

Freedom to Choose

ESG Goals & The Problem of Convenient Values

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Abstract

Economic, social, and political pressures as well as private motivations have led to a growing number of firms pursuing environmental, social, and good governance goals and not “just” maximizing financial performance. The large number of possible social dimensions – the UN Sustainable Development Goals include two hundred and forty seven indices – creates a problem of organizational attention. Given constraints on organizational capacity, firms must choose a subset of normative dimensions. Here, we consider the possibility that firms choose values that have minimal effect on profits. In a skeletal model, we show that contrary to intuition, firms that adopt *convenient values* place more weight on dimensions with high mitigation costs. By choosing convenient values,, firms can have it both ways. They can consistently pursue an ESG agenda but with limited impact on their bottom line. In an expanded model that includes externalities between goals, we show that firms with convenient values place less weight on dimensions that are subject to positive spillovers from actions on other dimensions. Finally, we show that net zero constraints can create a substitution effect that reduces actions on other dimensions.

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Growing awareness of external and systems effects of economic actions on the environment and society have created social and political pressure on firms to include environmental, social, and good governance objectives. Publicly traded firms have even greater incentive. Funds signed pledges to include social and environmental criteria manage over \$100 trillion in assets. The criteria applied by the investment community differ in scope, measurement, and weight (Berg et al 2023) as do those used by governments and NGOs. That variability in what constitutes good behavior allows firms flexibility.

In this paper, we consider the implications of firms having the freedom to choose these non economic values. Growing environmental and equity concerns embodied in the United Nations Sustainable Development Goals have led to pressure on firms to consider the impact of their actions more broadly. In response, many for profit organizations now pursue environmental, social, and good governance objectives. Within these broad categories, there exists hundreds of individual objectives. Environmental objectives can include clean air, clean water, ecosystem management, carbon reduction, or even saving a particular species. Thus, firm's have a choice.

We assume that confronted with that choice, firms may choose *convenient values*, a collection of weights across social dimensions that produce maximal profits given a threshold aggregate level of social concern. Unlike when firms adopt greenwashing or selective reporting, here the firms act do not engage in nefarious actions. To the contrary, they act consistent to their values which balance a concern for profits and normative dimensions. The consistency has many advantages. It simplifies decision making within the firm, and it makes the firm attractive to consumers and employees.

In classical economic theory, firms seek to maximize profits given technological constraints and regulations. Profit maximizing firms ignore unpriced externalities on people, other firms, and the environment. Some of economists call externalities accumulate across firms and over time to produce systems effects that impact our well being and the sustainability of life. The

levels of carbon in the atmosphere, concentrations chemicals in groundwater, and amounts plastic particulates in our oceans being the most salient examples.

Firm level decisions also influence societal well being. Working conditions contribute to worker physical and mental health. Firm level decisions on how to define jobs influence distributions of income. And, cultures and norms within firms can spread into society. Firms can encourage selfishness or a concern for others.

The fact that firms do more than produce profits has created political and social pressure on organizations to introduce environmental, social, and good governance (ESG) policies. Efforts on these other dimensions can improve a company's brand, reduces the likelihood regulatory action, and can help to maintain and lure top talent. Maximizing financial may involve doing social good. Broad brush evidence supports that conclusion. The evidence supports a positive correlation between firm level ESG efforts and financial performance (Friede, Busch and Bassen 2015).

The increase in purpose driven organizations provides even more reason for optimism. As of 2022, more than five thousand organizations were certified as B Corps which eschew profit maximization as their primary goal. To certify as a B Corp, an organizations must meet certain standards and achieve an aggregate score across a variety of dimensions that exceeds a threshold. The scoring rule includes impacts on workers, communities, the environment, suppliers, and customers.¹

We might then ask whether, in aggregate, these efforts are working. To answer that question, we can look at the The United Nations seventeen Sustainable Development Goals (SDGs). These include clean air and water, child labor, gender equality, and infrastructure. These seventeen goals are further decomposed into two hundred and thirty unique measurable targets. With some notable exceptions, like carbon output, on most targets, progress has been steady but slow. One can question on whether the creation of the SDGs as focal goals

¹See <https://www.bcorporation.net/en-us>

and then counting on a combination of economic, social and political pressures will prove sufficient. Firms may include ESG goals in their objectives, but doing so will not erase the deleterious effects of their profit seeking activities. Many have come to believe that the tension between economic growth and equity and environmental goals cannot be overcome within the current approach (Nature 2020).

The efficacy of socially encouraged global goal setting to solve collective problems has been called into question (Biermann, Kanie, and Kim, R. 2017). Setting global goals satisfies none of Ostrom eight principles for governing a common pool resource (Ostrom 1990). The ability to monitor, one of the principles, does require measures like the two hundred plus created within the SDGs. Measures though do not guarantee accountability. Most important, success will require coordination of activities within and across countries at levels and extents far beyond current practices. Goal creation alone offers no route for coordinating on coherent global policies (Nilsson and Weitz 2019, Brand Furness, and Keijzer 2021, Montiel et al 2021), leverage points (Chan et al 2020) or transformational pathways (Sachse et al 2019). Achieving the goals is not only a coordination problem. Some internalization of social costs will also be necessary (Johnston et al 2021).

Here, we focus on the organizational level. The SDGs place almost comically unreasonable demands on firms. Maximizing profits is difficult enough. Remaining competitive while taking into account two hundred other dimensions is impossible.² We cannot, therefore, expect organizations to balance all of these concerns when making decisions. Instead, organizations will direct their efforts to a limited set of targets or goals. To borrow a term introduced by Harstad and Selten (2016), firms will engage in diminished dimension actions. They will do so because of bounded organizational capacity.

Rational inattention models show that organizations should ignore low value low variation dimensions (Sims 2003). Ignore what is unimportant and relatively stable. Keep one's eyes on

²We ignore here the capacity of governments to make the necessary institutional changes, which may not be likely (Andrews 2012).

the important dimensions. That approach of course begs the question of what is important? What ESG and SDG dimensions should firms value? That is the question we take up here. We construct a model to analyze the implications of allowing firms to choose how they weigh various environmental, social and good governance concerns. In our model, organizations maximize a combination of profits and a weighting of a collection of *normative dimensions*. We do not consider carbon taxes or electric vehicle subsidies (Baumol 1972, Chichilnisky and Heal 1995). Yet, one could interpret the weights embedded in a firm's values as including taxes and subsidies.³

Where organizations expend their efforts depends on the weights that they assign to different dimensions. The more weight a firm places on a dimension, say clean air, the more relative effort they take on that dimension. Global progress across all of the dimensions depends on the cumulative actions of every actor from yoga studios in Wichita, Kansas to the Exxon corporation. Though we focus on firms here, the same logic applies to governments. They also have incentives to choose convenient values (Reinar and Lundberg 2023).

Our formal analysis consists of two parts. We first consider a single organization and describe how it might choose values, which we represent as a collection of weights on the normative dimensions. We then consider an economy consisting of many organizations and analyze the effects of technological changes and net zero policies.

Our single firm analysis consists of multiple parts. We first assume that an organization cannot take purposive actions. We assume that an organization's profit making activities have measurable effects on the normative dimensions, but the firm lacks any capacity to take direct actions on those dimensions. We define *convenient values* to be a collection of weights across the social dimensions that firms choose that allow them to maximize profits

³We take for granted that firms report progress on SDGs in their financial reporting. Consistent with legitimacy theory, larger and public firms are more likely to do as are firms that have more positive impacts (Elalfy, Weber, and Geobey, 2021). Reasons for disclosure can be economic or socio-political (Hahn, Reimsbach, and Schiemann 2015), reporting can be selective (Lashitew 2021), and multiple standards for reporting (Pizzi and de Nuccio 2022).

while meeting a threshold level of social concern.

If firms cannot take purposive actions, values act as a constraint on the set of allowable actions. An organization that lives up to its values will be precluded from taking otherwise profitable actions. One straightforward result is that organizations will avoid placing weight on dimensions on which they produce large negative impacts. This avoidance would be mitigated in the case of reflexive pollution where mitigation directly benefits the organization (Kohn 1991). We show that firms will choose values that are *non disruptive*. They can have minimal or no effect on profits because they do not create any constraint on profit seeking activities. Non disruptive weights will be spread across dimensions on which the organization expects to either produce positive impacts or relatively small negative impacts. An organic grocery store chain that values reducing child labor would be non disruptive. An electric vehicle company that value clean oceans would not have non disruptive values, as precious minerals used in car batteries are mined from ocean floors.

Next, we allow organizations to take purposive actions on normative dimensions. Those actions come at a cost. Taking values as fixed, we show that firms place more effort on dimensions that have high value and which have low marginal cost. We then show, counter to intuition, that if firms can choose their values prior to taking purposive actions, then to minimize the cost of purposive actions, the firm should place weight on dimensions proportional to their marginal costs. Firms that choose these *cost minimizing values* impede progress.

The assumption that purposive actions can be directed to single normative dimensions does not hold in reality. Purposive actions tend to cause spillovers on other normative dimensions (Nilsson et al 2016, Iacobuta et al 2021). These spillovers can either be in the form of additive externalities or systems effects. (Barbier and Burgess 2017, Roggero 2017). Each type can be positive or negative. Actions can involve tradeoffs or synergies across the SDGs. These can differ by region (Pingali, Plavsic, 2022). We extend our model to include externalities and derive a closed form solution for *cost-spillover contingent values*. These values

minimize the total costs of purposive actions taking into account direct costs and spillovers.

We then construct a dynamic, multi-firm model and show that convenient values produce progress across all of the goals regardless of the variations in costs of different dimensions across firms. Convenient values imply even, but slow progress. In contrast, cost based weighting or equal weighting leads to faster overall progress but less even progress. We also show that if firms adopt convenient values, technological advancements on a single dimension or a subset of dimensions produce compensating behavior resulting in a uniform increase in effort on all social dimensions, the same effect as if the firm had an increased concern for social dimensions overall. We also if firms adopt convenient values, the imposition of net zero constraints will reduce progress on other normative dimensions uniformly. Sixth, adding a normative dimension increases total purposive effort if firms adopt convenient values if and only if the new dimension has lower than average costs of mitigation. Finally, we explore the implications of social and political pressures that cause firms to place weight on dimensions on which less progress has been made. We show that if cost diversity is low, social pressure can be good, but if cost diversity is high, social pressure may be less effective in the long run if technology changes costs. , Net Zero Constraints reduce the set of actions taken, improve performance on the dimension to which they are applied, but can lower overall performance on social goals.

Convenient Values

We assume a single firm that balance profits and a concern for a set of N *normative dimensions*. In each period, a firm chooses an action form a set of possible actions. Those actions produce profits and impacts on the normative action.

Our model makes a number of simplifying, and undoubtedly empirically incorrect assumptions. Specifically, we assume firms have linear value functions with weights on each

dimension and quadratic costs. The functional forms make the logic more transparent. Our results would all hold qualitatively with more general functional forms. We make these assumptions to identify the effects of *convenient values* and compensating behaviors to mitigate technological gains.

These normative dimensions could be the SDG target measures or any other other set of measurable values. Global progress on these goals at time t is denoted as follows:

$G_t = (g_{1t}, g_{t2}, \dots, g_{Nt})$ denotes **global progress** on the N normative dimensions.

Firms care about profits and about their contributions on the normative dimensions.

Our analysis considers a firm that takes a In each period, t , firm f contemplates an *action* a_{ft} , that produces a profit $\pi(a_{ft}) > 0$ and a vector of *normative dimensions* $\phi_{ft}(a_{ft}) = (\phi_{ft_1}, \phi_{ft_2}, \dots, \phi_{ft_N})$. Each ϕ_{ft_j} is a random draw from a distribution with a mean μ_{fj} . We refer to this as the firm's *natural drift*. Without purposive actions, the model produces a random walk with drift on each dimension. On each dimension, the drift equals the expected sum of the random effects of all firms. With M firms, we can write the expected value of G_{t+1} as follows:

$$E[G_{t+1}] = \left(g_{1t} + \sum_{f=1}^M \mu_{f1}, g_{t2} + \sum_{f=1}^M \mu_{f2}, \dots, g_{Nt} + \sum_{f=1}^M \mu_{fN} \right)$$

Unless otherwise noted, we assume $\mu_{fj} < 0$, an assumption that, on average, profitable activities create negative effects on the normative dimensions. Given that assumption, if firm's did not care about the normative dimensions, performance on the all of the social dimensions would decline. We make this assumption for analytic convenience. The actions of for profit organizations may improve progress on some dimensions, such as reductions in poverty. Nothing in our analysis is changed if we allow for positive effects.

We assume that firms espouse a set of values, a vectors of weights on the normative dimensions. $\omega_f = (\omega_{f1}, \omega_{f2}, \dots, \omega_{fN})$ representing **corporate values** on the N normative

dimensions.

The firm's *objective function* can be written as follows:

$$V(a_{ft}) = \pi(a_{ft}) + \sum_{j=1}^N \omega_j \phi_{ft_j}$$

Nondisruptive Values

To build intuition, we first consider contexts in which organizations cannot mitigate the effects of their actions on the normative dimensions. If an organization's actions were always positive on some normative dimensions, then the organization could place positive weights on those dimensions and ignore other dimensions. This scenario might hold for a firm that primarily hires women and values gender equality. In such cases, the normative concerns present no constraint.

Therefore, we restrict attention to cases in which the expected effect on each normative is negative. To reduce notation, we consider a single firm in a single time period, and that ϕ_i denotes the effect on SDG i . We define **convenient values at level W** to be a set of weights on the normative dimensions, (w_1, \dots, w_N) that sum to W that maximize expected profit.

If firms cannot take purposive actions, and if we assume that the effects on the normative dimensions and profits are independent. Let $F(\pi)$ denote the distribution of profits for actions. We assume that this distribution has support in the interval $[0, \pi^U]$ All actions are profitable. A set of weights (w_1, \dots, w_N) make an profitable action a **socially unacceptable** if profits plus the weighted effects on the normative dimensions are negative. That is, if the social costs given the firm's values outweigh the profits.

$$\pi(a) + \sum_{i=1}^N w_i \phi_i < 0$$

Let Φ denote the distribution across normative dimensions. Given a profit level π and a set of weights w , let $P\Phi(\pi : w)$ denote the probability that an idea with profitability π will not be unacceptable. It follows that the firm wants to choose weights to maximize the probability of having an acceptable action, which can be written as follows:

$$\int_0^{\pi^U} P\Phi(\pi : w) dF(\pi)$$

Purposive Actions

We assume that on each normative dimension, a firm can take purposive actions. If firm f chooses effort e_{fi} on dimension i , then it improves performance on that dimension by e_{fi} . We assume a convex cost structure, with cost $c_{fi}e_{fi}^\alpha$, where $c_i > 0$ captures the relative costs of mitigation efforts on dimension i , and $\alpha_i > 1$ parametrizes the convexity of the costs of purposive effort on that dimension. We assume throughout that there exists variation in the c_{fi} 's, i.e. that there exists an i and a j such that $c_{fi} \neq c_{fj}$. Hereafter, to reduce notation, we drop the f subscript.

Each firm has the following two step optimization problem. First, it chooses optimal purposive effort, it then decides whether or not to take the action. Given all of the separability assumptions, optimal purposive effort does not depend on the action's direct effects, the ϕ_i 's. On each dimension, firm chooses e_i to maximize

$$\omega_i e_i - c_i e_i^{\alpha_i}$$

Taking the derivative gives $e_i = \left(\frac{\omega_i}{\alpha_i c_i}\right)^{\frac{1}{\alpha_i-1}}$. In the special case, where $\alpha_i = 2$, this reduces to $e_i = \frac{\omega_i}{2c_i}$. We can then state our first result.

Result 1. *Firms put more effort on social dimensions that they value more (higher ω_i) that have lower mitigation costs (lower c_i)*

For ease of interpretation, hereafter we restrict attention to the case $\alpha_i = 2$ except when considering the effect of the cost structure. The proofs in the appendix cover the case of general α_i . Two approaches to weighting of natural interest are *equal weights* in which each normative dimension has $\omega_i = \frac{W}{N}$ and *cost based weights* that are chosen inversely proportional to mitigation costs. Equal weights produce a mitigation effort level on normative dimension i equal to the following:

$$e_i^E = \frac{W}{Nc_i}$$

In contrast, *cost based weights* result in the following weight and mitigation effort level on normative dimension i :

$$\omega_i^E = \frac{Wc_i^{-1}}{\sum_{j=1}^N c_j^{-1}}$$

$$e_i^{*E} = \frac{Wc_i^{-2}}{\sum_{j=1}^N c_j^{-1}}$$

Notice that cost based weights result in more effort on dimensions that have lower costs of mitigation.

Regardless of the weights, we assume that a firm chooses to take an action a_i if and only if it increases the firm's objective function given purposive efforts:

$$V(a) = \pi(a) + \sum_{j=1}^N \left[\omega_j \left(\phi_j + \frac{\omega_j}{c_j} \right) - \frac{\omega_j^2}{2c_j} \right] > 0$$

purposive efforts improve the drift on every dimension. Overall, drift on a dimension will be positive if and only if purposive efforts outweigh the sum of the firms' natural drift values. This is totally obvious but important. Less obvious, we can divide firms into two categories:

positive sum-sum and *negative sum-sum*. A firm belongs to the first, respectively second, category if the sum of the net effects across all dimensions is positive (negative). Note that this assumes equal weighting across the dimensions.

Cost Minimizing Purposive Weights

We now explore the implications of firms choosing weights on the normative dimensions so as to minimize the costs of those efforts. For the moment, we fix the sum of weight and set this equal W . The value of W can be seen as a proxy for the social pressure on firms to pursue normative goals. The relative weights on the different dimensions can be thought to reflect the values of the firm.

We also ignore any net zero constraints. We assume that the firm cares only about profits. Thus, it's goal is to choose a set of corporate values, such that if acts optimally given those values, then it will minimize its costs of taking purposive actions. In other words, the firm wants to choose weights on the normative dimensions such that if it acts in good faith given those weights, its cost of doing so will be minimal.

From above, the optimal purposive action on dimension i given weight ω_i and cost coefficient c_i equal $\frac{\omega_i}{c_i}$. Thus, the firm wants to minimize the following:

$$\min_{\{\omega_i\}} \sum_{j=1}^N \left[\omega_j \frac{\omega_j}{c_j} - \frac{\omega_j^2}{2c_j} \right] \text{ s.t. } \sum_{j=1}^N \omega_j = W$$

This can be written as the Lagrangian

$$L(\vec{\omega}, \lambda) = \sum_{j=1}^N \frac{\omega_j^2}{2c_j} + \lambda(W - \sum_{j=1}^N \omega_j)$$

The FONC are as follows: $\omega_i = \lambda c_i$ for $i = 1$ to N and $W = \sum_{j=1}^N \omega_j$. These equations have the solution:

$$\omega_i = \frac{W c_i}{\sum_{j=1}^N c_j}$$

We refer to these weights as the *convenience weights*. Notice that the convenience weights negatively correlate with the cost of purposive effort. Also, notice that, given that firm optimizes given the weights, the amount of purposive effort is the same for every social dimension:

$$e^{*V} = \frac{W}{\sum_{j=1}^N c_j}$$

Which can be simplified as $e^{*V} = \frac{W}{\bar{c}}$, where \bar{c} equals the average mitigation costs.

The next two results follow directly from the characterization of e^{*V} .

Result 2. *If firms can choose corporate values, they put relatively more weight on dimensions with higher marginal costs resulting in less total effort. These convenient values minimize costs spent on purposive efforts.*

Result 3. *If firms adopt convenience weights, technological advancements on a single dimension or a subset of dimensions that lower costs of mitigation produce compensating behavior resulting in a uniform increase in effort on all normative dimensions, as does an increased concern for the normative dimensions overall.*

Intuitively, by placing more weight on those normative dimensions with higher costs of mitigation, convenience weights should result in less total purposive efforts. This can be stated formally.⁴

Result 4. *Total purposive effort is higher under equal weights than cost minimizing purpose weights*

To provide some intuition two dimensional, consider the following two example with quadratic costs in which purposive action on the second dimension has higher costs, $c_2 > c_1$.

⁴Proofs of all results not in the text can be found in the appendix

For convenience assume that the total weight on the two normative dimensions equals $c_1 + c_2$. Under cost minimizing weights, the weight on dimension i equals c_i and the same level of purposive action is taken on each dimensions as shown in the left hand panel of figure 1. If instead, the firm were to place the larger weight w_2 on the dimension 1 which is less costly to do, the firm would put forth much more purposeful effort on dimension one. As can be seen from the right hand panel, total effort across the two dimensions would be higher.

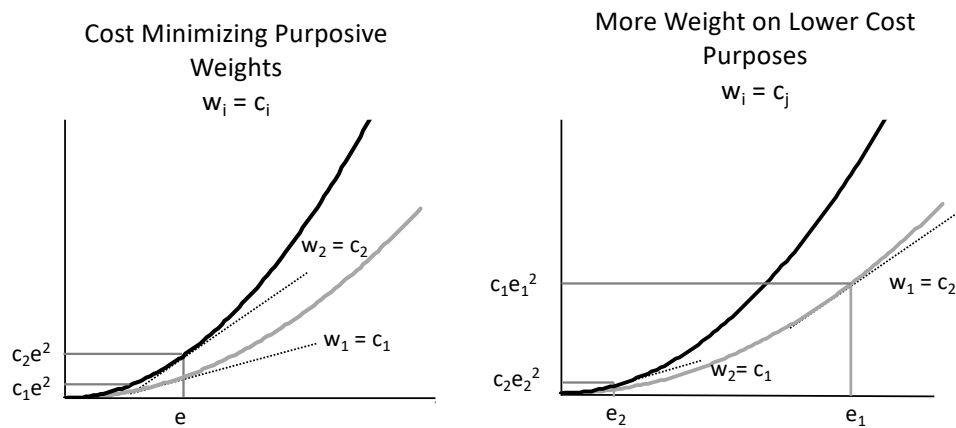


Figure 1: Cost Minimizing Purposive Weighting

It is also the case that convenience weights, as well as equal weights, result in lower total purposive effort than do cost based weights.

Result 5. *Total purposive effort is higher under cost based weights than under equal weights or convenience based weights*

To see the extent of potential differences in total purposive effort. Consider an example with five normative dimensions and $\vec{c} = (12, 6, 3, 2, 1)$. Assume $W = 10$. Equal weighting

implies a weight of two on each dimension and an effort on dimension i equal to $\frac{2}{c_i}$. Total purposive effort on all five dimensions equals $4\frac{1}{6}$. With convenience weighting, effort on each dimension equals $e^* = \frac{10}{25}$, for a total purposive effect across all five dimensions equal to 2. Cost based weighting produces a total purposive effort of $6\frac{7}{10}$.⁵ Thus, equal weighting results in more than double the total purposive effort of convenience weighting and cost based weighting results in more than a tripling of the total purposive effort.

As should be clear from this example, variation in costs of mitigation across the normative dimensions result in larger differences in total purposive effort between the three approaches to weighting though for different reasons. Total purposive effort under convenience weighting depends only on the average cost of mitigation across the N normative dimensions. So, increasing the variation of costs has no effect on total purposive efforts. Under equal weighting, the dimensions with the lowest cost mitigations have a large impact on total mitigation efforts because effort is inversely related to costs on each normative dimension. Under cost based weighting, the dimensions with the lowest costs of mitigation become even more important as effort on those dimensions is proportional to the square of the inverse of costs. For example, if mitigation costs fall by one half for a normative dimension, under equal weighting, the relative effort on that dimension will double; under cost based weighting, effort on that dimension will increase four-fold.

Claim 1. *The more convex the costs, the higher α the less distortion that occurs*

Externalities

Up to now, we have not allowed for externalities. The original literature on externalities relied heavily on examples of local externalities, with small numbers of people effected (Arrow 1970). In the current context, many of the externalities have global or at least regional effects. Efforts

⁵The explicit calculation are as follows. Equal weighting gives the following effort levels on the five normative dimensions $(\frac{1}{6}, \frac{1}{3}, \frac{2}{3}, \frac{1}{3}, \frac{2}{3})$. Cost based weighting gives weights $(\frac{2}{5}, \frac{4}{5}, \frac{8}{25}, \frac{12}{5}, \frac{24}{5})$, and effort levels $(\frac{1}{30}, \frac{4}{30}, \frac{16}{30}, \frac{36}{30}, 4\frac{24}{30})$, which some to a total purposive effect of $6\frac{7}{10}$.

to improve education and health can reduce poverty at a national level. Efforts to increase economic well being or subsidize public infrastructure that increase carbon in the atmosphere contribute to climate change, a global effect.

We now assume that when a firm takes an effort e_i on dimension i it creates externalities equal to $e_i\psi_{ij}$ on dimension j . To emphasize the global nature of the SDGs, we will assume these externalities are global. Given a set of weights ω on the N normative dimensions, the firm's optimal effort satisfies the following expression.

$$\omega_i + \sum_{j \neq i} \omega_j \psi_{ij} = 2e_i c_i$$

Solving gives that effort on dimension i is proportional to the total normative effect of effort, the *direct effect*, ω_i and the weighted sum of the *indirect effects*, divided by the costs

$$e_i = \frac{\omega_i + \sum_{j \neq i} \omega_j \psi_{ij}}{2c_i}$$

To solve for the cost minimizing purposive weight given externalities, we construct a Lagrangian. The result is given in the next claim

Claim 2. *When purposive actions create externalities, cost minimizing purposive weights satisfy the following equation*

$$w_i = \frac{c_i}{1 + \sum_{j \neq i} \psi_{ji} \frac{c_i}{c_j}}$$

The π_{ji} terms in the denominator imply that the weight on dimension i depends on the externalities that other actions would create on dimension i . If these terms are large and positive then other actions create positive externalities with dimension i . Thus, in order to be consistent to its values, the firm would have to take actions on those dimensions, which would be costly. So, the firm wants to place weight on dimensions that are both high cost and for which other actions do not create large positive externalities. We can state this as a

corollary.

Corollary 1. *The cost minimizing purposive weight on dimension i when externalities exist increases in the cost of purposive action and decreases in the aggregate positive externalities that actions directed at other dimensions create for dimension i .*

Convenient Values with Net Zero Constraints

The addition of net zero constraints implies that some firms will need to increase efforts on those dimensions. We assume a single net zero constraint on dimension 1 as the extension to more follows directly. Firms now face the following problem when choosing values.

$$\min_{\{\omega_i\}} \sum_{j=1}^N \left[\omega_j \frac{\omega_j}{c_j} - \frac{\omega_j^2}{2c_j} \right] \text{ s.t. } \sum_{j=1}^N \omega_j = W + \lambda_1(\phi_i - e_y)$$

This can be written as the Lagrangian

$$L(\vec{\omega}, \lambda) = \sum_{j=1}^N \frac{\omega_j^2}{2c_j} + \lambda(W - \sum_{j=1}^N \omega_j)$$

The FONC are as follows:

$$\omega_1 = \lambda c_1 + \lambda_1$$

$$\omega_i = \lambda c_i \text{ for } i = 2 \text{ to } N$$

$$W = \sum_{j=1}^N \omega_j \tag{1}$$

$$e_1 = \phi_1$$

Assuming that the fourth constraint binds, gives that $\phi_1 = \frac{\omega_1}{c_1}$, so that $\omega_1 = \frac{\phi_1}{c_1}$ and for $i = 2$ to N

$$\omega_i = \frac{\hat{W}c_i}{\sum_{i=2}^N c_i}$$

where $\hat{W} = W - \frac{\phi_1}{c_1}$. Put in less formal terms, a firm that adopts convenient values will place just enough weight on the normative dimension with the net zero constraint in order to meet that constraint. It will then allocate the remaining weight across the other dimensions so that weight is inversely proportional to costs. Leading to fifth result.

Result 6. *If firms adopt convenient values, the imposition of net zero constraints will reduce progress on other normative dimensions uniformly.*

Net zero constraints cause firms to espouse values that place substantial weight on those dimensions. The firms values respond to the constraints.

Adding Dimensions

We now analyze the effects of increasing the number of normative dimensions. We derive three results. First, we show that if firms choose convenient values, then adding new dimensions reduces total effort iff and only if the new dimensions have higher average costs of mitigation. Second, we show that if the new dimensions have low costs of mitigation, and if firms choose convenient values, then adding new dimensions will have almost no effect on firm behavior overall. Third, we derive a condition on a new dimension that imposes a net zero constraint then results for their to exist higher overall mitigation efforts.

Introducing new normative dimensions causes firms to spread their mitigation efforts across more dimensions. If firms choose convenient values, then from above, we know that the higher the costs of mitigation on these new dimensions, the more weight those dimensions will receive. Assume K new dimensions are added with costs c_{N+i} for $i = 1$ to K . Given our assumption that the firm chooses convenience values, the effort on dimension i equals W over the sum of the costs. Let $c(\bar{N})$ and $c(N+K)$ equal the average mitigation costs

for N and $N + K$ dimensions. The previous inequality can be rewritten as follows: It follows that total purposive effort after adding new dimensions increases if and only if the following holds:

$$\frac{W}{c(N+K)} \geq \frac{W}{c(\bar{N})}$$

Which is equivalent to $c(\bar{N}) \geq c(N+K)$, implying the next result.

Result 7. *Adding normative dimensions increases total purposive effort if firms adopt convenient values if and only if the new dimensions have lower than average costs of mitigation than the existing dimensions.*

As an example, suppose that $W = 40$ and there exists ten current dimensions with an average cost of two. Purposive effort on each dimension equals two, and total purposive effort equals twenty. Suppose that we add five new dimensions with an average cost of one. Each of the five new dimension will receive less weight ($\frac{40}{25}$) than the ten initial dimensions ($\frac{80}{25}$) purposive effort on each dimension will equal one and two-thirds, and total purposive effort will increase to twenty-five: 25% increase. Alternatively, suppose that each of the five new dimensions has cost of four. Each new dimension, now receives more weight (4), than the initial dimensions (2). purposive effort on each dimension equals one, so total purposive effort equals fifteen: a 25% decrease.

Current Impact Weights and Relative Cost Impact Weights

We next consider a benevolent social planner who chooses to maximize impact by attaching more weight to dimensions on which less progress has been made. Define the current importance of dimension i at time t to equal total global progress divided by progress on that dimension: $\gamma_{it} = \frac{G_t^\Sigma}{g_{it}}$. Let Γ_t equal the sum of the γ_{it} 's. We define *current relative impact* of dimension i at time t , ω^{it} to be proportional to the relative progress on that dimensions:

$$\omega_{it}^M = \frac{W\gamma_{it}}{\Gamma_t}$$

It follows from above that a firm maximizing current relative impact will choose effort on dimension i at time t equal to:

$$e_{it}^{*M} = \frac{\gamma_{it} W}{\Gamma_t c_i}$$

Alternatively, a benevolent social planner might take into account the costs of purposive efforts on each dimension and set and assign weights relative to the ratio of γ_{it} and c_i . Let

$$\Psi_t = \sum_{j=1}^N \frac{\gamma_{jt}}{c_j}$$

Then define *relative cost impact weights* as follows:

$$\omega_{it}^{MC} = \frac{W \gamma_{it}}{\Psi_t c_i}$$

A firm maximizing cost weighted impact will therefore choose effort on dimension i at time t equal to:

$$e_{it}^{CM} = \frac{W \gamma_{it}}{\Psi_t c_i^2}$$

Dynamic Comparison of Mitigation Weights

We now compare the effects of different value based mitigation policies in dynamic environments using numerical simulations. We consider the five possible types of weighting approached described so far: *equal weights*: all dimensions receive equal weights; *cost based weights*: all dimensions receive equal weights inversely proportional to their costs of mitigation; *convenience weights*: firms choose weights to maximize profits; *current impact weights*:

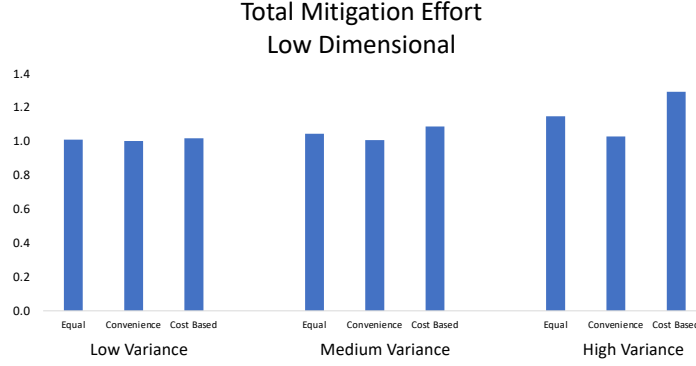


Figure 2: Mitigation Efforts Under Equal, Convenient and Cost Based Weights: Five Dimensions (400 Trials)

firms place weight on dimensions on dimensions inversely proportional to relative progress; and *relative cost impact weights* : firms place weight on dimensions inversely proportional to cost weighted relative progress.

From above, the weights, purposive efforts on each dimension, and the total purposive effort across all of N normative dimensions are given in the following table:

Weighting	Weight on Dim i	Effort on Dim i	Total purposive Effort
<i>Equal</i>	$\frac{W}{N}$	$\frac{W}{Nc_i}$	$\sum_{j=1}^N \frac{W}{Nc_j}$
<i>Cost Based</i>	$\frac{Wc_i^{-1}}{\sum_{j=1}^N c_j^{-1}}$	$\frac{Wc_i^{-2}}{\sum_{j=1}^N c_j^{-1}}$	$\frac{\sum_{j=1}^N Wc_j^{-2}}{\sum_{j=1}^N c_j^{-1}}$
<i>Convenience</i>	$\frac{Wc_i}{\sum_{j=1}^N c_j}$	$\frac{W}{\sum_{j=1}^N c_j}$	$\frac{W}{\bar{c}}$
<i>Current Impact</i>	$\frac{W\gamma_{it}}{\Gamma_t}$	$\frac{\gamma_{it} W}{\Gamma_t c_i}$	$\sum_{j=1}^N \frac{W\gamma_{jt}}{\Gamma_t c_j}$
<i>Relative Cost Impact</i>	$\frac{W \gamma_{it}}{\Psi_t c_i}$	$\frac{\gamma_{it} W}{\Psi_t c_i^2}$	$\sum_{j=1}^N \frac{W\gamma_{jt}}{\Psi_t c_j^2}$

We consider six scenarios corresponding to three levels of cost variation: *low*, *medium* and *high*; and two levels of dimensionality: *low* ($N = 5$) and *high* ($N = 15$). We begin by considering a single firm. We assign mitigation costs using a Normal distribution with mean one and different standard deviations: ($\sigma = 0.1$ for low variation, 0.2 for medium variation,

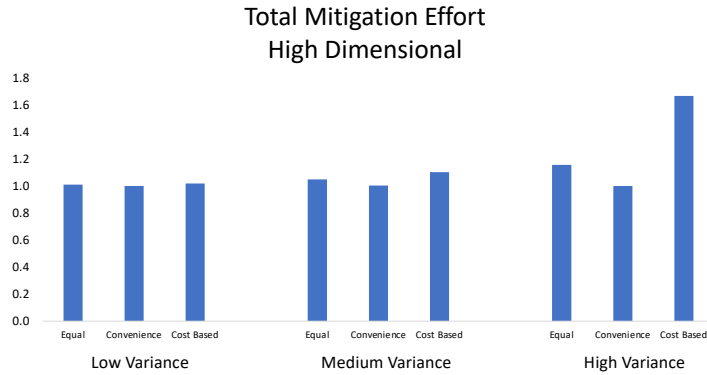


Figure 3: Mitigation Efforts Under Equal, Convenient and Cost Based Weights: Fifteen Dimensions (400 Trials)

and 0.33 for high variation.⁶ . The charts below shows amount of total mitigation across four hundred runs. All differences are statistically significant to 1%.

As can be seen from the figures, under low variance costs, convenience weighting has little effect in either setting. Under high variance costs, in the low dimensional setting, convenience weights result in 15% less mitigation than equal weights and 30% less than cost based weights. In the high dimensional setting, those effect sizes approximately double. Convenience weights produce a sixty percent decrease in mitigation efforts.

Net Zero Constraints

Regulations may require the net effect on a dimension to be non negative: a *net zero constraint*. For a given action, three possibilities exist. First, optimal mitigation may have a positive net effect: $(\phi_i + \frac{\omega_i}{c_i}) > 0$. Second, *net zero effort* may, though not optimal, improve the firm's objective: $(\omega_i \phi_i - \frac{1}{2} c_i \phi_i^2) > 0$. Third, net zero effort may lower the firm's objective.

⁶We took the absolute value of the draw of a cost from the distribution to avoid negative mitigation costs. The odds of a negative draw are much less than 1% and any negative draw has likely has a small absolute value. Though this introduce a slight asymmetry, it's effect on average effects is negligible.

Only in the first case, does the constraint have no effect on the firm's objective. In the other two cases, the net zero constraint lowers firm profits, leads to fewer actions being taken, and to better performance on the net zero social issue (again all obvious). Less obviously, if the net zero disproportionately constrains *positive sum-sum* firms, the overall effect could be negative. We can then state result two.

Result 8. *Net Zero Constraints reduce the set of actions taken, improve performance on the dimension to which they are applied, but can lower overall performance on other dimensions by preventing firms from taking actions.*

To see how net zero constraints could hinder progress on other dimensions, suppose that there exist firms for whom achieving the net zero constraint on dimension i produces negative profits, but the firm's action plus its purposive efforts would have, on net, produced positive contributions on the normative dimensions.

Appendix

Proof of Result 4: We first state a lemma.

Lemma 1. *Given any real numbers x_i for $i = 1$ to N , where \bar{x} equal the mean of the x_i 's.*

$$\frac{1}{N} \sum_{i=1}^N \frac{1}{x_i} > \frac{1}{\bar{x}}$$

The proof of the lemma follows from the convexity of the function $\frac{1}{x}$ and Jensen's inequality. Substituting in c_i for x_i in the lemma and multiplying both sides by W gives

$$\frac{1}{N} \sum_{i=1}^N \frac{W}{c_i} > \frac{W}{\frac{1}{N} \sum_{i=1}^N c_i}$$

which completes the proof.

Proof of Result 5: Given Result 4 it suffices to show

$$\frac{\sum_{j=1}^N W c_j^{-2}}{\sum_{j=1}^N c_j^{-1}} > \frac{W}{N} \sum_{j=1}^N \frac{1}{c_j}$$

Let $z_j = \frac{1}{c_j}$. The previous inequality can then be written as follows:

$$\frac{\sum_{j=1}^N W z_j^2}{\sum_{j=1}^N z_j} > \frac{W}{N} \sum_{j=1}^N z_j$$

Dividing both sides by W and multiplying the right hand side by the denominator of the left hand side gives

$$\sum_{j=1}^N z_j^2 > \frac{1}{N} \left(\sum_{j=1}^N z_j \right)^2$$

Let \bar{z} equal the mean of the z_j 's. The previous inequality can be rewritten as

$$\sum_{j=1}^N z_j^2 > N \bar{z}^2$$

which follows from the convexity of the function x^2 .

Discussion

Social, political, and financial pressure along with employees' preferences to do good create pressure on firms to adopt social, environmental, and good governance objectives. Successful inclusion of these other goals requires a coherent firm level strategy. A firm must clarify its objective function. A coherent multiple objective mission serves two purposes. It guides managerial decision making. People within the firm know how to make decisions that trade off the various goals, and it provides criteria for external evaluators.

These additional goals reallocate attention. That reallocation can result in win-wins: actions that are good for the environment, society, and the firm's bottom line. More often than not, this will not be the case. Including environmental and social objectives will reduce profit. Market logic suggests that if going green and creating greater equity produced higher profits, then firms would not be feeling this external and internal pressure.

That pressure to do good comes with some flexibility to firms. The enormous number of possible social and environmental concerns provides a menu of options. We can expect that firms might choose items from that menu for a variety of reasons. Branding might be one reason. A firm might choose non financial goals that align with their brand. Here, we focus on economic incentives. We assume that firms want to choose non financial objectives that have minimum effects on profits. We show, contrary to intuition, that firms will choose to value objectives in which their efforts to make progress is costly. Thus, the freedom to choose objectives reduces the effects of these pressures.

We conclude with comments on the convenient values and on the likely empirical support for our claims along with an institutional question. First, the convenient values assumptions stems from our adopting the standpoint of economics and not from cynicism. We are not

saying that firms are evil actors. We are arguing that they behave according to standard economic logic. That logic implies that external and internal pressures to do good will not eradicate market forces. Selection will still occur at the level of profits. Firms that include other goals with minimal effect on profits should be more likely to survive and more likely to grow.

The empirical question relates to the magnitude of the effects of allowing firms to choose their values. We made no effort to calibrate our model. Our theoretical results produce hypotheses that the effects size will increase in the level of pressure and in the size of the menu of possible concerns. We would expect that both of those would stand up to empirical scrutiny. Yet, given brand considerations and the difficulty of knowing firms' costs functions for mitigating activities, we expect that evidence that firms do *exactly* what we theorize would be less strong.

The institutional puzzle concerns whether there should exist common criteria. Our results would seem to suggest that we would argue for common criteria as this would reduce the distortions from firm's choosing convenient values. We are hesitant to jump to that conclusion as it presumes the optimality or at least satisfactoriness of the criteria. The United Nations Sustainable Development goals emerged from a messy, politically charged process. The various standards that emerge from the investment community did as well. Both represent the imposition of values by elites. While convenient values reduce the amount of impact, they will also be biased towards the interests of consumers and workers. A more detailed model of profits would show that firms' values will be biased toward those of consumers and workers. Aligned values should result in higher sales and, potential, lower wage bills. To the extent that consumers and workers care about the specific actions of firms and not just whether an aggregate ESG or SDG score exceeds a threshold, convenient values will greater align with the values of the population.

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