Chapter 13

The Cost of Capital Misallocation to ESG Investments with an Environmental Focus

A large body of finance literature establishes that corporations exist to maximize shareholder value (e.g., Modigliani and Miller 1958; Friedman 1970; Meckling and Jensen 1976; Fama and Jensen 1983; Shleifer and Vishny 1997). Under U.S. State and Federal laws, fiduciary duty—encompassing care (including prudence) and loyalty—requires corporate directors and asset managers (fiduciaries) to maximize risk-adjusted returns for their shareholders and investors, respectively. Corporate directors are obliged by State corporate laws (primarily those of Delaware) and Federal laws for public companies, including the Securities Act of 1933 and the Securities Exchange Act of 1934; asset managers are obliged by Federal law, including the Investment Advisers Act of 1940 and the Employee Retirement Income Security Act of 1974. In *Fifth Third Bancorp v. Dudenhoeffer* (2014), the U.S. Supreme Court held that fiduciary investment decisions must be made for the sole purpose of maximizing risk-adjusted returns.

The rise in environmental, social, and governance (ESG) investing over the past decade has sparked a controversy over whether corporate directors and asset managers are in breach of their fiduciary duty when nonpecuniary ESG factors influence investment decisions. An important economic implication is that capital misallocation to ESG investments reduces investment efficiency and constrains aggregate economic growth.

In this chapter, the CEA quantifies the extent of capital misallocation to environmentally-focused ESG investments and the corresponding loss of gross domestic product (GDP). The CEA's estimates show that, between 2016 and 2023, the systemic misallocation of financial capital to environmentally-focused (or "green") investments reduced U.S. GDP by $98 billion to $196 billion, or an average of about 0.07 percent of GDP per year. Of total output losses that can be attributed to capital misallocation in the United States over the period 2016–23, environmentally-focused ESG investments account for about 10 percent. The CEA's findings point to a significant cost to investors and the broader economy from ESG investments. Consistent with these findings, it is expected that the Trump Administration's steps to eliminate nonpecuniary ESG factors from investment decisions has the potential to raise U.S. GDP and benefit all Americans.

The Rise of ESG Investing and Resulting Capital Misallocation

Over the past decade, ESG investing has expanded rapidly, driven by fiduciary-imposed ESG constraints to prioritize nonpecuniary environmental, social, and governance factors. Among the key reasons for this shift is the Paris Agreement (United Nations 2015), which the United States and 194 other parties adopted on December 12, 2015, pledging to reduce greenhouse gas emissions and limit global warming.[1]

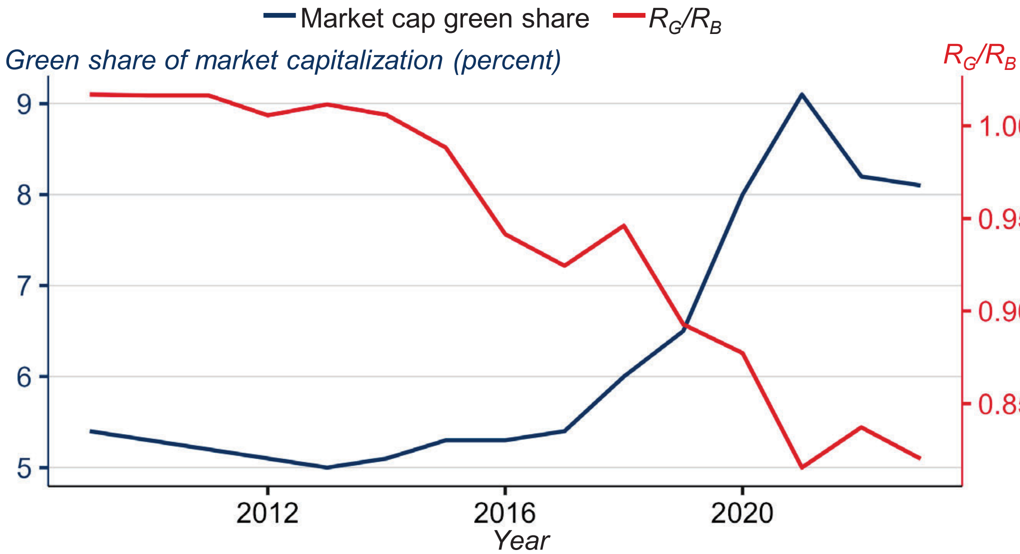
ESG encompasses environmental (E) factors, such as emissions and natural resource use; social (S) factors, such as labor standards and diversity, equity, and inclusion (DEI); and governance (G) factors, such as the independence of boards of directors and shareholders' rights. While governance factors have long played an important role in investment decisions in the United States, the sharp increase in environmental activism has been rather recent (Agoraki et al. 2025). This chapter focuses on the environmental factor of ESG investing, since it is more accurately measured relative to the social or governance factors and has been the focus of most of the academic literature on ESG.[2]

Around 2016, a significant segment of institutional investors—including sovereign wealth funds, pension funds, and ESG-dedicated asset managers—became willing to accept lower expected returns in exchange for ESG exposure,

[1] Under both Trump Administrations, the United States formally withdrew from the Paris Agreement—initially in November 2020 after the 2017 announcement under the first Trump Administration, and subsequently in January 2025 under the second Trump Administration—reversing the U.S. engagement in international climate commitments and signaling a retreat from multilateral climate governance.

[2] For example, carbon emissions and energy use under the environmental factor are easier to measure relative to employee well-being under the social factor or board independence under the governance factor.

Figure 13-1. Green Share of Market Capitalization and Green-to-Brown Return Ratio, 2009–23



Sources: LSEG 2025; Gormsen, Huber, and Oh 2025; CEA calculations.
Note: R_G/R_B = the cost of "green" capital (R_G) relative to the cost of "brown" capital (R_B). The green share of market cap is from LSEG (2025) and the ratio of green to brown costs of capital is from Gormsen, Huber, and Oh (2025).

thereby bidding up ESG valuations above fundamentals (Barber, Morse, and Yasuda 2021; Geczy, Stambaugh, and Levin 2021). A key driver of institutional flows into ESG has been guidance from the U.S. Department of Labor (DOL 2015), issued on October 26, 2015, suggesting that consideration of ESG factors in investment decisions is not incompatible with fiduciary duties under the Employee Retirement Income Security Act of 1974.

Figure 13-1 shows that, since 2016, the cost of "green" capital (R_G) has declined relative to the cost of "brown" capital (R_B), while the green share of the global stock market has significantly increased. In theory, pricing distortions would not persist in an efficient and competitive market because arbitrageurs who do not face ESG pressure would offset higher green valuations by shorting green assets and overweighting brown assets until green and brown returns converged.

In practice, however, several frictions constrain these arbitrage forces and allow ESG distortions to persist. First, institutional investors face mandates, benchmarking constraints, and reputational concerns that place limits on their brown exposure (Pástor and Vorsatz 2020). Second, information and measurement frictions lead ESG ratings to diverge sharply across providers. This divergence introduces uncertainty about what is truly "green" or "brown" and increases the cost of arbitrage (Berg, Kolbel, and Rigobon 2022). Third, ESG flows are slow-moving—private funds respond slowly to price changes—due to regulatory and liquidity constraints (Pástor, Stambaugh, and Taylor 2022). Fourth, persistent transition risks, such as uncertain climate policies and technological disruption, sustain a carbon premium on brown firms (Bolton and Kacperczyk 2021), reinforcing return differentials. As a result, even if an arbitrage opportunity exists in the short run, firms may choose not to act on the opportunity due to long-run policy uncertainties.

Because ESG-driven demand introduces a structural distortion in asset prices that is not easily undone by arbitrage, nonpecuniary demand for ESG assets distorts the allocation of capital. As investors pay more for ESG assets, despite receiving equivalent cash flows from brown assets, ESG asset prices rise above fundamentals, lowering expected returns and financing costs. As a result, firms with higher ESG scores benefit from a lower cost of capital relative to non-ESG or carbon-intensive firms. An ESG premium (or "greenium") arises from the systematic difference in expected returns and financing costs between green and brown assets. By reducing the financing costs of ESG firms, the premium directs capital toward ESG or environmentally-aligned activities, regardless of their relative productivity. Meanwhile, highly productive brown firms face higher financing costs, which constrains investment and dampens overall efficiency. This wedge between financial valuations and productive efficiency results in the misallocation of capital and, over time, reduces long-run GDP.

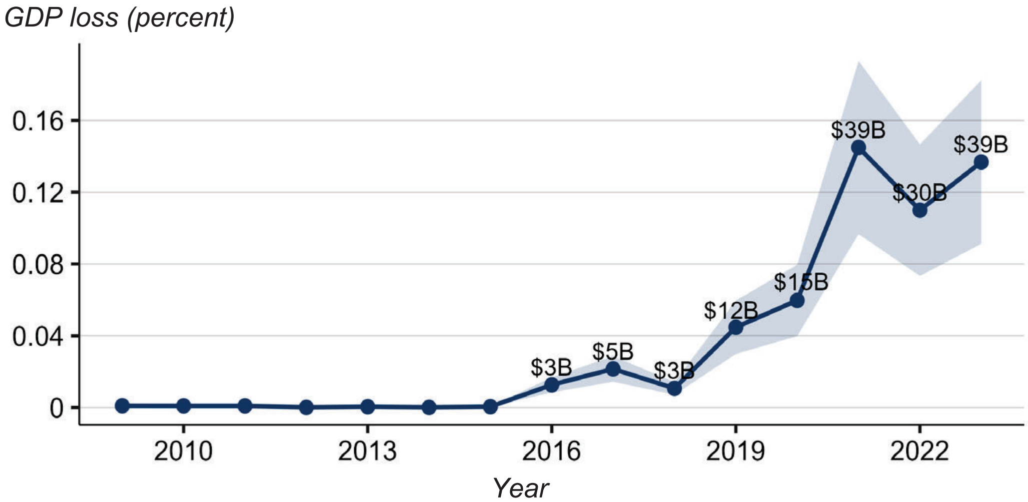
Estimating Output Losses and the Share of U.S. Capital Misallocation from Environmentally-Focused ESG Investments

In this section, the CEA estimates output costs from capital misallocation to environmentally-focused ESG investments and quantifies their share of total capital misallocation for the U.S. economy.

Output Losses

The calculations here utilize a static model with two sectors: a real sector and a financial sector. The real sector produces output using labor that is inelastically supplied from households and two types of capital: green and brown. These two types of capital are imperfect substitutes, differing only in their relative importance for producing capital. The financial sector represents large financial institutions and allocates a unit supply of capital between green and brown capital. The real sector interacts with the financial sector such that the real sector's demand for capital depends on the financial sector's pricing of each capital type. An important feature of the model is that the financial sector's demand for green assets drives a wedge in green-brown financing costs that is independent of productivity. In particular, the financial sector's demand for green assets drives a higher price and, in turn, a lower financing cost for green capital. As green capital becomes cheaper to finance relative to brown capital,

Figure 13-2. Estimated Output Losses from Capital Misallocation to Environmentally–Focused ESG Investments



Source: CEA calculations.
Note: B = billions. For calculation details, see the appendix to this chapter. Data labels are GDP losses reported in billions of 2024 dollars. The range of shaded values is for the elasticity of substitution between green and brown capital, σ = [2,4].

firms use more green capital, which distorts the overall allocation of capital in the economy. The disconnect between financial valuations and productive efficiency due to the financial sector's demand for green assets results in capital misallocation that generates output losses.

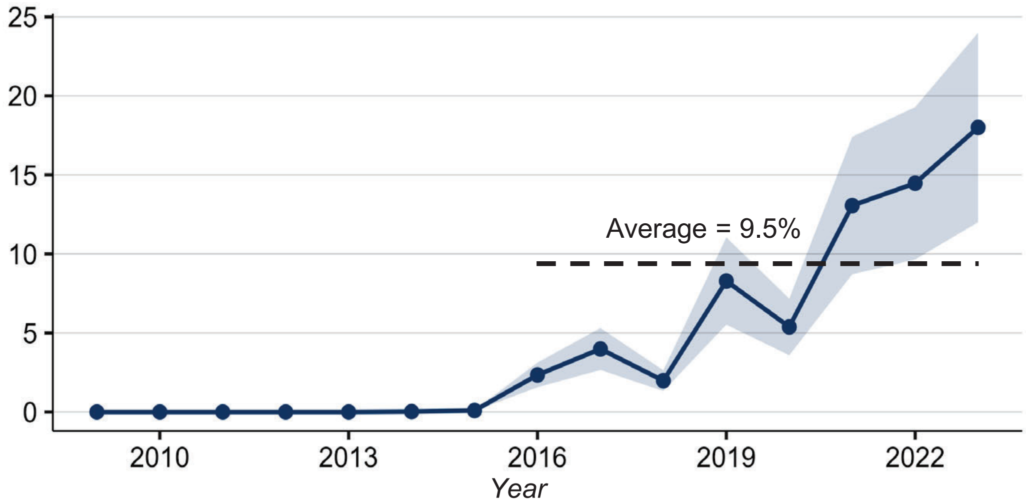
Figure 13-2 shows CEA-estimated output losses from capital misallocation to environmentally-focused ESG investments. From 2016 to 2023, it is estimated that capital misallocation to environmentally-focused ESG investments generated output losses of $146 billion, about 0.5 percent of U.S. GDP in 2024. Using a range for the elasticity of substitution between green and brown capital, the implied range of output costs is $98 billion to $196 billion or about 0.07 percent of GDP per year on average. (See the appendix to this chapter for a full description of the model environment, equilibrium conditions, and parameter calibration that underpin figure 13-2's estimates.)

Share of Total U.S. Capital Misallocation

In the canonical misallocation literature, capital misallocation arises when dispersion in firms' effective costs of capital prevents the equalization of the marginal products of capital across firms. When the effective cost of capital varies across firms for nonproductivity reasons, capital flows toward lower-cost rather than higher-productivity uses, leading to lower aggregate productivity and total output (Hsieh and Klenow 2009; Restuccia and Rogerson 2017). Building on this framework, Faria-e-Castro, Kozlowski, and Majerovitz (2025) estimate the extent of capital misallocation in the United States by calculating a firm-level social cost of capital—the opportunity cost to society of deploying an additional

Figure 13-3. Estimated Share of Total U.S. Capital Misallocation from Environmentally–Focused ESG Investments

Share of misallocation from environmentally–focused ESG investments (percent)



Source: CEA calculations. The denominator comes from Faria-e-Castro, Kozlowski, and Majerovitz (2025, figure 4).
Note: For calculation details, see the appendix to this chapter. The range of shaded values is for the elasticity of substitution between green and brown capital, σ = [2,4].

unit of capital efficiently. Using the dispersion in the social cost of capital across firms as a measure of misallocation, Faria-e-Castro, Kozlowski, and Majerovitz (2025) estimate that output loss due to capital misallocation is 0.5 to 1 percent in the United States—a small loss compared with those of other countries.[3]

Figure 13-3 benchmarks CEA-estimated output losses due to capital misallocation from environmentally-focused ESG investments against total capital misallocation estimated in the United States. Faria-e-Castro, Kozlowski, and Majerovitz (2025) estimate that capital misallocation cost the United States, on average, 0.54 percent of GDP over the period 2014–19, 1.11 percent over 2020–21, and 0.76 percent over 2022–23. CEA-estimated output losses from environmentally-focused ESG investments account for a significant and steadily increasing share of total U.S. capital misallocation (figure 13-3). In particular, the CEA estimates that the share of total U.S. capital misallocation from environmentally-focused ESG investments reached an all-time high of about 20 percent in 2023 and averaged about 10 percent over 2016–23.

[3] See Faria-e-Castro, Kozlowski, and Majerovitz (2025) for the 0.5–1 percent estimate and a comparison between the United States, Mexico, Brazil, and Pakistan. See Bartelsman, Haltiwanger, and Scarpetta (2013) for a comparison between the United States and Europe, and see Hsieh and Klenow (2009) for a comparison between the United States, China, and India.

The Administration's Efforts to Eliminate Capital Misallocation to ESG Investments

The Trump Administration has issued a series of Executive Orders designed to limit the influence of nonpecuniary ESG factors in investment decisions that come at a cost to investors and the U.S. economy. First, the Administration rescinded climate and environmental regulations that enabled capital to flow based on environmental signaling rather than expected financial returns (White House 2025a). Second, the Administration withdrew the United States from the Paris Agreement and other international climate commitments, weakening the regulatory and policy infrastructure supporting the environmental criteria in ESG investing (White House 2025b). Third, the Administration ended Federal DEI programs that encouraged socially motivated investment (White House 2025c). Fourth, the Administration mandated regulatory review of proxy advisory firms' ESG and DEI recommendations, limiting the influence of nonfinancial factors in shareholder voting and fiduciary investment decisions (White House 2025d).

After the Administration issued its pertinent Executive Orders, financial regulatory agencies such as the U.S. Securities and Exchange Commission (SEC) and DOL implemented regulatory actions to operationalize limits on nonpecuniary ESG investment. For example, the SEC ceased defending its 2024 climate disclosure rule in court in March 2025 and withdrew its proposed ESG-related regulations in June 2025, including enhanced ESG fund disclosures and shareholder proposal reforms—effectively rolling back mandatory climate risk transparency and weakening the influence of ESG factors on investment decisions. Meanwhile, DOL withdrew its defense of the ESG fiduciary rule for retirement plans in May 2025 (Miller & Chevalier 2025), effectively rescinding its 2022 ESG guidance—signaling a shift toward a skeptical stance on ESG investing under the Employee Retirement Income Security Act.

Conclusion

Since 2016, the rise of ESG investing due to fiduciary-imposed ESG constraints has distorted the allocation of capital, imposing a significant cost on investors and the broader U.S. economy. The CEA estimates that, from 2016 to 2023, the cumulative output loss from environmentally-focused ESG investments alone cost the U.S. economy about $98 billion to $196 billion. The estimated output losses from environmentally-focused ESG investments constitute a significant and growing share of total U.S. capital misallocation, reaching an all-time high of about 20 percent in 2023 and averaging about 10 percent over the period 2016–23. The CEA's estimates represent a lower bound on the true extent of output loss and capital misallocation due to ESG investing since it only quantifies the environmental component of ESG; there may be additional losses from the social and governance components.

Recognizing the substantial cost of capital misallocation to ESG investments, the Trump Administration has already taken important steps to eliminate the influence of nonpecuniary ESG factors on investment decisions. Moreover, financial regulatory agencies have taken regulatory actions and issued guidance, consistent with their fiduciary duty under U.S. State and Federal laws, that investment decisions should solely be based on risk-adjusted financial returns. These important steps, and future actions under the current Administration aimed at directing capital to its most productive use, will reduce costly misallocations from ESG investing, improve economic efficiency, and raise the living standards for both working and retired Americans.

Appendix: Quantifying Output Losses from ESG Investments with an Environmental Focus

This appendix describes the model and parameter calibration used to quantify the output losses that can be attributed to environmentally-focused ESG investments.

An Overview of the Model

To quantify the effect of capital misallocation to environmentally-focused (or green) ESG investments, the CEA studies a static economy with two sectors. The real sector produces output by combining labor with two types of physical capital (green and brown). Real demand for capital interacts with the financial sector's pricing of each capital type. The financial sector owns claims to the cash flows of each type of capital. A representative household owns the firm and all financial claims, and supplies labor inelastically to the firm. The CEA abstracts from households in this model to enable one to focus on how the financial sector's demand for green assets leads to production inefficiency through distortions in the cost of capital.

The real economy. A representative firm produces homogeneous output using a Cobb-Douglas production function $Y = K^{\alpha}L^{1-\alpha}$. The price of output is normalized to 1. Households supply 1 unit of labor, L, inelastically. K is a constant elasticity of substitution aggregator of green and brown capital, K_G and K_B. Firms face a perfectly elastic supply of capital services at the prevailing user costs of capital r_G and r_B. These prices are endogenous equilibrium objects set in the financial market but are taken as given by the firm.

The firm first determines the optimal mix of green and brown capital, and then how much output to produce. Taking capital costs as given, the firm solves a cost-minimization subproblem to determine the optimal mix of green and brown capital:

$$\min_{K_G,K_B} r_G K_G + r_B K_B \text{ subject to} \left(\theta^{1/\sigma} K_G^{\frac{\sigma-1}{\sigma}} + (1-\theta)^{1/\sigma} K_B^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}} = 1. \tag{1}$$

The solution to equation 1 determines the optimal mix of green and brown capital for any given level of aggregate capital. There are two key parameters. First, θ determines how prevalent green capital is in production. In practice, the green share of the total capital stock is not very large. Second, the elasticity of substitution σ governs how easily firms can substitute green for brown capital. When $\sigma = 0$, green and brown capital types are perfect complements and firms will use both types in constant proportions. The higher σ is, the more easily a firm can reallocate toward the cheaper type of capital, with green and brown becoming perfect substitutes as $\sigma \to \infty$. For instance, if it became cheaper to finance green investments and σ is large, then firms would substitute toward more green capital. The solution to equation 1 yields the optimal ratio of green to brown capital, given the rental rates:

$$\frac{K_G}{K_B} = \frac{\theta}{1-\theta}\left(\frac{r_B}{r_G}\right)^{\sigma}. \tag{2}$$

Here, the CEA is primarily interested in how dispersion in the cost of capital leads to production inefficiency by inducing firms to use more green capital than they otherwise would because it is artificially cheaper. The wedge in the cost of capital is defined as:

$$\tau \equiv \log r_B - \log r_G.$$

This wedge is interpreted as a kind of tax on brown capital. As determined by Hsieh and Klenow (2009), the tax leads to dispersion in observed returns, which distorts production. To see why, note that one can write the price index of aggregate capital as:

$$P_K = r_B\big(\theta \exp\{-(1-\sigma)\tau\} + (1-\theta)\big)^{\frac{1}{1-\sigma}}. \tag{3}$$

At $\tau = 0$, firms have no incentive to increase the use of either type of capital. This means that the input mix is efficient and the price of aggregate capital is minimized. When $\tau \neq 0$, relative rental rates diverge and—because there is imperfect substitutability between green and brown capital—firms cannot fully reallocate toward the cheaper type of capital. As a result, the aggregate price of capital is inefficiently high and firms use more green capital than if there was no price dispersion. This matters for output, which is given by:

$$Y = \left(\frac{\alpha}{P_K}\right)^{\frac{\alpha}{1-\alpha}}. \tag{4}$$

When τ rises, because brown capital becomes expensive to rent relative to green, the aggregate price index rises; that is, aggregate capital becomes more expensive. When capital becomes more expensive, firms use less of it, which causes output to fall. The resulting output loss due to misallocation is:

$$L(\tau) = 0.5 \cdot \alpha \cdot \sigma \cdot \theta(1-\theta) \cdot \tau^2. \tag{5}$$

The GDP loss depends on four forces. The capital share α scales the importance of capital in production. Misallocation is costlier when capital is more important. When $\tau \neq 0$, a higher elasticity of substitution between capital types, σ, leads to larger distortions in the capital mix and amplifies GDP loss. Finally, the wedge, τ, captures dispersion in capital costs, with output loss increasing quadratically in its size. The wedge is costly for any kind of price dispersion between brown and green capital, not just when brown capital is more expensive. The CEA does not explicitly model household behavior, and simply assumes that households consume all output. In this case, welfare changes are proportional to the changes in output given by equation 5.

The financial sector. The wedge in user cost comes from a preference term that penalizes exposure to brown capital that can be viewed as a stand-in for fiduciary-imposed ESG constraints.[4] Investors own the claims to capital's cash flows. Holding 1 unit of the claim on type *i* entitles them to the flow payment r_i and costs v_i, so the return per dollar on asset i is r_i/v_i. It is assumed that the financial sector dislikes brown exposure. They choose a share $s_B \in [0,1]$ of their portfolio in brown claims to maximize return per dollar net of a convex penalty for brown exposure:

$$\max_{s_B} \frac{r_G}{v_G}(1-s_B) + \frac{r_B}{v_B}s_B - \frac{\eta}{2}\, s_B^2. \tag{6}$$

[4] The source of the return wedge does not affect the measurement of the efficiency costs in this model. Any deviation in required returns across capital types induces a misallocation that lowers output. It could arise from preferences, risk premia, regulatory frictions, or anything else. All that matters for efficiency is the presence of the wedge, not its origin. That said, we adopt a financial sector microfoundation based on preferences to provide a structural interpretation based on our reading of the factors underpinning growth in ESG, and to connect the model to observable data on asset prices and asset market shares.

Here, $\eta \geq 0$ captures the penalty for brown capital: a higher η means higher required compensation to hold brown assets. This could come from different sources, such as regulatory constraints, ESG mandates, or an asset's underlying risk. It is assumed that the penalty is convex to reflect the idea that the marginal disutility of holding brown capital rises with exposure to it.

The optimality condition from this problem shows that brown capital must offer a higher return per dollar than green, with the premium exactly equal to the marginal disutility of holding brown capital, ηs_B:

$$\frac{r_B}{v_B} - \frac{r_G}{v_B} = \eta s_B. \tag{7}$$

This return wedge summarizes the trade-off faced by the financial sector when allocating capital. As investors are forced to hold more brown capital, the required compensation per unit held goes up. This drives up the required return on brown capital, creating a wedge τ in observed costs of capital. In turn, these higher returns lower valuations, leading to a pricing gap between brown and green assets. To capture this link, the CEA imposes a reduced-form pricing relationship:

$$\log v_G - \log v_B = \kappa\tau. \tag{8}$$

This expression reflects standard asset pricing logic. When a higher return on brown capital is required, its valuation must fall. This sensitivity is parameterized by $\kappa > 0$, which maps the rental wedge τ into the green-brown valuation gap. κ exists only to ensure that an asset-pricing equilibrium exists that is consistent with a given τ. Because firms' choices and misallocation depend solely on τ, κ is not calibrated and it plays no role in the quantitative results. (Below, it is discussed how equation 8 allows one to go from financial data to real misallocation.)

Market clearing. Let $V_i = v_i K_i$, denoting dollar holdings in asset i, so that total wealth is $V = V_G + V_B$. The financial market clears when the dollar holdings equal the market value of the capital firms use:

$$V = V_G + V_B = v_G K_G + v_B K_B.$$

The level of wealth, V, is endogenous and plays no allocative role; only relative prices and returns matter.

Equilibrium. Taking the cost of capital r_i as given, firms choose a cost-minimizing mix of capital, according to equation 2, scaling up until the marginal product of aggregate capital equals the price of capital, as shown in equation 3. Investors take (r_i, v_i) as given and allocate their portfolio between green and brown assets to maximize return, net of a penalty for brown exposure, which induces a required return wedge of size ηs_B from equation 7 and a valuation wedge from equation 8. Prices and valuations adjust such that markets clear. When $\eta = 0$, all wedges vanish and the capital mix reflects only technological efficiency; with $\eta > 0$, brown capital must offer a higher return, trades at a discount, and is used less, which generates allocative inefficiency.

Model Parameter Calibration and Identification

This subsection describes model parameters' identification and calibration used to estimate output losses from ESG investments with an environmental focus.

Capital share and elasticity of substitution. Following Fernald (2014), the CEA sets the capital share $\alpha = 0.4$. Based on literature estimates, the elasticity of substitution σ is set to a range from 2 to 4.[5]

Green-brown return wedge. The return wedge is calibrated as $\tau \equiv \ln R_B/R_G$, using Gormsen, Huber, and Oh (2025); see figure 13-1 above. The authors estimate the perceived cost of capital for a large panel of publicly traded firms based on firms' weighted average cost of capital, as discussed on company earnings calls. This measure represents the firm's expected return on assets (outstanding debt and equity) in financial markets. In other words, a firm's perceived cost of capital is the rental rate of capital that it faces. Unlike the actual cost of capital measured from realized asset prices, the perceived cost of capital has a direct bearing on a firm's demand for green investments. A broader body of recent literature also estimates a positive return wedge between brown and green assets (i.e., brown investments have a higher expected return relative to green investments), based on the actual cost of capital.[6]

Green share. The CEA uses the green share of market capitalization as an input in measuring the undistorted share of green capital in production, θ. Although financial values V_i and physical quantities K_i generally differ, the CEA's model implies that when $\tau = 0$, $v_B = v_G$. Under these conditions, the undistorted green share of the real economy can be retrieved directly from financial shares:

$$\frac{V_G}{V_G + V_B} = \frac{vK_G}{v(K_G + K_B)} = \frac{K_G}{K_G + K_B} = \theta. \quad (9)$$

[5] Gormsen, Huber, and Oh (2025) use $\sigma = 3$ in their quantitative analysis. Papageorgiou, Saam, and Schulte (2017) find $\sigma = 2$, while Stockl and Zerrahn (2023) estimate $\sigma = 4$.

[6] Recent literature also finds that brown returns are higher than green returns. See, e.g., Hsu, Li, and Tsou 2023; Lioui and Misra 2023; Crosignani, Osambela, and Pritsker 2024; Giglio et al. 2025; Bolton and Kacperczyk 2021; Pástor, Stambaugh, and Taylor 2022; Lindsey, Pruitt, and Schiller 2021; Chava 2014; Faccini, Matin, and Skiadopoulos 2023; Eskildsen et al. 2024; Baker, Egan, and Sarkar 2024; Cheng et al. 2024; and Berk and van Binsbergen 2025.

Therefore, θ is normalized using a period with a negligible wedge. Figure 13-1 above shows that from 2009 to 2015, the wedge was close to zero and the green share of the market cap was constant, consistent with LSEG (2025) and Pástor, Stambaugh, and Taylor (2025). This period is used to calculate an average $\theta \approx 0.06$. In this step, equation 8 is relied on to assume that κ is stable over time. This allows one to interpret the constancy of green-brown valuation ratios during the period 2009–15 as evidence that the underlying rental wedge τ was essentially zero in that period. Subsequent movements in valuation ratios are then read as changes in τ rather than changes in κ, which provides the identifying link between financial valuations and the real-side wedge used in the misallocation calculations.

Model Results: Output Losses

Using the pinned-down structural parameters and the time series for green-brown wedges, the CEA estimates the misallocation-driven output loss using equation 5. Since losses scale with τ^2, the GDP loss implied by the range of substitutability σ values grow nonlinearly as the wedge widens. Cumulatively, from 2016 to 2023, the loss sums to $146 billion, which is about 0.5 percent of U.S. GDP in 2024. Based on the range of substitutability $\sigma \in [2,4]$, the implied range of output costs is between $98 billion and $196 billion. Figure 13-2 above reports the implied GDP loss in percentages and in 2024 dollars.