2012), on the other hand, examine the trends in SRI literature and assert that there is consensus that SRI funds perform similarly to “conventional” peers and benchmark indexes. However, they do not provide clear empirical evidence for their conclusions.

In summary, available evidence indicates that the expected return trade-off component is likely to be negligible or to augment mission hedging benefits. However, foundations need to consider this on a case-by-case basis. If expected returns are low enough on an objectionable firm, this could outweigh other beneficial trade-offs enough to make divestment optimal. For example, if the recent challenges faced by the coal industry (as discussed briefly in section A) are expected to continue, then expectations of inferior stock returns might make divestment optimal regardless of idiosyncratic risk trade-off benefits. On the flip side, to the extent that a foundation expects to earn superior returns on an objectionable firm, it should consider the additional market risk exposure the stock carries and whether this means that the demand curve is downward-sloping enough for the foundation’s investment to meaningfully increase the firm’s bad activities on the margin.

D. Direct Disutility of Evil Investments

To help evaluate the direct disutility trade-off component, I consider the question of how mission hedging might be viewed from an ethical perspective. Irvine (1987) provides an excellent overview of the basic ethical principles relevant to SRI. He argues that the “Evil-Company Principle” (that it is wrong to invest in an evil company) and the “Tainted-Profits Principle” (that it is wrong to benefit from the wrongdoing of others) are so inherently flawed that they are not reasonable grounds for screening. In recognition of the fact that some foundations (or their managers) may nonetheless be motivated by these principles, I allow for them through the inclusion of the last trade-off element in equation (20).¹⁷

Irvine (1987) then presents the “Enablement Principle” (that it is wrong to enable others to do wrong) as a valid reason to conclude that SRI is morally superior. Irvine further considers revisions like “act-utilitarianism” under which the Enablement Principle says: “It is wrong for me to do something that enables others to do wrong, unless my failure to do the thing in question will have even worse consequences.” He argues that the “Small-Purchase Objection,” that an individual investor’s small investment is acceptable because it won’t have a significant impact, fails under the “Universalizability Principle,” which states that an act is problematic if it causes problems when repeated by everyone.

To the extent that one agrees with Irvine (1987), the morality of mission

¹⁷Note that even if there are no ethical concerns with an investment, there may be psychological or other sources of direct disutility associated with it.

hedging relies on the act-utilitarianism revision of the Enablement Principle. Although the foundation invests in what it sees as morally problematic firms, by doing so the foundation is uniquely positioned to (on average) do more good than harm by this action. However, there is still a concern about universalizability. What if all foundations engage in mission hedging?

Mission hedging is not a simple endorsement for all investors to concentrate their investments in firms they see as evil. Rather, mission hedging applies in a focused manner. A given foundation's mission may not lend itself to mission hedging for lack of firms whose returns correlate well enough with the foundation's targeted activities. Thus, for example, while the theory I have presented here indicates an anti-lung cancer foundation might benefit at least in part from skewing its investments toward tobacco firms, the mission hedging strategy would not in any way apply to its potential investments in fossil fuel firms. Even in cases where there are firms whose activities clearly conflict with foundation missions and whose returns correlate with bad activity levels, the aggregate assets held by all foundations targeting that particular set of firms under mission hedging are unlikely to be large enough to cause problems. To the extent this is a concern, foundations with common goals can work collaboratively to determine if their aggregated investments could potentially cause problems. Not being subject to anti-trust regulations, foundations may and often do cooperate.

IV. Market Pricing of Foundation Mission Hedging

In the model presented above, the market does not react to the endowment's asset allocation and its (potential) effects on firms. A number of factors determine the validity of this assumption that a foundation's greater expected reduction of bad activity through mission hedging won't affect the share prices of a firm whose profitability is somehow intertwined with that bad activity. For example, a foundation seeking to fund carbon sequestration research might focus its mission hedging investments in the energy sector. Because greenhouse gases are a byproduct of the firms' activities and successful carbon sequestration does not reduce revenues or increase costs for the firms, the market should not shift the stock price in response to the foundation's decision to engage in mission hedging.¹⁸

On the other hand, a foundation with a proportional intervention seeking to fund a smoking cessation campaign that affects a fraction of smokers will on average hurt the bottom line of tobacco companies more if it implements mission hedging than otherwise. In this case the tobacco firm's share price should decrease *ex ante* (before the shock) under mission hedging.¹⁹ In addition, a pre-intervention positive shock to (or increase in) smoking should result in a

¹⁸In fact, one could argue that the greenhouse gas emitting firms could benefit from successful carbon sequestration projects as consumers concerned about their carbon footprints might increase their consumption upon knowing that their emissions can be sequestered.

¹⁹The possibility has been raised that the foundation could benefit from shorting a firm that it will affect negatively through its intervention, causing the price to fall. This relies on an assumption that the market does not know about or believe in the effectiveness of the foundation's intervention. Here I am operating instead under the assumption that the market already knows about the foundation's activities and believes the foundation is simply investing in the alternative investment.

smaller increase in share price because the market knows the foundation, having skewed its investment toward tobacco, and thus having also had abnormal positive returns to its endowment, now has more funds with which to convince smokers to quit. Similarly, the negative price shock accompanying a negative smoking shock should be smaller because the mission hedging foundation now has fewer funds available for its campaign than it would have otherwise. In this sort of situation, the foundation might be wise to announce its strategy before making its purchases so that it can benefit from the lower ex ante price.

Finally, if a foundation whose intervention technology is not proportional and will affect the bottom line of the firm²⁰ engages in mission hedging, the firm's share price should not be affected ex ante because the expected post-intervention bad activity level is not affected. However, the market reaction will dampen return shocks under mission hedging versus divestment because the post-intervention bad activity levels will be less positive and negative. This dampening of return shocks will result in a smaller idiosyncratic risk trade-off term and less benefit to mission hedging.

V. Conclusion

Both sides of the debate on whether foundations should disregard the objectionable nature of firms or divest from them have missed an important issue. Investing heavily in objectionable firms may increase foundations' expected utilities by aligning availability of additional funds with need for those funds.

²⁰This is probably the least likely scenario. One example might be a foundation seeking to help individuals reduce their fast food consumption by giving them fresh unprocessed food to consume instead. The objectionable firms in this case might be fast food companies.

In this paper I have formalized the endowment investment problems whose solutions are consistent with the divestment, firewall, and mission hedging approaches, articulated the trade-offs faced by foundations deciding how much to invest in objectionable firms, identified a key idiosyncratic risk trade-off that has been absent from the debate, and examined the theoretical and empirical evidence for these trade-offs. I have shown that foundations can increase expected utility by skewing investment toward firms whose returns correlate with the activities the foundations seek to reduce or eliminate.

Although I have not included a formal analysis of a foundation with more than one mission, the intuition for this extension is as follows. The first order condition for the *ex-post* allocation of funds between missions requires that the marginal utility of the money spent on program areas be equal. Making substitutions following on that fact yields the same basic analysis as the single-mission case, except that the idiosyncratic risk trade-off magnitude is probably smaller because of the split focus.

Further empirical analyses related to trade-offs and case studies of firm return covariance with targeted bad activity levels could prove valuable. More practical guidance on how foundations should determine how much to invest in specific objectionable firms could help foundations implement mission hedging. Analyses of how firm fundamentals and returns affect divestment campaign participation would shed light on the role of the expected return trade-off in the divestment decision and a possible source of bias in divestment event studies like those on South Africa during Apartheid.

Divestment is making headlines with college students pressuring adminis-

trators to divest their endowments primarily of fossil fuels, but also of guns and Israeli stocks. Major universities have announced their decisions to divest (or not) from fossil fuels. Private foundations have also joined the movement, including the high profile Rockefeller Brothers Fund (Schwartz (2014)) as well as many smaller funds, both with and without environmentally-oriented missions.²¹ Just as in voting, where one individual's decision not to vote is unlikely to determine the outcome in a major election, one foundation's divestment is unlikely to change a company's behavior. The power in moves like that of the Rockefeller Brothers Fund lies more in the ability to encourage others to follow suit than in directly changing fossil fuel firm behaviors through selling shares of stock. The potential success of propelling a broad divestment movement must be weighed against all trade-offs, including the mission hedging benefit of making more funds available when they are needed the most.

While major divestment movements have the potential to bring about change, my results show that firms who are seen as bad actors may provide good opportunities for hedging foundation-specific risks. Endowment decision-makers need to ask whether divesting, disregarding values in investing, or doubling down on objectionable stocks will yield the best social outcomes given not only their values but their unique missions, talents, and possible correlations between firm financial returns and foundation spending needs.

²¹See **Divest-Invest Philanthropy**. "Signatories." <http://divestinvest.org/philanthropy/signatories/#/signatories> (accessed June 10, 2015.)

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