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Taste-based Investing, Government Policies and Competition in Financial Intermediation

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ABSTRACT: This paper develops a theory of how investors' tastes are transmitted to aggregate investment through the market structure of financial intermediation. Whether tastes affect equilibrium capital allocation depends on where they originate—from households or from intermediaries—and on the degree of competition and segmentation in funding markets. Strong competition amplifies the pass-through of households' tastes for amenity assets, but arbitrages away intermediaries' own tastes. The same forces shape the effectiveness of financial-sector policies targeting households or intermediaries. I apply and quantify the framework in the context of green finance.

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WORKING PAPERS

Taste-based Investing, Government Policies and Competition in Financial Intermediation

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1 Introduction

Households and financial intermediaries care not only about the risk and return of their invested portfolios, but also about non-pecuniary considerations directly related to the activities that they finance. This may be for ethical, environmental, social, political or geopolitical reasons. A prominent example is green investment. If households or financial intermediaries value the environmental impact of their investments, they may demand a greater quantity of green assets (Barber, Morse, and Yasuda 2021; Bonnefon et al. 2020; Bauer, Ruof, and Smeets 2021; Kraussl, Oladiran, and Stefanova 2024). In a context of low carbon pricing, an optimistic view in green finance is that preferences alone could spontaneously direct funds away from dirty technologies, those that generate a lot of emissions, in favor of green technologies.

Whether these tastes significantly shift capital allocation, however, depends on how they interact with the structure of financial intermediation, and the profit-driven competitive forces in the markets for funds. In highly competitive financial systems, intermediaries with tastes for some investments may be forced to hold return-maximizing portfolios in order to retain funding, causing their tastes to be arbitraged away despite strong stated preferences. If tastes are to operate as complements to policies — for example if green finance is to complement politically-constrained carbon pricing—it is crucial to understand when such motives of intermediaries and households transmit into significant investments or when they are arbitraged away in funding markets.

This paper develops a theory of the transmission of investing tastes and financial-sector policies to real investment through the market structure of financial intermediation. The key insight is that the transmission of tastes depends critically on where they originate—from ultimate investors or from financial intermediaries—and on the market structure of financial intermediation, *i.e.* the degree of competition among intermediaries. Market structure determines whether and which tastes are passed through or arbitraged away. The same forces also shape the effectiveness of government interventions: policies that target intermediaries—such as lighter capital requirements for financial intermediaries when they invest in amenity assets—or households—tax rebates to households based on the share of amenity assets in intermediaries' portfolios—likewise perform differently across competitive environments and degrees of market segmentation.

I introduce a tractable model with tastes for amenity assets and imperfectly competitive financial intermediaries. In the model, final production relies on two capital inputs that are imperfect substitutes. One input generates a negative externality and is therefore overused in the absence of corrective policy. Firms fund investment in each input by issuing financial assets purchased by financial intermediaries. In turn, intermediaries compete imperfectly for household savings in the market for funds. Both households—the ultimate investors—and intermediaries may derive utility directly from holding assets that finance a particular type of activity. Assets that deliver such non-pecuniary benefits are referred to as *amenity* assets. For example, in climate finance, amenity assets correspond to green investments. Finally, returns are determined in the equilibrium of asset markets.

In this environment, efficient capital allocation requires a wedge between the after-tax required rate of return on normal and amenity assets to account for the negative externality of normal capital. In the absence of Pigouvian taxation, this wedge can come from an *amenity premium*—a difference between the pre-tax required rate of returns on normal and amenity assets—which plays the same allocative role as a corrective tax by discouraging investment in the externality-generating technology. However, sustaining such a premium in equilibrium is not guaranteed. Even if some investors or intermediaries have tastes for amenity capital, competitive forces may arbitrage the amenity premium away.

In the decentralized equilibrium, the pass-through of tastes for amenity assets to amenity investment depends on the degree of competition between financial intermediaries. The pass-through of households' taste for amenity assets is stronger when competition among intermediaries is strong—which is shaped by the households' elasticity of substitution across intermediaries and the inverse of the intermediary's equilibrium market share—as competitive pressure forces intermediaries to cater to investor preferences. By contrast, an increase in intermediaries' own taste for amenity assets is effective only when competition is limited: intense competition constrains intermediaries' ability to deviate from return-maximizing portfolios. As a result, competition and households' motives are complements, while competition and intermediaries' motives are substitutes.

When the tastes for amenity assets are heterogeneous, the endogenous sorting of households into intermediaries increases market power which affects the pass-through of preferences. Segmenting equilibria emerge with positive assortative matching as intermediaries specialize in buying more or less amenity assets, and households sort across them based on their preferences. In general, this endogenous segmentation increases market power. While this dampens the aggregate pass-through of households' tastes, it also boosts the pass-through of the intermediaries' preferences.

In general equilibrium, changes in the preferences of some households or some intermediaries also triggers reallocation of funds across intermediaries, which may amplify or mitigate the partial equilibrium pass-through of preferences. For example, it has been argued that central banks and sovereign wealth funds should rebalance their portfolios towards greener assets. But such a rebalancing of portfolios, which would raise returns on dirty assets, could be partially, if not fully, undone by other investors selling green assets and buying brown assets. Theoretically, the strength of these offsetting effects depends on the distribution of tastes for amenity assets among households and financial intermediaries but also on the degree of competition across intermediaries. In the special case in which households have no taste for amenity assets, the increase in the taste for amenity assets of an intermediary—and by extension, a subset of intermediaries—is offset by the migration of households towards intermediaries that invest less in amenity assets.

Importantly, the effectiveness of regulatory and fiscal instruments mirrors the logic highlighted for private tastes in the laissez-faire economy. Policies that operate through households—such as tax incentives based on the portfolio composition of their intermediary—are most effective at tilting aggregate investment towards amenity assets with competitive financial intermediaries. Policies that operate through intermediaries—such as portfolio-based capital requirements—are more effective when intermediaries enjoy some market power.

Finally, I propose two applications of these insights to green finance. First I assess the scope for taste-based investing to complement carbon policy across countries. To do this, I map out countries by the degree of concentration of their banking system and the households' preferences for green investment. The model suggests that countries with strong households' tastes for the environment and low concentration of their banking sector, such as the U.S. or Japan, are the most promising in terms of relying on tastes to tilt investments towards greener assets. By contrast, countries with weak households' tastes for the environment and low concentration, such as Russia or Argentina, are the least promising. European countries, which tend to have more concentrated banking systems, are in the middle.

In the second application, I calibrate the model and draw policy possibility frontiers—the combinations of financial policies targeting households and intermediaries that replicate the efficient allocation—for varying degrees of competition. In the calibrated model, the amenity premium required to implement the same allocation of a \$100 carbon price is around 10%, which is substantially larger than what is observed empirically. The optimal mix of policy instruments depends on market structure. When competition is strong—for example in the U.S.—implementing the efficient allocation would require a marginal tax rate of 50% on intermediaries' profits associated with their dirty investments but only 9% on households' capital income. Conversely, in markets that are less competitive, like in some European countries, the required marginal tax rate on intermediaries' profits should be only 8% but would need to be as high as 85% on households capital income.

More broadly, the paper provides a framework to analyze how tastes and policies interact with market structure in financial intermediation. The results apply beyond climate finance, including to ethical investing, industrial policy, and the allocation of capital toward socially or politically targeted activities.

Literature. A growing finance literature studies how investors' tastes and corporate social responsibility affect asset prices and portfolio choice. Early contributions include Heinkel, Kraus, and Zechner (2001), who show that exclusionary screening by socially responsible investors can affect equilibrium asset prices and firms' cost of capital. More recently, Pástor, Stambaugh, and Taylor (2021) develop an equilibrium asset-pricing model in which investors value sustainability directly, generating lower expected returns for sustainable assets. Pedersen, Fitzgibbons, and Pomorski (2021) characterize the trade-off between financial performance and ESG preferences in portfolio choice. Hart and Zingales (2022) argue that firms should maximize shareholders' welfare, beyond firm's value. A related strand emphasizes delegation and the role of financial intermediaries (Friedman and Heinle 2021; Avramov, Cheng, and Tarelli 2026). This paper's contribution is to show how competition and segmentation in financial intermediation shape the transmission of households' and intermediaries' tastes, and policy interventions into equilibrium portfolios and asset returns.

Similarly, the paper contributes to a macroeconomic literature on how the tastes of consumers and managers shape the allocation of resources across firms. In his seminal book, Becker (1957) argues that tastes-based discrimination by employers can persist under limited competition in the labor and goods markets and should disappear as competition intensifies. Bénabou and Tirole (2010) discuss the drivers and limits of socially responsible behaviors of firms as a means to further societal goals. Like in the current paper, there are several drivers of pro-social behaviors including delegated actions on behalf of stakeholders and manager-initiated corporate philanthropy. In a more recent paper, Aghion et al. (2023) show that firms in more competitive markets innovate more quickly towards amenity investment. While these papers look at the transmission of the managers' and consumers' preferences, we look at the transmission of investors' preferences and green financial-sector policies, and we highlight the role of competition among financial intermediaries.

The paper relates to the empirical literature on green finance. Several papers have quantified the size of the amenity premium and have usually found it to be small (Larcker and Watts 2020; Pietsch and Salakhova 2022; Panizza et al. 2025). Hong and Kacperczyk (2009) find evidence of distaste for "sin" stocks (companies involved in producing alcohol, tobacco, and gaming). In the green finance space, Li et al. (2025) estimate an asset-demand system to quantify the institutional price pressure induced by demand for green stocks. Barber, Morse, and Yasuda (2021), Bonnefon et al. (2020), Bauer, Ruof, and Smeets (2021), and Kraussl, Oladiran, and Stefanova (2024) find a strong taste of households and intermediaries for greenness and corporate externalities. This paper offers a tractable framework to understand the forces sustaining the greenium in general equilibrium. It highlights conditions under which tastes of ultimate investors and intermediaries, and financial-sector policies, are effective.

A large literature analyzes how imperfect competition and segmentation among financial intermediaries shape equilibrium asset prices, portfolio allocations, and the pass-through of shocks. In banking, some papers emphasize how market power affects pricing, risk-taking, and bank failure (Matutes and Vives 2000; Martínez-Miera and Repullo 2010). One important insight is that imperfect competition can be welfare-enhancing. In the current paper, limited competition can help transmit intermediaries' tastes. We build on recent work with limited substitutability and inelastic investor demand can generate deviations from competitive benchmarks (Koijen and Yogo 2019; Gabaix and Koijen 2021). Gil-Bazo and Ruiz-Verdu (2008), García and Vanden (2009) and Loseto and Mainardi (2023) build equilibrium models of financial intermediation and show that the degree of competition is central for pricing and the transmission of information. This paper contributes to this literature by showing that imperfect competition and segmentation is also key for the transmission of tastes. Market structure determines whether such motives and financial-sector policies are transmitted or arbitraged away in equilibrium, thereby shaping real investment allocation.

The remainder of the paper is organized as follows. Section 2 introduces a model of investing tastes and financial intermediation. Section 3 characterizes the efficient allocation and the laissez-faire equilibrium. Section 4 extends the results to a setting where households or intermediaries have heterogeneous tastes for amenity assets. Section 5 discusses policy interventions, calibrates the model in the case of green finance and draws policy possibility frontiers. Section 6 concludes.

2 A Model of Investing Tastes and Financial Intermediation

The economy is populated by final-good producers who use two imperfectly substitutable capital inputs. Each capital input requires an investment financed through the issuance of financial claims with possibly different returns, which are purchased by financial intermediaries. Both households and intermediaries may value the composition of investment for non-pecuniary reasons. Throughout the paper, I refer to assets that deliver such non-pecuniary benefits as *amenity* (A) assets, and to other assets as *normal* (N) assets. For example, in the climate-finance application later in the paper, amenity assets correspond to green assets and normal assets correspond to brown assets. Financial intermediaries compete for households funds. I abstract from government policies for now and introduce them in Section 5.

2.1 Final-good producers

There is a continuum of identical final-good producers of mass 1, indexed by $f \in [0, 1]$. Final goods are produced using a composite of two imperfectly substitutable capital inputs: an amenity capital input k_A and a normal capital input k_N. I abstract from labor for simplicity. The production function is

$$y = zk^{\kappa}, \tag{1}$$

$$k = \left[\theta_A k_A^{1-\frac{1}{\eta}} + \theta_N k_N^{1-\frac{1}{\eta}}\right]^{\frac{\eta}{\eta-1}}, \tag{2}$$

where η is the elasticity of substitution between the two technologies and z denotes aggregate total factor productivity.

The normal technology generates a negative externality on aggregate total factor productivity, $z(K_N), z' < 0$ where K_N denotes the aggregate level of normal capital.

This negative externality captures for example global warming in the case of greenhouse gas emissions or geopolitical pressures in the case of strategic inputs.

Firms rent capital from intermediaries at rental rates r_A for amenity capital and r_N for normal capital. Both types of capital depreciate at rate δ during production. Normalizing the price of the final good to one, and taking factor prices as given, a final-good producer solves:

$$c_f = \max_{k_A, k_N, \ell} \quad y - r_N k_N - r_A k_A \quad \text{subject to (1) and (2).} \tag{3}$$

2.2 Households

There is a continuum of households indexed by $i \in [0, 1]$. They live for one period. At the beginning of the period, each is endowed with some savings, s_i, and they choose in which financial intermediaries to invest them. At the end of the period, they consume their income which is made of returns on their savings. There are J financial intermediaries and a household invests all its savings in a single intermediary. Importantly, households value not only the returns offered by each intermediary, r_j, but also the share of its portfolio invested in amenity assets, a_j.

The valuation of the share of portfolio invested in amenity capital may reflect several motives. These include the externality implied by the use of normal technologies on households' welfare. For example, emissions caused by the use of dirty technologies has a negative external effect on households through global warming, climate disasters and pollution. But it also includes pure preferences for specific assets and is a reduced form for any convenience beyond the returns and risks trade-off.

Households draw a preference shock for each fund, ϵ_{ij}. This preference shock captures characteristics of an intermediary that a household values such as geographic location that are not directly related to returns and amenity. This modeling device leads to a smooth demand for each intermediary with a finite elasticity to returns as in Koijen and Yogo (2019) and Capelle and Pellegrino (2025).

Household i chooses consumption c_i and an intermediary j to maximize their utility:

$$u_i = \max_{c_i, j} \left\{ \ln c_i + \alpha \ln a_j + \epsilon_{ij} \right\} \tag{4}$$

$$\text{s.t.} \quad c_i = (1 + r_j) s_i \tag{5}$$

where α is the taste for amenity assets parameter of households. In the first part of the analysis, I assume it is constant across households. I then allow for heterogeneity in the following section.

2.3 Financial intermediaries

J intermediaries choose the portfolio share invested in amenity assets, a_j, and the returns they offer to their clients, r_j. These J intermediaries are in imperfect competition for deposits. Denote by $S = \int s_i di$ the total available savings of households and by π_j the share of all savings S received by intermediary j, *i.e.* its market share. To keep the focus on imperfect competition on the liability side, I assume that financial intermediaries take returns as given for their asset side.

The intermediary is owned by its manager. Like households, these managers have a taste for amenity assets, which is parametrized by χ. This taste is common across intermediaries in the first part of the analysis but allowed to be heterogeneous in Section 4. Given the rate of returns for amenity and normal assets r_A, r_N, and the rate offered by intermediary j to households r_j, the objective of a financial intermediary is to maximize a weighted sum of consumption from its profits and the share of its portfolio invested in amenity assets:

$$\max_{c_j, r_j, a_j} \left\{(1-\chi)\ln c_j + \chi \ln a_j\right\} \tag{6}$$

$$\text{s.t.} \quad c_j = [(r_A - r_j)a_j + (r_N - r_j)(1-a_j) - \delta] \times \pi_j \times S \tag{7}$$

where δ denotes the common rate of depreciation of capital. Importantly, market power and imperfect competition means that intermediaries take into account how their interest rate r_j affects the amount of deposits they collect $\pi_j S$.

This problem encapsulates the pure profit maximization in the limit where the taste for amenity assets is zero, $\chi \to 0$. On the contrary, when the taste for amenity assets becomes infinitely strong relative to the taste for profits, $\chi \to 1$, the intermediary always set profits to zero, irrespective of the degree of competition.

2.4 Market clearing

Denote by K_N, K_A the aggregate normal and amenity capital goods and by Y the aggregate output of final goods. The amenity and normal capital and final goods markets as well as the final goods' market clear:

$$K_A = \int a_j \pi_j S dj \tag{8}$$

$$K_N = \int (1 - a_j) \pi_j S dj \tag{9}$$

$$Y + (1 - \delta) S = \int_0^1 c_i di + \sum_{j=1}^{J} c_j + \int c_f df. \tag{10}$$

2.5 Equilibrium

An equilibrium is a set of rates of returns on amenity and normal capital, (r_N, r_A); intermediaries' consumption, interest rate and portfolio share in amenity assets $\{c_j, r_j, a_j\}_j$; a demand for the deposits of each intermediary π_j; households' consumption and choice of intermediaries $\{c_i, j_i\}$; firms' demand for amenity and normal capital (k_A, k_N) such that given required returns on capital, firms maximize profits; given the set of intermediaries' interest rates and amenity shares, households maximize utility; given other intermediaries' decisions, intermediaries choose their portfolio share in amenity assets and interest rate to maximize their utility internalizing their effect on the demand for their deposits; and markets clear.

2.6 Efficient allocation

I define a benchmark allocation to assess to what extent investing tastes—and in later sections, government policies—can move the economy toward efficiency. I define the efficient allocation as the allocation with maximum output:[1]

$$\max_{K_A, K_N} z(K_N) \left[\theta_A K_A^{1-\frac{1}{\eta}} + \theta_N K_N^{1-\frac{1}{\eta}} \right]^{\frac{\eta\kappa}{\eta-1}} \quad \text{subject to} \quad K_N + K_A = S. \tag{11}$$

3 Efficient Allocation and the Laissez-Faire Equilibrium

The analysis starts with a laissez–faire environment without government interventions. I analyze how the equilibrium allocation and returns are shaped by the nature of competition and tastes of households and financial intermediaries. I assess how the

[1] Defining a social optimum from the maximization of a social welfare function would require aggregating preferences of heterogeneous agents. To avoid having to assume weights and to deal with distributional issues, I focus on an output-maximizing benchmark.

transmission of these tastes to capital allocation depends on the degree of competition among intermediaries and how they move the economy toward efficiency. In Section 5, I introduce government policies.

3.1 Efficient allocation

In a social optimum, the marginal gains of allocating savings to normal capital, K_N, must be exactly equal to its social marginal costs, which include the opportunity cost of investing it in amenity assets and the externality, $z' < 0$. The stronger the externality—the more negative z'—the more the planner would like to rely on amenity capital and move away from normal capital. The first-order condition for social optimality is given by

$$\frac{\theta_A}{\theta_N}\left(\frac{K_N^*}{K_A^*}\right)^{\frac{1}{\eta}} = 1 + \Omega(K_N^*)\frac{z'(K_N^*)}{z} \tag{12}$$

where $\Omega(K_N^*) = \left[\theta_A\,(S - K_N^*)^{1-\frac{1}{\eta}} + \theta_N(K_N^*)^{1-\frac{1}{\eta}}\right]^{\frac{\eta}{\eta-1}} \frac{(K_N^*)^{\frac{1}{\eta}}}{\kappa\theta_N} > 0$ and $z' < 0$ captures the negative externality.

In a decentralized equilibrium without policies, private firms ignore the externality of normal capital, z'. The crucial question is: under what conditions can the tastes of households and intermediaries lead a decentralized allocation of funds replicate that social optimum by internalizing the negative externality? And how does it depend on the nature of competition among financial intermediaries?

3.2 Optimal behaviors of final good producers

To answer these questions, let's now look at the laissez-faire equilibrium, starting with the optimal condition of final-good producers. Their demand for each technology is inversely proportional to their cost and proportional to their relative productivities:

$$\frac{\theta_A}{\theta_N}\left(\frac{k_N}{k_A}\right)^{1/\eta} = \frac{r_A}{r_N} \tag{13}$$

Comparing this private optimality condition of firms with the social optimality condition (12), it is clear that a necessary and sufficient condition for the decentralized equilibrium to be optimal is that there is an "amenity premium" in equilibrium, *i.e.* the required rate of returns on amenity assets should be lower that the one on normal assets, $\frac{r_A}{r_N} = 1 + \Omega z'/z < 1$. This amenity premium would give the right incentives to firms to shift their allocation of inputs away from normal capital and toward amenity capital.

A Pigouvian tax on normal capital $r_N(1+\tau^C)$ would implement the first best by re-aligning private incentives of firms with social valuations, even if required rates of returns were equalized across both types of assets $r_N = r_A$. This tax should be such that the ratio of private rates of returns should equalize the ratio of social rates of returns, $\frac{1}{1+\tau^C} = 1 + \Omega z'/z < 1$. I come back to Pigouvian taxation when I introduce government policies in Section 5.

In the laissez-faire, the key question is how to generate and sustain an amenity premium in equilibrium, $r_A < r_N$: how could a financial system with profit-maximizing intermediaries in competition and final investors seeking to maximize their portfolio income be willing to invest in lower-return assets? I next turn to the households and intermediaries' problems to see how their tastes for amenity assets could implement such a premium, and how it depends on the market structure of financial intermediation.

3.3 Households optimality conditions

Households choose which intermediary they lend their savings to. When the households' preference shocks are i.i.d across households, and distributed Extreme Value Type I with dispersion parameter $1/\sigma$, the share of households and savings going to intermediary j is given by

$$\pi_j = \frac{\left[(1+r_j)a_j^{\alpha}\right]^{\sigma}}{\sum_k \left[(1+r_k)a_k^{\alpha}\right]^{\sigma}}. \tag{14}$$

The share of households lending their savings to intermediary j is increasing in the portfolio gross returns offered by this intermediary, $1+r_j$, with elasticity σ and in the share of its portfolio invested in amenity assets, a_j, with elasticity $\sigma\alpha$. The stronger the preference for amenity assets of households, α, the more elastic the share of households is to the share of the intermediaries' portfolio invested in these assets. This will be important for what follows.

3.4 Intermediaries' mark-downs and portfolio share in amenity assets

Intermediaries make two important decisions. They choose the interest rate r_j they offer to households internalizing the effect this decision has on the amount of funds they can collect. They also choose the allocation of their portfolio a_j between normal and amenity assets. One can reformulate the problem of an intermediary j as a choice of (r_j, a_j) to solve

$$\max_{r_j,a_j}(1-\chi)\ln\left(\left[(r_A-r_j)a_j+(r_N-r_j)(1-a_j)-\delta\right]\pi_j\right)+\chi\ln a_j \quad \text{s.t.} \quad (14). \tag{15}$$

The first-order conditions give the optimal interest rate r_j and the optimal share of portfolio invested in amenity assets a_j.

Lemma 1. *The optimal interest rate is given by*

$$1+r_j=(1+r_N-\delta)\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)} \tag{16}$$

where $\tilde{\sigma}_j=\sigma(1-\pi_j)$*. The optimal portfolio share in amenity assets is given by:*

$$a_j=\frac{1+r_N-\delta}{r_N-r_A}\left[\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)}\alpha+\frac{\chi}{1+(1-\chi)\tilde{\sigma}_j}\right]. \tag{17}$$

The first equation (16) gives the optimal mark-down. It contains the usual terms: it is decreasing in the elasticity of substitution σ but increasing in the market share, $(1-\pi_j)$. In addition, the mark-down is decreasing in χ. This is intuitive: when intermediaries have a preference for amenity assets, they are ready to sacrifice returns to clients and therefore have fewer clients.

The second equation (17) reflects the optimal balance of objectives between investing in amenity assets a_j and maximizing profits. To better understand this expression, it is useful to draw a parallel between the intermediaries' problem and the traditional problem of a consumer allocating their income across several goods. The term $1+r_N-\delta$ plays the role of income. It can be "spent" on three "goods": amenity investment a_j—with price r_N-r_A—, on interest rate r_j to households, or it can be retained and consumed c_j. Table 1 shows the optimal allocation of the income $1+r_N-\delta$ across these three goods in several special cases.

In the same way that an increase in the consumers' income leads to an increase in the consumption of a (normal) good, here the increase in the rate of returns on normal capital $1 + r_N - \delta$ leads to an increase in the investment in amenity assets a_j. In addition, the optimal share a_j depends negatively on the amenity premium $(r_N - r_A)$. This is because this amenity premium is the opportunity cost of buying amenity assets.

Spending on ...	Amenity $\frac{(r_N - r_A)a_j}{1+r_N-\delta}$	Returns to clients $\frac{1+r_j}{1+r_N-\delta}$	Net margins $\frac{(r_A-r_j)a_j+(r_N-r_j)(1-a_j)}{1+r_N-\delta}$
Perfect competition $\tilde{\sigma} \to +\infty$	α	$1-\alpha$	0
No intermediary taste $\chi = 0$, and $\tilde{\sigma} < +\infty$	$\frac{\tilde{\sigma}}{1+\tilde{\sigma}}\alpha$	$\frac{\tilde{\sigma}}{1+\tilde{\sigma}}(1-\alpha)$	$\frac{1}{1+\tilde{\sigma}}$
No competition $\tilde{\sigma} = 0$	χ	0	$1-\chi$
No household taste $\alpha = 0$ and $\tilde{\sigma} < +\infty$	$\frac{\chi}{1+(1-\chi)\tilde{\sigma}}$	$\frac{(1-\chi)\tilde{\sigma}}{1+(1-\chi)\tilde{\sigma}}$	$\frac{1-\chi}{1+(1-\chi)\tilde{\sigma}}$

Table 1: Optimal allocation of intermediaries' income in special cases

The optimal share of income $(1 + r_N - \delta)$ spent on amenity assets $a_j \times (r_N - r_A)$ is given by the term in brackets $\left[\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)}\alpha + \frac{\chi}{1+(1-\chi)\tilde{\sigma}_j}\right]$. It has two components. The first one on the left $\left(\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)}\alpha\right)$ corresponds to the taste of households for amenity assets, α, multiplied by the elasticity of households' choices to the share of amenity assets, $\tilde{\sigma}_j$. It depends on α because intermediaries understand that they can capture more deposits by investing more in amenity assets, when households have tastes for these assets (recall that the elasticity of π_j to a_j is $\sigma\alpha$). But intermediaries also understand that they have market power so they can increase their profits by lowering their amenity assets and not lose all their clients. Like the mark-down on interest rates, intermediaries with market power transmit households' preferences less than one for one. When intermediaries have no preference for amenity assets themselves, $\chi = 0$, they thus under-invest in amenity assets, relative to what households would like.

The second term inside the bracket $\left(\frac{\chi}{1+(1-\chi)\tilde{\sigma}_j}\right)$ corresponds to the financial intermediaries' taste for amenity assets, χ. Contrary to the first term in brackets, it is decreasing in the degree of competition, $\tilde{\sigma}_j$. This is because when competition is strong, an intermediary can't depart from the market competitive portfolio without losing many clients. The next paragraph derives a more general result on the conditions of implementability of an amenity premium.

3.5 Conditions for an amenity premium

In the decentralized equilibrium of this economy, all intermediaries are ex post identical. They have the same portfolios $a_j = a$, the same interest rate $r_j = r$ and the same size $\pi_j = \pi$, which implies $\tilde{\sigma}_j = \tilde{\sigma}$. For this reason, I drop the j subscript in the remainder of this section.

I am now ready to derive necessary and sufficient conditions—on the tastes for amenity assets and the degree of competition across financial intermediaries—for the decentralized equilibrium to feature an amenity premium and therefore stronger investment in amenity assets. The following lemma shows that to sustain an amenity premium, it must be that either financial intermediaries have a taste for amenity assets and competition is imperfect $\tilde{\sigma} < +\infty$, or households have a taste for amenity assets and there are some competitive pressures, $\tilde{\sigma} > 0$.

Lemma 2 (Conditions for an amenity premium)**.** *An amenity premium arises in equilibrium if and only if $\alpha > 0$ and $\tilde{\sigma} > 0$, or $\chi > 0$ and $\tilde{\sigma} < +\infty$.*

The intuition of this lemma is direct when one looks at equation (17). This is a rather unsurprising result that a necessary condition is that some agents, either households or intermediaries, have tastes for amenity assets. If no agents had a taste for amenity assets, returns on normal and amenity assets should be equalized $r_N = r_A$, no amenity premium could be sustained in equilibrium and there would be under-investment in amenity capital relative to the efficient benchmark.

But this necessary condition is not even sufficient: it must also be that the type of agents that have tastes for amenity assets evolve in the appropriate competitive environment. If only intermediaries care for amenity assets but households are infinitely elastic to returns, no amenity premium could emerge in equilibrium. This is an insightful result: intermediaries with a taste for amenity assets cannot move the economy towards the efficient allocation unless they operate with some market power, *i.e.* in a non-competitive environment. The opposite is also true: households with a taste for amenity assets cannot move the economy towards the efficient allocation unless intermediaries are subject to some competitive pressures.

3.6 Pass-through of an increase in households' taste for amenity assets

I next derive expressions for the pass-through of each preference parameter. I first look at an increase in the taste for amenity assets of all households, α, in partial equilibrium, *i.e.* holding the required rates of returns r_N, r_A fixed. I show how the transmission of each preference parameter depends on the competitive environment $\tilde{\sigma}$ and derive their implications for mark-downs and the interest rate on savings, r.

Proposition 1. *Assume that r_N and r_A are fixed. The partial equilibrium change in the portfolio share in amenity assets,*

$$\frac{\partial a}{\partial \alpha} = \frac{(1 + r_N - \delta)(1 - \chi)\tilde{\sigma}}{(r_N - r_A)(1 + (1 - \chi)\tilde{\sigma})}, \tag{18}$$

is increasing in the degree of competition $\tilde{\sigma}$ and decreasing in the taste of financial intermediaries for amenity assets, χ. Mark-down and intermediaries' profits remain unchanged.

The pass-through of the taste of households for amenity assets on the portfolio share in amenity assets is increasing in the degree of competition $\tilde{\sigma}$. In that sense, households' tastes and competition are complementary. This complementarity arises for two reasons which we have already encountered in the previous paragraph. A high elasticity σ means that an intermediary has an incentive to follow households' preferences to avoid losing funding. However this incentive is tempered by a high market share π. A high market share limits the sensitivity of intermediaries to households' tastes for amenity assets. Indeed, demand for deposits from households is imperfectly elastic to the share of amenity assets in portfolios and financial intermediaries understand that they can increase their profits by limiting their investment in amenity assets which are relatively more expensive without losing all their deposits.

In the extreme case where funds are infinitely elastic and intermediaries operate under a lot of competitive pressures $\tilde{\sigma} \to +\infty$, households' tastes are fully passed on the investment decisions of intermediaries, and the pass-through is given by $\frac{\partial a}{\partial \alpha} = \frac{1+r_N-\delta}{r_N-r_A}$.

The result that the pass-through is decreasing in the taste of intermediaries for amenity assets is perhaps counterintuitive. One might instead think that if intermediaries have a strong taste for amenity assets they would be ready to pass on any increase in their clients' taste for amenity assets. To understand this surprising result, recall that

$(1-\chi)$ is the preference of intermediaries for profits (as opposed to amenity assets). When intermediaries care less about profits (higher χ), they react less to changes in the preferences of households that may impact their profits. Conversely, when intermediaries value profits relatively more (low χ), they are very sensitive to changes in their clients' behavior to keep their funds or to leave, and therefore follow their clients' preferences much more closely.

Finally, the effects of the taste of intermediaries and the degree of competition amplify each other. The negative impact of the taste of intermediaries, χ, on the pass-through of households' tastes to the portfolio share in amenity assets $\left(\frac{\partial a}{\partial \alpha}\right)$ diminishes as the degree of competition, $\tilde{\sigma}$, goes up. In the limit where competition is perfect which corresponds to $\tilde{\sigma} \to +\infty$, the taste of intermediaries for amenity assets, χ, does not impact at all the response of the portfolio share to taste of households for amenity assets. Conversely, if financial intermediaries care a lot about amenity assets, $\chi = 1$, the degree of competition has no effect on the size of the pass-through of households' taste.

3.7 Pass-through of the intermediaries' taste for amenity assets

I next look at an increase in the taste for amenity assets of intermediaries, χ. The following lemma summarizes how the effects of increasing χ depends on the degree of competition $\tilde{\sigma}$ and on the taste parameter of households α.

Proposition 2. *Assume that r_N and r_A are fixed. The partial equilibrium change in the portfolio share in amenity assets is given by*

$$\frac{\partial a}{\partial \chi} = \frac{(1 + r_N - \delta)(1 + \tilde{\sigma}(1-\alpha))}{(r_N - r_A)(1 + \tilde{\sigma}(1-\chi))^2}. \tag{19}$$

When the taste of intermediaries for amenity assets isn't too high, $\chi < \frac{2+(\tilde{\sigma}-1)(1-\alpha)}{2+\tilde{\sigma}(1-\alpha)}$, the pass-through is decreasing in the degree of competition $\tilde{\sigma}$ and decreasing in the taste of households for amenity assets, α.

The pass-through of intermediaries' taste to portfolio shares is decreasing in the degree of competition as long as the taste parameter χ isn't too high. In that sense, intermediaries' tastes and competition are substitutable. This is the opposite result I obtained for the pass-through of the households' tastes parameter.[2]

[2] Note that the term $\frac{2+(\tilde{\sigma}-1)(1-\alpha)}{2+\tilde{\sigma}(1-\alpha)}$ is in general close to 1, therefore it would take a very strong taste

The intuition for the result that the pass-through is decreasing in the degree of competition is as follows. When intermediaries operate in a very competitive environment (high $\tilde{\sigma}$), they would lose a lot of clients if they were to invest more in amenity assets since this re-balancing of portfolios would decrease the interest rate intermediaries could offer. This result is very interesting: for intermediaries to pass-through their tastes, they need a strong degree of market power.

Surprisingly, the pass-through is lower when the taste of households for amenity assets is high. At first, one would rather expect that when households like amenity assets a lot, they are happy to see their intermediary increase its investment in amenity assets. But this reasoning ignores the fact that the intermediary already internalized this preference in its initial portfolio choice. To understand this result, recall that α is the elasticity of households to the amenity portfolio shares relative to returns. A high α means that households react strongly to changes in the share of portfolios invested in amenity assets. Intermediaries thus understand that changing this share would impact a lot their funding, and they are therefore reluctant to impose their taste too strongly to avoid losing funds.

3.8 General equilibrium: change in asset returns

In general equilibrium, the endogenous change in returns mitigates the partial equilibrium increase in the amenity share. This is because an increase in the share of portfolios invested in amenity assets leads to an increase in the amenity premium, $r_N - r_A$, which increases the opportunity cost of investing in these assets and disincentives intermediaries to hold them. The quantitative strength of this channel depends on the elasticity of substitution, η:

$$d \ln \left(\frac{r_A}{r_N} \right) = -\frac{1}{\eta} d \ln \left(\frac{K_A}{K_N} \right) = -\frac{1}{\eta} \frac{d \ln \bar{a}}{(1 - \bar{a})}. \tag{20}$$

3.9 Private Tastes Possibility Frontier

To summarize the previous results, it is useful to define the private tastes possibility frontier (PTPF), which is the equivalent of a policy possibility frontier when the levers are the tastes of private agents. The PTPF draws all the combinations of α and χ that

of intermediaries for amenity assets to reverse the condition. When the taste of intermediaries is above this threshold, an increase in competition can leads to an increase in the pass-through.

achieve a given objective of portfolio shares, a^*:

$$\alpha(\chi) = a^* \frac{r_N - r_A}{1 + r_N - \delta} \left(\frac{1}{\tilde{\sigma}(1-\chi)} + 1 \right) - \frac{\chi}{\tilde{\sigma}(1-\chi)} \tag{21}$$

The previous results highlight that the effectiveness of each lever depends on the degree of competition. To illustrate this important point, I draw several PTPFs corresponding to different degrees of competition $\tilde{\sigma}$. In this example, the target portfolio share is set

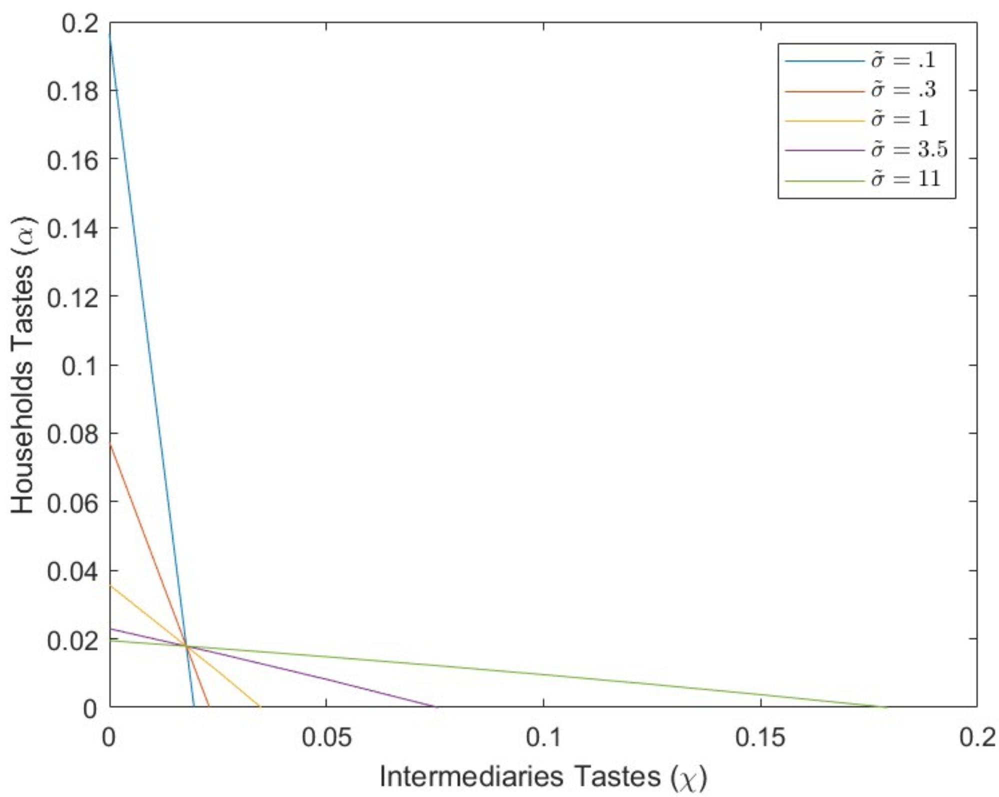

Figure 1: Private Tastes Possibility Frontier

Note: Each line shows combinations of α and χ that yield the same amenity-asset share under different degrees of competition $\tilde{\sigma}$.

to $a^* = .5$, and the rate of returns on normal and amenity investment to $r_N = 7\%$ and $r_A = 3\%$, respectively. The rate of depreciation δ is set to 5%.[3]

[3] In general equilibrium, returns r_N, r_A are related to the portfolio share a^* for a given level of aggregate savings S. From a calibration perspective, it is always possible to back out the technological parameters (θ_A, θ_N), the total level of savings S, and the level of total factor productivity z so that the

Figure 1 shows the results. When competition is high (blue line, high $\tilde{\sigma}$) households' tastes are a more effective lever to increase investments in amenity assets than intermediaries' preferences. On the contrary when competition is low (green line, low σ), intermediaries' tastes transmit more effectively.

One could also ask the question from the perspective of competition policies: is competition helpful or harmful for investments in amenity assets? The answer to this question depends crucially on the underlying tastes of households and intermediaries. Competition is good only when the key impulse comes from households. By contrast, when the impulse comes from financial intermediaries, competition can impede investments in amenity assets—for example in green assets in the case of green finance.

3.10 Application: Potential for taste-based green finance across countries

Applied to investment in green assets, the results derived above suggest that intermediaries' tastes in green assets would transmit more effectively in countries where competition across banks is not too strong. By contrast, households' tastes to invest in greener intermediaries would work better in countries with a higher degree of competition across intermediaries.

These insights motivate an empirical mapping exercise to assess where taste-based investing could meaningfully complement carbon pricing across countries. Specifically, I position each country along two key dimensions: the degree of competition faced by financial intermediaries ($\tilde{\sigma}$) and the strength of households' green preferences (α). The degree of competition is proxied using the sum of market shares of the top five banks in the World Development Indicators database.[4] I measure households' preference for green investment using the question on their willingness to pay higher prices for the environment in the latest International Social Survey Programme (ISSP). The question asked, "How willing would you be to pay much higher prices in order to protect the environment?", captures well the trade-off faced by households in the model between higher returns on portfolio and higher share of amenity assets, which translates in lower

objective for a^* and the calibrated rates of returns on each asset correspond to the efficient allocation with $a^*S = K_A^*$ and $(1-a^*)S = K_N^*$. This is exactly the spirit of the application to green finance in Section 5.

[4] To the best of my knowledge, there are no available estimates of country-specific elasticities of funds across financial intermediaries, σ. For this reason, this section assumes that the heterogeneity in this elasticity across countries is small relative to the degree of concentration.

emissions.[5]

Results are shown in Figure 2. From left to right, countries are ranked by the households' willingness to pay higher prices to offset environmental externalities. From bottom to top countries are ranked by the concentration of their financial intermediation sector. The figure identifies four regimes with different potential for taste-based green finance.

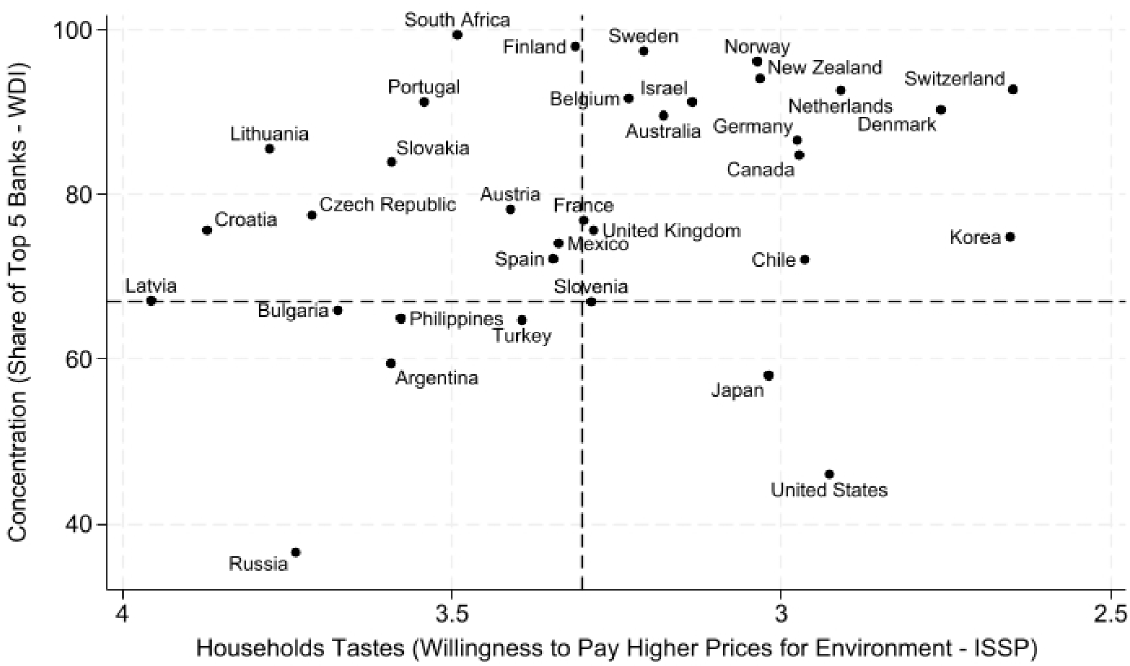

Figure 2: Scatter plot of bank concentration against households' tastes

Note: This scatter plot maps countries by their banking sector concentration measured by the share of total assets held by the five largest banks (from the World Development Indicators) and by the households' willingness to pay higher prices to protect the environment (from the ISSP survey data).

The countries in the bottom right quadrant offer the most promising environment for taste-based investing. Households have a strong willingness to pay for the environment and concentration is low, suggesting strong pass-through of these preferences. The United States and Japan are in this quadrant.

The second most promising quadrant is the top right, where households have a strong taste for the environment but the financial sector is quite concentrated, limiting the

[5]It is difficult to measure the intermediaries' preferences for amenity assets independently from those of households, for the reason highlighted in this paper. However, equation (17) could be used to back out the preferences of intermediaries, χ, if one observes households' preferences α, the degree of competition $\tilde{\sigma}$, the aggregate amenity share, $\bar{a}$, and rates of returns, r_N, r_A.

pass-through of these preferences. It is still promising in the sense that if financial intermediaries have strong preferences for the environment as well—which is not directly observable—their pass-through would be strong. Canada, Chile, South Korea and Western European countries are in this quadrant.

The third most promising quadrant is the top left where households have weak preferences for the environment and the financial sector is quite concentrated. There is only some hope in that intermediaries may still have strong taste for the environment, in contrast with households, which would be effectively passed through given the high level of concentration. Eastern and Southern European countries can be found in this quadrant.

Finally, the bottom left quadrant is the least hopeful for taste-based investing, since households have weak preferences for the environment and the financial system is not concentrated. Even if intermediaries had a taste for the environment, the pass-through of these preferences would be weak given the level of competition. Russia and Argentina are in this quadrant.

This mapping highlights where private tastes alone have the highest potential to reallocate capital toward green investments. Taste-based investing is likely to complement carbon pricing most effectively in countries combining strong household environmental preferences with competitive financial intermediation. More concentrated systems would need to rely on intermediaries themselves having strong green preferences.

4 Heterogeneous Households and Intermediaries

The previous section assumed all households and intermediaries have identical preferences. In this section I allow for heterogeneous tastes of households and intermediaries. In this environment, segmenting equilibria endogenously arise. I show how the sorting of households into intermediaries increases market power and thereby affects the pass-through of preferences.

4.1 Generalized model

Households are partitioned into a finite set of types indexed by $t \in \mathcal{T}$, each characterized by a taste parameter α_t and population share f_t, with $\sum_{t\in\mathcal{T}} f_t = 1$. Similarly, intermediaries are heterogeneous in their preference parameter, χ_j.

Optimality conditions. I first derive the analog of the optimal mark-down condition (16) and of the optimal portfolio share in amenity assets (17) when households and intermediaries are heterogeneous in their preferences. Let π_{jt} denote the share of type-t households investing in intermediary j, and let

$$\pi_j \equiv \sum_{t \in \mathcal{T}} f_t \pi_{jt}$$

denote the total market share of intermediary j. The composition of intermediary j's investor base is given by

$$\omega_{jt} \equiv \frac{f_t \pi_{jt}}{\pi_j},$$

which represents the share of type-t households among investors in intermediary j. The effective degree of market power faced by intermediary j is summarized by the inverse of $\sum_{t \in \mathcal{T}} \omega_{jt} (1 - \pi_{jt})$.

Lemma 3. *The optimal portfolio share invested in amenity assets by intermediary j is then given by*

$$a_j = \frac{1 + r_N - \delta}{r_N - r_A} \left[\frac{\sigma(1-\chi_j) \sum_{t \in \mathcal{T}} \omega_{jt} \alpha_t (1 - \pi_{jt})}{1 + \sigma(1-\chi_j) \sum_{t \in \mathcal{T}} \omega_{jt} (1 - \pi_{jt})} + \frac{\chi_j}{1 + \sigma(1-\chi_j) \sum_{t \in \mathcal{T}} \omega_{jt} (1 - \pi_{jt})} \right] \tag{22}$$

and the optimal interest rate is given by

$$1 + r_j = \frac{(1 + r_N - \delta) \sigma (1-\chi_j) \sum_{t \in \mathcal{T}} \omega_{jt} (1 - \pi_{jt})}{1 + \sigma(1-\chi_j) \sum_{t \in \mathcal{T}} \omega_{jt} (1 - \pi_{jt})} \tag{23}$$

Segmenting equilibria. Given households and intermediaries are now heterogeneous in their preference for amenity assets, segmenting equilibria emerge. In a segmenting equilibrium, intermediaries choose different portfolios and interest rates, inducing endogenous sorting of household types across intermediaries according to their preferences for amenity assets. In equilibrium, intermediaries with a higher preference for amenity assets invest in more amenity assets, offer a lower rate of return on deposits and attract relatively more households who value these assets more $\alpha_t > 0$. Conversely, intermediaries with a lower preference for amenity assets invest more in normal assets, but offer a higher rate of return on deposits.

To better understand this endogenous market segmentation, let's consider the simplest case with two types of households $\mathcal{T} = 2$, with $0 = \underline{\alpha} < \bar{\alpha}$ and two types of intermediaries for amenity assets with $0 = \underline{\chi} < \bar{\chi}$. It is natural to look at an equilibrium with two financial contracts with different portfolio shares in amenity assets and returns $(\underline{a}, r_{\underline{a}}), (\bar{a}, r_{\bar{a}})$ and positive assortative matching in the sense that intermediaries with strong preference for amenity assets offer the contract with a higher share invested in amenity assets and vice-versa. Denote by $J_{\bar{a}} < J$ the number of such intermediaries.[6] The interest rate and portfolio shares associated with both financial contracts are given by the optimality conditions of the banks (22) and (23). The share of households of each type in each bank type, $\pi_{\underline{a},\underline{\alpha}}, \pi_{\bar{a},\bar{\alpha}}$ are determined by the optimality condition of households:

$$\pi_{\underline{a},\underline{\alpha}} = \frac{\left[(1+r_{\underline{a}})\underline{a}^{\underline{\alpha}}\right]^{\sigma}}{(J - J_{\underline{a}})\left[(1+r_{\underline{a}})\underline{a}^{\underline{\alpha}}\right]^{\sigma} + J_{\underline{a}}\left[(1+r_{\bar{a}})\bar{a}^{\underline{\alpha}}\right]^{\sigma}} \tag{25}$$

$$\pi_{\bar{a},\bar{\alpha}} = \frac{\left[(1+r_{\bar{a}})\bar{a}^{\bar{\alpha}}\right]^{\sigma}}{(J - J_{\underline{a}})\left[(1+r_{\underline{a}})\underline{a}^{\bar{\alpha}}\right]^{\sigma} + J_{\bar{a}}\left[(1+r_{\bar{a}})\bar{a}^{\bar{\alpha}}\right]^{\sigma}}. \tag{26}$$

These six equations determine the six unknowns $\pi_{\underline{a},\underline{\alpha}}, \pi_{\bar{a},\bar{\alpha}}, \underline{a}, \bar{a}, \underline{r}, \bar{r}$. I then investigate the model's equilibria numerically.

Figure 3 shows how the segmenting equilibrium changes with the preference parameter $\bar{\chi}$. As the preference parameter $\bar{\chi}$ increases, intermediaries with strong preferences invest increasingly in amenity assets (top left panel) while intermediaries with no preference don't invest at all in amenity assets. As the preference parameter $\bar{\chi}$ increases, intermediaries with strong preferences offer a lower rate of return on deposits (bottom left), because their market power—the inverse of $\sum_{t\in\mathcal{T}} \omega_{jt}\,(1-\pi_{jt})$—increases (bottom right). This is driven by the fact that households with weak preferences for amenity assets increasingly invest in intermediaries with higher deposit rates (top right), which results in increased sorting and segmentation.

[6] Theoretically there could exist equilibria in which intermediaries with identical preferences offer different contracts (or even more surprising, equilibria with negative assortative matching). This would require these ex ante identical intermediaries to have different funding base and to be indifferent between both financial contracts. Formally, the indifference condition requires that if an intermediary makes lower profit per unit of deposits—typically because it invests a higher share in amenity assets—it must attract a larger base to reach the same level of profits:

$$\frac{f_{\bar{\alpha}}\pi_{\bar{a},\bar{\alpha}} + f_{\underline{\alpha}}(1-\pi_{\underline{a},\underline{\alpha}})}{1+\sigma(1-\chi)\frac{f_{\bar{\alpha}}\pi_{\bar{a},\bar{\alpha}}(1-\pi_{\bar{a},\bar{\alpha}})+f_{\underline{\alpha}}(1-\pi_{\underline{a},\underline{\alpha}})\pi_{\underline{a},\underline{\alpha}}}{f_{\bar{\alpha}}\pi_{\bar{a},\bar{\alpha}}+f_{\underline{\alpha}}(1-\pi_{\underline{a},\underline{\alpha}})}} = \frac{f_{\bar{\alpha}}(1-\pi_{\bar{a},\bar{\alpha}}) + f_{\underline{\alpha}}\pi_{\underline{a},\underline{\alpha}}}{1+\sigma(1-\chi)\frac{f_{\bar{\alpha}}\pi_{\bar{a},\bar{\alpha}}(1-\pi_{\bar{a},\bar{\alpha}})+f_{\underline{\alpha}}(1-\pi_{\underline{a},\underline{\alpha}})\pi_{\underline{a},\underline{\alpha}}}{f_{\bar{\alpha}}(1-\pi_{\bar{a},\bar{\alpha}})+f_{\underline{\alpha}}\pi_{\underline{a},\underline{\alpha}}}}. \tag{24}$$

It turns out that the only solution to this equation implies a symmetric equilibrium with $\pi_{\bar{a},\bar{\alpha}} = \pi_{\underline{a},\underline{\alpha}}$. This means that these equilibria don't exist.

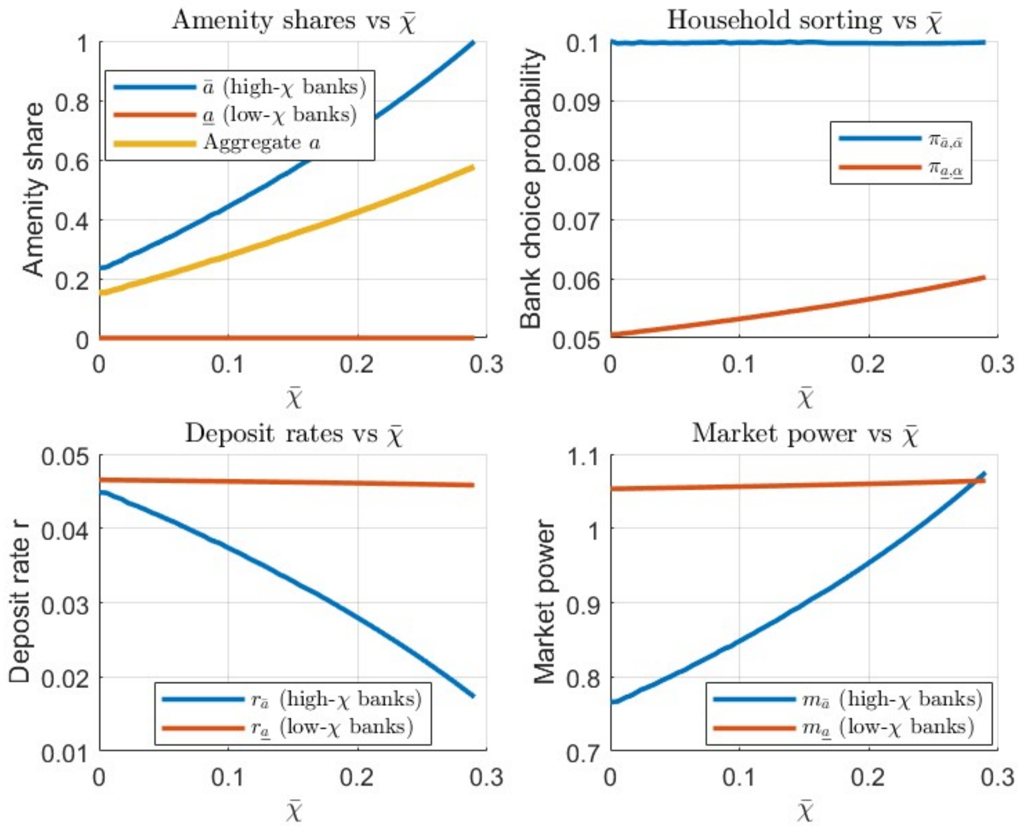

Figure 3: Segmenting equilibrium as a function of $\bar{\chi}$

Note: This figure shows how the segmenting equilibrium changes with the preference for amenity assets of high-χ intermediaries, $\bar{\chi}$. Top-left: portfolio share in amenity assets. Top-right: share of high-α (low-α) households investing in high-χ (low-χ) intermediaries. Bottom-left: deposit rate offered by intermediary, r. Bottom-right: measure of market power, $(\sum_t \omega_{jt}(1-\pi_{jt}))^{-1}$.

4.2 Pass-through of taste for amenity assets of households

Let's now go back to an arbitrary number of types of households and intermediaries. In this environment, I analyze the pass-through of the taste for amenity assets of households. The novel insight is that the transmission of the taste for amenity assets of households depends on the degree of market segmentation. When markets are segmented by households' and intermediaries' preference parameters, the taste for amenity assets of households transmits less effectively. This is because segmentation endogenously leads to an increase in the market power of intermediaries. A higher market power tends to lower the portfolio share in amenity assets as well as the pass-through. We show that the pass-through would be higher in a (counterfactual) pooling equilibrium in which households didn't sort across intermediaries.

Consider an increase in the preference parameter of all households types by the same absolute amount $d\alpha_t = d\alpha$ for all $t \in \mathcal{T}$.

Proposition 3. *Assume that r_N and r_A and $\{\pi_{jt}\}_{jt}$ are fixed. In partial equilibrium, the pass-through of a change in preferences $d\alpha$ on the portfolio share in amenity assets is given by*

$$da_j = \frac{1 + r_N - \delta}{r_N - r_A} \frac{\sigma(1-\chi) \sum_{t \in \mathcal{T}} \frac{f_t \pi_{jt}}{\pi_j}(1 - \pi_{jt})}{1 + \sigma(1-\chi) \sum_{t \in \mathcal{T}} \frac{f_t \pi_{jt}}{\pi_j}(1 - \pi_{jt})} d\alpha \tag{27}$$

Segmentation of households by their type has a first-order impact on the partial equilibrium pass-through of tastes because it alters the effective degree of market power enjoyed by intermediaries. The term $\sum_{t \in \mathcal{T}} \frac{f_t \pi_{jt}}{\pi_j}(1 - \pi_{jt})$, which captures the degree of market power, depends on the dispersion of households' types across banks. If households were evenly distributed across intermediaries—a counterfactual "pooling equilibrium"—this term would collapse to $1 - \pi_j$ and the partial equilibrium pass-through would be

$$da_j = \frac{1 + r_N - \delta}{r_N - r_A} \frac{\sigma(1-\chi) \left(1 - \sum_{t \in \mathcal{T}} f_t \pi_{jt}\right)}{1 + \sigma(1-\chi) \left(1 - \sum_{t \in \mathcal{T}} f_t \pi_{jt}\right)} d\alpha. \tag{28}$$

Using Jensen's inequality, one can see formally that the segmentation of households across intermediaries reduces the sensitivity of funding:

$$\frac{\sum_t f_t \pi_{jt}(1 - \pi_{jt})}{\sum_t f_t \pi_{jt}} \;\leq\; 1 - \sum_t f_t \pi_{jt}, \tag{29}$$

with equality if and only if π_{jt} is constant across household types, which is exactly what would happen in a "pooling equilibrium". The pass-through of households' tastes to portfolio allocations in a segmenting equilibrium is thus lower than in a (counterfactual) pooling equilibrium because segmentation increases the intermediaries' effective market power.

The segmentation of households across intermediaries matters for the pass-through only when competition is imperfect and intermediaries have some market power. Indeed the pass-through in a segmenting equilibrium converges to the one in a (counterfactual) pooling equilibrium as the degree of competition increases—either because of increasing substitutability $\sigma \to \infty$ or rising number of intermediaries $J \to \infty$ such that $\pi_j = 0$ for all j. The following lemma formalizes this result.

Lemma 4 (Irrelevance of segmentation)**.** *When $\sigma \to \infty$ or $J \to \infty$ for all j, the allocation in a segmenting equilibrium converge to the one in the (counterfactual) pooling equilibrium. In particular, an increase in all households' tastes for amenity assets $d\alpha$ leads to the following increase in the shares*

$$da = \begin{cases} \frac{1+r_N-\delta}{r_N-r_A} d\alpha \quad as \quad \sigma \to \infty \\ \frac{1+r_N-\delta}{r_N-r_A} \frac{\sigma(1-\chi)}{1+\sigma(1-\chi)} d\alpha \quad as \quad \pi \to 0 \end{cases} \tag{30}$$

4.3 Pass-through of the taste for amenity assets of intermediaries

I now consider an increase in the taste for amenity assets of intermediaries. Like for the households' taste, the degree of segmentation in equilibrium is an important determinant of the pass-through. To see this, the following proposition derives the partial equilibrium expression for the pass-through.

Proposition 4. *Assume that r_N and r_A are fixed. The partial equilibrium change in the portfolio share in amenity assets is given by*

$$\frac{\partial a_j}{\partial \chi_j} = \frac{1+r_N-\delta}{r_N-r_A} \frac{1+\sigma \sum_{t\in\mathcal{T}} \frac{f_t \pi_{jt}}{\pi_j}(1-\alpha_t)(1-\pi_{jt})}{\left(1+(1-\chi_j)\sigma \sum_{t\in\mathcal{T}} \frac{f_t \pi_{jt}}{\pi_j}(1-\pi_{jt})\right)^2}, \tag{31}$$

As in the household-taste case, segmentation increases market power. Formally this reduces the denominator by Jensen's inequality $\sum_{t\in\mathcal{T}} \omega_{jt}(1-\pi_{jt})$ relative to the (counterfactual) pooling equilibrium in which $\pi_{jt} = \pi_j$ for all t. A lower value of the denominator — corresponding to higher market power — mechanically increases pass-through. Stronger segmentation increases market power, which in turn implies that intermediaries can pass-through their tastes without losing too many clients. As shown in Lemma 4, the degree of segmentation is irrelevant for the pass-through of tastes χ_j when the substitutability across intermediaries is infinite $\sigma \to \infty$. In that case, the pass-through is zero.

4.4 General equilibrium: reallocation of market shares

The analysis above held prices (r_N, r_A) and market shares $\{\pi_{jt}\}_{jt}$ fixed. However these are equilibrium objects that also move as preferences changes. In this section, I analyze the reallocation of market shares across intermediaries. The general equilibrium adjustment in returns has been discussed in Section 3.8.

The reallocation of market shares may amplify or dampen the partial equilibrium pass-through. Whether it amplifies or dampens this pass-through depends on the relative strength of the taste for amenity assets of households and intermediaries as well as on how it affects the intermediaries' degree of market power. In the special case in which no households and no intermediary but one have a taste for amenity assets, I show that the partial equilibrium pass-through of an increase in the taste of one intermediary is mitigated by the migration of households to other intermediaries in general equilibrium. In addition, this offsetting effect is stronger the stronger the intermediary's preference for amenity assets as competitive forces arbitrage away deviations from the average financial contract.

To understand the impact of the change in the tastes for amenity assets on market shares $\{\pi_{jt}\}_{jt}$, it is useful to start with a decomposition of the aggregate portfolio share in amenity assets. The aggregate portfolio share in amenity assets can be written as the average of the portfolio share in amenity assets of all intermediaries:

$$\bar{a} = \sum_{j \in J} \pi_j a_j. \tag{32}$$

One can decompose the change in the aggregate amenity share following a shift in the preference parameter ("p") of some households or of an intermediary into the change in intermediaries' portfolios and the reallocation of funds across intermediaries:

$$\frac{d\bar{a}}{dp} = \sum_j \underbrace{\pi_j \frac{\partial a_j}{\partial p}}_{\Delta \text{ portfolio share of j}} + \sum_{j' \neq j} \sum_{t \in \mathcal{T}} \underbrace{\frac{\partial \pi_{j't}}{\partial p}(a_{j'} - a_j)}_{\text{Reallocation of market shares}} \tag{33}$$

Let's now focus on an increase in intermediary j's taste parameter $p = \chi_j$. The reallocation of funds is especially relevant in this case: while intermediary j would like to increase its portfolio share in amenity assets, it is unclear to what extent this individual would translate into an aggregate reallocation of capital? To what extent would it be mitigated by the outflows of funds or even offset by the strategic response of other intermediaries? To see this, one can rewrite the previous decomposition into three terms: the intermediary j's portfolio adjustment, the competitors' strategic reaction and the funds reallocation across intermediaries:

$$\frac{d\bar{a}}{d\chi_j} = \underbrace{\pi_j \frac{\partial a_j}{\partial \chi_j}}_{\Delta \text{ portfolio share of j}} + \sum_{j' \neq j} \underbrace{\pi_{j'} \frac{\partial a_{j'}}{\partial \chi_j}}_{\text{Strategic reaction of j'}} + \sum_{j' \neq j} \sum_{t \in \mathcal{T}} \underbrace{\frac{\partial \pi_{j't}}{\partial \chi_j}(a_{j'} - a_j)}_{\text{Reallocation of market shares}} \tag{34}$$

I can then look at each term separately.

Change in portfolio share of intermediary j. The first effect is given by

$$\frac{\partial a_j}{\partial \chi_j} = \left.\frac{\partial a_j}{\partial \chi_j}\right|_{\text{PE}} + \sum_{t \in \mathcal{T}} f_t X_{jt} \frac{\partial \pi_{jt}}{\partial \chi_j}, \tag{35}$$

where the term $\left.\frac{\partial a_j}{\partial \chi_j}\right|_{\text{PE}}$ corresponds to the partial equilibrium change given by equation (31) and the second term corresponds to a novel effect stemming from the change in market shares, $\frac{\partial \pi_{jt}}{\partial \chi_j}$. Intuitively, the increase in the portfolio shares in amenity assets at intermediary j triggers a change in market shares which changes the segmentation and market power of this intermediary, which in turns changes its incentives to increase the portfolio share in amenity assets. The strength of this general equilibrium channel depends on X_{jt} whose expression is given in Appendix A.4.

In the special case where all households have the same tastes, $\alpha_t = \alpha$, it simplifies to

$$\frac{\partial a_j}{\partial \chi_j} = \left.\frac{\partial a_j}{\partial \chi_j}\right|_{\text{PE}} + \frac{(1 + r_N - \delta)\sigma(1 - \chi_j)}{(r_N - r_A)\left(1 + (1 - \chi_j)\sigma(1 - \pi_j)\right)^2}(\chi_j - \alpha)\frac{\partial \pi_j}{\partial \chi_j}. \tag{36}$$

The sign of the right-hand-side term depends on whether intermediary j gains or loses market share $\frac{\partial \pi_j}{\partial \chi_j}$ as well as whether χ_j is smaller or larger than α. Note that when $\chi_j = \alpha$, this effect is zero. If χ_j is higher than α, an increase in market share $\frac{\partial \pi_j}{\partial \chi_j} > 0$ incentivizes the intermediary to invest more in amenity assets to take advantage of this increase in market power to pass-through more of its own taste. On the contrary when α is higher than χ_j, an increase in market share $\frac{\partial \pi_j}{\partial \chi_j} > 0$ limits the increase in the portfolio share in amenity assets because the rise in market power enables the intermediary to internalize less their clients' tastes.

Strategic reaction of competitors. The second effect, which captures the change of the portfolio share in amenity assets of other intermediaries, is given by

$$\frac{\partial a_{j'}}{\partial \chi_j} = \sum_{t \in \mathcal{T}} f_t X_{j't} \frac{\partial \pi_{j't}}{\partial \chi_j} \tag{37}$$

which is similar to the novel term just analyzed in the first effect and where the term $X_{j't}$ is defined in Appendix A.4. In the special case where all households have the same tastes, $\alpha_t = \alpha$, this expression simplifies to

$$\frac{\partial a_{j'}}{\partial \chi_j} = \frac{(1 + r_N - \delta)(1 - \chi_{j'})\sigma}{(r_N - r_A)(1 + \tilde{\sigma}_{j'}(1 - \chi_{j'}))^2}(\chi_{j'} - \alpha)\frac{\partial \pi_{j'}}{\partial \chi_j}. \tag{38}$$

The intuition is the same as before. When intermediary j' has a higher taste for amenity assets than households $\chi_{j'} > \alpha$ and funds flow into intermediary j', $\frac{\partial \pi_{j'}}{\partial \chi_j} > 0$, then this term is positive: the additional market power implies an increase in amenity investments.

Reallocation of market shares. The reallocation of market shares—the third effect in the decomposition above—is given by

$$\frac{\partial \pi_{j't}}{\partial \chi_j} = -\sigma \pi_{j't} \pi_{jt} \left(\frac{1}{1 + r_j} \frac{\partial r_j}{\partial \chi_j} + \frac{\alpha_t}{a_j} \frac{\partial a_j}{\partial \chi_j} \right). \tag{39}$$

It depends on two opposing forces: the equilibrium response of the portfolio share in amenity assets, a_j, which is expected to be positive, and the change in interest rate, r_j which is expected to be negative. Which effect is stronger determines whether funds flow away from the intermediaries that increase their portfolio shares $\left(\frac{\partial \pi_{j't}}{\partial \chi_j} < 0 \right)$ or flow into $\left(\frac{\partial \pi_{j't}}{\partial \chi_j} > 0 \right)$, and depends on the households' preferences for amenity assets, α_t. When households value only returns $\alpha_t = 0$ for all $t \in \mathcal{T}$, the market share of intermediary j decreases unambiguously which is the special case I now investigate.

Special case. Consider a situation in which only one intermediary has some taste for amenity assets, $\chi_j > 0$. Households and other intermediaries $j' \neq j$ have no taste $\alpha_t = \chi_{j'} = 0$. The following proposition derives an analytical expression for the change in the aggregate shares in amenity assets, including for the reallocation of market shares.

Proposition 5. *Assume $\alpha = \chi_{j'} = 0$ for all $j' \neq j$, and $\chi_j > 0$. Then*

$$\frac{\partial \bar{a}}{\partial \chi_j} = \frac{(1 + r_N - \delta)\pi_j}{(r_N - r_A)(1 + \sigma(1 - \pi_j)(1 - \chi_j))^2} \left[1 + \sigma(1 - \pi_j) - \frac{\chi_j\,(1 + \sigma(1 - \chi_j))\,(1 - \pi_j)\sigma}{(1 - \chi)(1 + \sigma(1 - \chi) + \sigma\chi\pi_j)}\right] \tag{40}$$

In this special case, there are two competing effects. In partial equilibrium, intermediary j would like to increase its investment in amenity assets, corresponding to the first term $1 + \sigma(1 - \pi_j)\pi_j \frac{\partial a_j}{\partial \chi_j}$ which is positive. But in general equilibrium, households move away from intermediary j as its interest rate goes down and households have no taste for amenity assets, which corresponds to the second term $\frac{\chi_j(1+\sigma(1-\chi_j))(1-\pi_j)\sigma}{(1-\chi)(1+\sigma(1-\chi)+\sigma\chi\pi_j)}$. This second effect can be very large when the taste for amenity assets of intermediaries j is already high. This is because a high taste of intermediary j for amenity assets means a large gap between its amenity shares a_j and those of its competitors, $a_{j'} = 0$.

This result is important because it says that when households don't value amenity assets, the increase in the taste for amenity assets of one intermediary—and by extension, a subset of intermediaries—is offset by the migration of households towards intermediaries that don't invest in amenity assets. This offsetting effect is stronger, the stronger the intermediary's preferences for amenity assets.

5 Government Policy

Given the results of the previous sections, a natural question is whether policy can complement tastes in directing funds to amenity assets and which is most effective depending on the degree of competition. I look at three realistic policies: a Pigouvian tax on the use of normal capital, a tax-subsidy on banks based on the composition of their investment—for example banks' capital requirements that are function of their portfolio share in amenity assets— and a tax-subsidy to households based on the portfolio of the intermediary in which they invest.

5.1 Pigouvian taxation

A Pigouvian tax can correct for the overuse of normal inputs in the production of the final good. Denote τ^C the Pigouvian tax on normal capital. Using the optimality condition of the final good producers the level of the tax τ^C that implements the efficient allocation is implicitly defined by:

$$\frac{r_N(K_N^*, K_A^*)(1+\tau^C)}{r_A(K_N^*, K_A^*)} = \frac{\theta_N}{\theta_A}\left(\frac{K_N^*}{K_A^*}\right)^{-1/\eta} \tag{41}$$

In contrast with the results obtained in the previous sections and in the financial-sector policies analyzed below, the effectiveness of the Pigouvian tax is independent of the degree of competition in the financial system. This is because the tax targets directly the users of normal and amenity capital.

However, Pigouvian taxation is often difficult to implement in practice. In the context of climate mitigation, for example, carbon taxation has faced persistent political and administrative obstacles. This motivates broadening the set of tools available to address externalities to include financial-sector policies.

5.2 Tax on banks or capital requirements

I now introduce a tax on profits that is a function of the portfolio share in amenity assets which I interpret as a capital requirement that depends on the intermediary's amenity portfolio. With such a tax, profits are given by

$$[(r_A - r_j)a_j + (r_N - r_j)(1-a_j) - \delta]\,\pi_j(1-\tau(a_j)). \tag{42}$$

The tax is assumed to be decreasing in the share of amenity assets. For the sake of tractability, I assume the net of tax rate is log-linear in the portfolio share in amenity assets a_j following Benabou (2002), Heathcote, Storesletten, and Violante (2017) and Capelle and Matsuda (2025):

$$\tau(a_j) = 1 - (1-\tau_0^I)a_j^{\tau_1^I} \tag{43}$$

where τ_0^I captures the intercept of the tax schedule and τ_1^I captures the degree to which it depends on the share of amenity assets in the portfolio. In the extreme case where $\tau_1^I = 0$ it is just a proportional tax on profits. The intercept is chosen so that the tax-subsidy scheme is self-financing: tax receipts from the banks that invest little in amenity assets fund the subsidies to banks that invest relatively more in amenity assets, so that net taxes are zero on aggregate:[7]

$$(1-\tau_0^I)\int c_j a_j^{\tau_1^I} dj = \int c_j dj. \tag{44}$$

It is helpful to think of τ_1^I as exogenous and τ_0^I as endogenously chosen so that equation (44) holds.

Lemma 5. *With this tax and subsidy scheme, the utility of a financial intermediary can be written as:*

$$\max_{r_j,a_j} \quad (1-\chi)\ln\left(\left[(r_A-r_j)a_j+(r_N-r_j)(1-a_j)-\delta\right]\pi_j\right)+(\tau_1^I+\chi)\ln a_j+\ln(1-\tau_0^I). \tag{45}$$

The amenity-specific capital requirements acts exactly like a stronger taste for amenity assets. One can indeed divide through the utility function by $(1+\tau_1^I)$ and relabel $\chi' = \frac{\chi+\tau_1^I}{1+\tau_1^I}$. With this new labeling, it is clear that all the results derived in Sections 3 and 4 for an increase in χ would also apply to an increase in τ_1^I.

Proposition 6. *Assume $\chi < 1$. Qualitatively, an increase in the policy parameter τ_1^I has the same implications as an increase in intermediaries tastes, χ.*

First the effectiveness of a decrease in the capital requirement for amenity assets, τ_1^I, that affects all intermediaries decreases with the degree of competition (Proposition 2). In the extreme case of perfect competition, it is ineffective. Second the effect of an increase in the capital requirement for amenity assets is dampened by segmentation (Proposition 4). Third, an increase in the capital requirement for amenity assets of a subset of intermediaries is mitigated by a flow of funds towards non-regulated intermediaries when households have low preferences for amenity assets and when substitutability is strong (Proposition 5).[8]

5.3 Amenity-specific households capital income tax

I now allow for amenity-specific capital income tax to households. More specifically, the government proposes an income tax schedule that depends on the share of amenity assets

[7] This way of modeling the tax and subsidy scheme avoids having to specify a tax or rebate to households. The specifics of the redistributive scheme don't affect the results.

[8] A change in the tax parameter is only qualitatively and not quantitatively the same as a change in preferences χ because the former parameter is also in the denominator of $\chi' = \frac{\chi+\tau_1^I}{1+\tau_1^I}$.

in the intermediaries' portfolio chosen by the household. The household's consumption is now given by

$$c_i = (1 + r_j)(1 - \tau(a_j))s \tag{46}$$

As before, the tax schedule is assumed to be log-linear in the portfolio share in amenity assets a_j:

$$\tau(a_j) = 1 - (1 - \tau_0^H)a_j^{\tau_1^H} \tag{47}$$

where τ_0^H captures the average level of the tax and τ_1^H captures the degree to which it depends on the share of amenity assets in the portfolio.

Lemma 6. *With this tax-subsidy scheme, the households' utility can be written as*

$$u_{ij} = \ln(1 + r_j)s_i + (\tau_1^H + \alpha)\ln a_j + \ln(1 - \tau_0^H)\epsilon_{ij} \tag{48}$$

This expression makes clear that one can think of this amenity-specific tax-subsidy as an increase in α. It acts exactly like a stronger taste for amenity assets, one can indeed replace α with $\alpha' = \alpha + \tau_1^H$ everywhere in the previous analysis and the results would go through.

Proposition 7. *An increase in the policy parameter τ_1^H has the same implications as an increase in households' tastes, α.*

The results derived for α in Section 3 therefore apply here. In particular the effectiveness of an increase in the tax rebates for greener intermediaries, τ_1^H, increases with the degree of competition (Proposition 1). This suggests that this policy can be especially attractive in a country with competitive markets for funds.

5.4 Numerical application to green finance

In this section, I quantify some of the effects analyzed in the previous sections for the case of green investments. I start by calibrating the model using parameters from the literature and empirical targets. I then draw the policy frontiers—the combinations of policy instruments that implement the efficient allocation—for different degrees of competition across intermediaries.

Calibration. I now provide a sketch of the calibration strategy. More details can be found in Appendix A.5. The elasticity of substitution between green and normal capital η is set to 1 following Golosov et al. (2014), which they borrow from the review by Stern (2006). They set the relative cost of green and regular technologies to unity, which is consistent with this paper's assumption that the production function of green and regular capital are identical.

The output elasticity to capital κ is calibrated using the complement to one of the labor share, $\kappa = .4$ (Penn World Table 10.01 2025). Using the same Penn World Table, I compute an output to capital ratio of about 3. This leads to an average rent to capital of $r^* = 13.3\%$.

The literature suggests that the greenium is very small (Pietsch and Salakhova 2022). I thus set the preference parameters of both households and intermediaries to zero, $\chi = \alpha = 0$. In addition, the price of carbon in the U.S. is about \$2 in 2021 (OECD 2025). Using the estimate that a carbon tax of \$50 would raise 1% of GDP (Congressional Budget Office 2013) and that the most carbon-intensive sectors account for 20% of GDP (U.S. Bureau of Labor Statistics 2025), one can calibrate the value of τ^C corresponding to \$2 in the decentralized equilibrium of the model: $\tau^C = .015$.

To calibrate the value of θ_N and θ_A, I then use the optimality condition of final-good producers (13) together with the fact that the greenium is zero, $r_A = r_N$, which gives $\frac{\theta_A}{\theta_N} = 3.94$. I can then back out the level of the technological parameters using $\theta_N + \theta_A = 1$, which gives $\theta_A = .8$ and $\theta_N = .2$.

The target for the optimal carbon tax is a social cost of carbon of \$100 which is in the range of estimates in the literature (U.S. Environmental Protection Agency 2023). This value is 50 times higher than the actual value. From this target, I can recover the efficient share a^* using the calibrated elasticity of substitution above:

$$1 + \tau^{C*} = 1 + 50 \times .015 = \frac{\theta_N}{\theta_A} \left(\frac{1 - a^*}{a^*} \right)^{-1/\eta} \Rightarrow a^* = 87.5\% \tag{49}$$

Using a log-linear function for the externality $z = (K_N/S)^{-\rho}$, one can also recover the implied externality parameter, $\rho = .06$. Finally, we calibrate the size of savings S to match the ratio of capital to output of 3: $S = 4.53$.

The greenium required to implement the same allocation implied by a \$100 carbon price is thus $r_N^* - r_A^* = 10.17\%$. It is substantially larger than what is observed empirically. This greenium is obtained by comparing the return on amenity, $r_A^* = 13.57\%$, and on normal capital, $r_N^* = 23.75\%$.

Results: Policy Possibility Frontier. With this calibration, one can draw policy possibility frontiers, *i.e.* the combinations of policy instruments that implement the efficient allocation. I do so for a range of degrees of competition across intermediaries, $\tilde{\sigma}$.[9] Concretely I solve for the pair of tax parameters on intermediaries' profits τ_1^I and households' capital income τ_1^H that implements the efficient allocation. Both τ_1^I and τ_1^H can be interpreted as the elasticity of the net of tax rate to the portfolio share in amenity assets. To translate this elasticity into a marginal tax rate, I divide the elasticity by a^*. This interpretation as marginal tax rate is exact when the level of the rebate is such that the tax payment is exactly zero at a^*.[10]

I show the results in Figure 4. When competition is strong ($\tilde{\sigma} = 11$)—for example in the U.S.—implementing the optimal amenity premium would require a marginal tax rate on intermediaries' profits associated with their dirty investments of 50% but only 9% on households capital income. This suggests that in this context, a tax on households income is more effective. Conversely, in markets that are not very competitive ($\tilde{\sigma} = .1$), the required marginal tax rate on intermediaries profits should be only 8% but would need to be as high as 85% on households capital income. This suggests that in this context, it is more effective to give incentives to intermediaries than to households.

6 Conclusion

This paper studies how investing tastes—such as preferences for environmentally friendly, socially and geopolitically desirable activities—are transmitted to real investment through the structure of financial intermediation. While such motives are often viewed

[9]In the literature, there are a few estimates of the elasticity of substitution, σ. They mostly capture substitution across countries or across firms within an asset class (equity, bonds) and range from 1 to 10 (Koijen and Yogo 2019; Capelle and Pellegrino 2025). There is also a large variation in the degree of concentration in financial markets across countries and asset classes. Figure 2 gives a sense of the dispersion in concentration levels in the banking sector across countries. Broadridge (2018) reports Herfindhal indices for several segments of financial intermediation in the U.S. and find large variation with ETFs at 2480, Indexed Mutual Funds at 5872, and Close-end Funds at 792.

[10]By definition of the elasticity we have $\frac{d\log(1-\tau(a))}{d\log a} = \tau_1^I \iff \frac{d(1-\tau(a))/(1-\tau(a))}{da/a} = \tau_1^I$. Assuming the rebate is such that $\tau(a^*) = 0$ we have $-\frac{d\tau(a)}{da} \times a = \tau_1$. Hence the result that τ_1^I/a can be interpreted as the marginal tax rate.

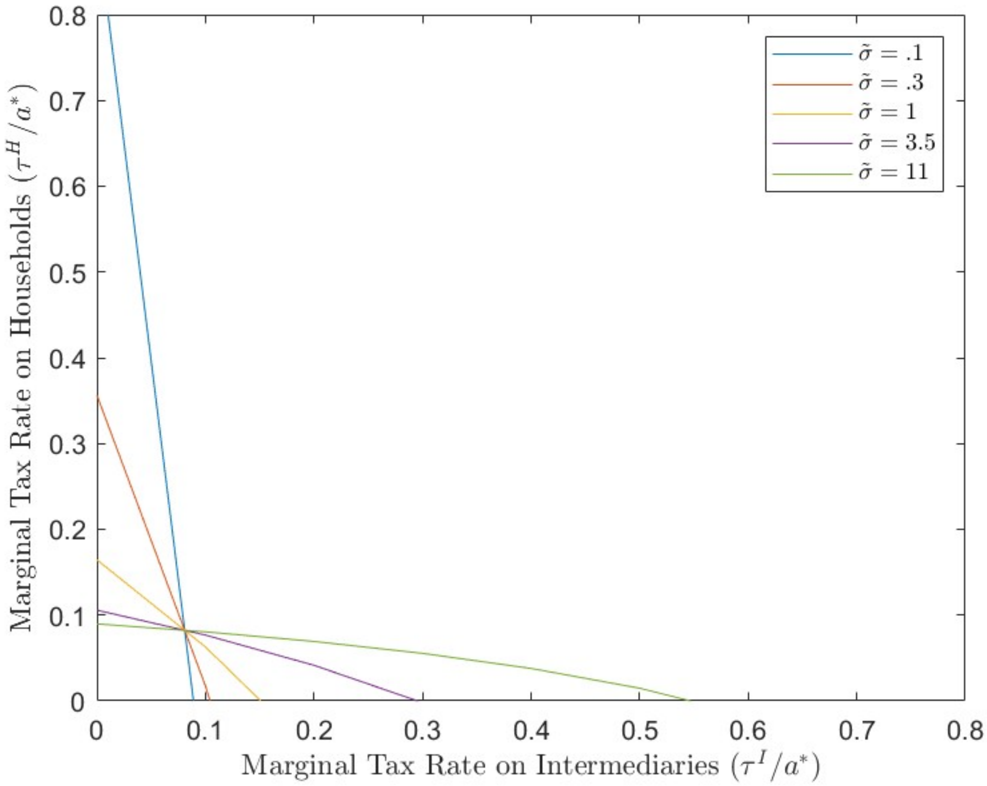

Figure 4: Policy Possibility Frontier

Note: Each line shows combinations of τ_1^I/a^* and τ_1^H/a^* that yield the amenity-asset share consistent with an efficient allocation, under different degrees of competition $\tilde{\sigma}$.

as a promising channel through which private finance can support societal objectives, the analysis shows that their effectiveness depends critically on market structure and on where these motives originate within the financial system.

The pass-through of households' taste for amenity assets is stronger when competition among intermediaries is strong, as competitive pressure forces intermediaries to cater to investor preferences. By contrast, an increase in intermediaries' own taste for amenity assets is effective only when competition is limited. As a result, competition and households' motives are complements, while competition and intermediaries' motives are substitutes. When households and intermediaries are heterogeneous, segmenting equilibria emerge with positive assortative matching. In general this endogenous segmentation increases market power and shapes the pass-through of preferences.

The effectiveness of regulatory and fiscal instruments mirrors the logic of private motives:

Policies that operate through households—such as tax incentives based on portfolio composition—are most effective in competitive financial systems. Policies that operate through intermediaries—such as portfolio-based capital requirements—are more effective when intermediation is concentrated. The paper applied these ideas to green finance and showed their quantitative importance.

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A Proof

A.1 Final Good Producers

The problem of final good producers is given by

$$\max_{y,k_A,k_N} \quad \left[\theta_A k_A^{1-\frac{1}{\eta}} + \theta_N k_N^{1-\frac{1}{\eta}}\right]^{\frac{\kappa\eta}{\eta-1}} - r_N(1+\tau)k_N - r_A k_A \tag{50}$$

The F.O.Cs are

$$(k_A) \quad \theta_A k_A^{-1/\eta} \left[\theta_A k_A^{1-\frac{1}{\eta}} + \theta_N k_N^{1-\frac{1}{\eta}}\right]^{\frac{\kappa\eta}{\eta-1}-1} = r_A \tag{51}$$

$$(k_N) \quad \theta_N k_N^{-1/\eta} \left[\theta_A k_A^{1-\frac{1}{\eta}} + \theta_N k_N^{1-\frac{1}{\eta}}\right]^{\frac{\kappa\eta}{\eta-1}-1} = r_N(1+\tau^C) \tag{52}$$

Combining the first two F.O.Cs gives (13):

$$\frac{r_N(1+\tau^C)}{r_A} = \frac{\theta_N}{\theta_A}\left(\frac{k_N}{k_A}\right)^{-1/\eta} \tag{53}$$

Which gives $k_N = \left(\frac{r_A}{r_N+\tau^C}\frac{\theta_N}{\theta_A}\right)^{\eta} k_A$.

A.2 Households

The solution to the portfolio problem coincides with the solution to the simpler following problem:

$$\max_j = \ln(1+r_j) + \alpha \ln a_j + \epsilon_j \tag{54}$$

where a_j is the share of amenity assets in j's portfolio. If $1/\sigma$ is the inverse of the dispersion of the shocks for intermediary j across households, this leads to the following aggregate demand for j

$$\pi_j = \frac{\left[(1+r_j)a_j^{\alpha}\right]^{\sigma}}{\sum_k \left[(1+r_k)a_k^{\alpha}\right]^{\sigma}} \tag{55}$$

A.3 Financial Intermediaries

Investor j is to choose a strategy (r_j, a_j) to maximize its utility

$$\max_{r_j, a_j} \quad (1-\chi)\ln\left(\left[(r_A - r_j)a_j + (r_N - r_j)(1-a_j) - \delta\right]\pi_j\right) + \chi \ln a_j \tag{56}$$

$$\text{s.t.} \quad \pi_j = \frac{\left[(1+r_j)a_j^{\alpha}\right]^{\sigma}}{\sum_k \left[(1+r_k)a_k^{\alpha}\right]^{\sigma}} \tag{57}$$

The F.O.C. are given by:

$$(r_j) \quad \frac{\sigma(1-\chi)}{(1+r_j)}(1-\pi_j) = \frac{1-\chi}{a_j r_A + r_N(1-a_j) - r_j - \delta} \tag{58}$$

$$(a_j) \quad \frac{(1-\chi)\sigma\alpha}{a_j}(1-\pi_j) + \frac{\chi}{a_j} = \frac{(1-\chi)(r_N - r_A)}{a_j r_A + r_N(1-a_j) - r_j - \delta} \tag{59}$$

where I have used

$$\frac{\partial \ln \pi_j}{\partial a_j} = \frac{\frac{\partial \pi_j}{\partial a_j}}{\pi_j} = \frac{1}{\pi_j}\left[\frac{\sigma\alpha\left[(1+r_j)a_j^\alpha\right]^\sigma / a_j \sum_k \left[(1+r_k)a_k^\alpha\right]^\sigma - \sigma\alpha\left[(1+r_j)a_j^\alpha\right]^{2\sigma} / a_j}{\left(\sum_k \left[(1+r_k)a_k^\alpha\right]^\sigma\right)^2}\right] \tag{60}$$

$$= \frac{1}{\pi_j}\sigma\alpha\frac{\pi_j - \pi_j^2}{a_j} = \frac{\sigma\alpha(1-\pi_j)}{a_j} \tag{61}$$

and the exact same derivation applies for $(1+r_j)$: $\frac{\partial \ln \pi_j}{\partial a_j} = \frac{\sigma(1-\pi_j)}{1+r_j}$.

I now rearrange these F.O.C. to get a easier to interpret formula.

$$(r_j) \quad (a_j r_A + r_N(1-a_j) - r_j - \delta)(1-\pi_j)\sigma = (1+r_j) \tag{62}$$

$$(a_j) \quad (a_j r_A + r_N(1-a_j) - r_j - \delta)((1-\chi)\alpha\sigma(1-\pi_j) + \chi) = a_j(1-\chi)(r_N - r_A) \tag{63}$$

Let's call $\tilde{\sigma}_j = \sigma(1-\pi_j)$. The first equation gives the level of mark-ups:

$$a_j r_A + r_N(1-a_j) - r_j - \delta = \frac{1+r_j}{\tilde{\sigma}_j} \tag{64}$$

This equation is the usual markup equation. It is decreasing in the elasticity of substitution and market share, $\tilde{\sigma}_j = \sigma(1-\pi_j)$.

I take the ratio between the two previous F.O.C to eliminate the level of profits and get a simpler expression for the share of amenity investment:

$$\frac{\tilde{\sigma}_j}{(1-\chi)\alpha\tilde{\sigma}_j + \chi} = \frac{(1+r_j)}{a_j(1-\chi)(r_N - r_A)}$$

$$\iff (1+r_j) = \frac{\tilde{\sigma}_j}{\alpha\tilde{\sigma}_j + \chi/(1-\chi)}(r_N - r_A)a_j$$

$$\iff (r_N - r_A)a_j = (1+r_j)\frac{\alpha\tilde{\sigma}_j + \chi/(1-\chi)}{\tilde{\sigma}_j}$$

$$\iff a_j = \frac{1+r_j}{r_N - r_A}\left[\alpha + \frac{\chi}{(1-\chi)\tilde{\sigma}_j}\right] \tag{65}$$

Finally, it will be useful later to derive an equation that isolate r_j by combining the one but last line with the mark-down equation:

$$\frac{r_N - r_j - \delta}{1+r_j} = \frac{1}{(1-\chi)\sigma(1-\pi_j)} + \alpha \tag{66}$$

This can also be written as

$$\frac{1+r_N-\delta}{1+r_j} = 1+\frac{1}{(1-\chi)\sigma(1-\pi_j)}+\alpha \tag{67}$$

$$= \frac{1}{(1-\chi)\sigma(1-\pi_j)}+1 \tag{68}$$

$$\iff 1+r_j = (1+r_N-\delta)\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)} \tag{69}$$

I can get a simpler expression for a_j:

$$a_j = \frac{1+r_N-\delta}{r_N-r_A}\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)}\left[\alpha+\frac{\chi}{(1-\chi)\tilde{\sigma}_j}\right] = \frac{1+r_N-\delta}{r_N-r_A}\left[\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)}\alpha+\frac{\chi}{1+(1-\chi)\tilde{\sigma}_j}\right] \tag{70}$$

and for the mark-downs

$$a_j r_A + r_N(1-a_j) - r_j - \delta = \frac{(1+r_N-\delta)(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)} \tag{71}$$

Comparative statics with respect to α

$$\frac{\partial a_j}{\partial \alpha} = \frac{1+r_N-\delta}{r_N-r_A}\frac{\tilde{\sigma}_j(1-\chi)}{1+\tilde{\sigma}_j(1-\chi)} \tag{72}$$

Let's start with the case $\tilde{\sigma}_j \to +\infty$. I get

$$\frac{\partial a_j}{\partial \alpha} = \frac{1+r_N-\delta}{r_N-r_A}. \tag{73}$$

Alternative derivation. I now derive the same result from a different path. Start from the optimal mix of a_j and r_j: $a_j(r_N-r_A)(1/\alpha-1) = 1+r_j$ and the no profit condition $a_j r_A + r_N(1-a_j) = r_j$, I find $a_j = \frac{1+r_N-\delta}{r_N-r_A}\alpha$. Notice that this implies the exact same derivative, and also tell us that the elasticity of a_j to α is one.

The change in the mark-downs (equation (64)) is given by:

$$\frac{\partial \text{Mark-down}}{\partial \alpha} = \frac{\tilde{\sigma}_j\frac{\partial r_j}{\partial \alpha}+(1+r_j)\tilde{\sigma}_j}{(\tilde{\sigma}_j)^2} = \frac{1+r_j}{{}^2\tilde{\sigma}_j}+\frac{1}{\tilde{\sigma}_j}\frac{\partial r_j}{\partial \alpha} \tag{74}$$

Recall the expression for the derivative of the returns:

$$\frac{\partial r_j}{\partial \alpha} = -\frac{(1+r_j)^2}{1+r_N-\delta}\left[\frac{1}{(1-\chi)^2\sigma(1-\pi_j)}+\frac{1}{2}\right] \tag{75}$$

$$= -(1 + r_j) = -\frac{(1 + r_N - \delta)\tilde{\sigma}_j(1 - \chi)}{1 + \tilde{\sigma}_j(1 - \chi)} \tag{76}$$

where I use equation (69). Hence

$$\frac{\partial \text{Mark-Down}}{\partial \alpha} = \frac{1 + r_j}{{}^2\tilde{\sigma}_j} - \frac{1}{\tilde{\sigma}_j}\frac{1 + r_j}{1 - \alpha} = 0 \tag{77}$$

Comparative statics with respect to χ

$$\frac{\partial a_j}{\partial \chi} = \frac{1 + r_N - \delta}{r_N - r_A}\left[\frac{-\tilde{\sigma}_j(1 + \tilde{\sigma}_j(1 - \chi)) + \tilde{\sigma}_j^2(1 - \chi)}{(1 + \tilde{\sigma}_j(1 - \chi))^2}\alpha + \frac{(1 + \tilde{\sigma}_j(1 - \chi) + \chi\tilde{\sigma}_j}{(1 + \tilde{\sigma}_j(1 - \chi))^2}\right] \tag{78}$$

$$= \frac{1 + r_N - \delta}{r_N - r_A}\frac{-\tilde{\sigma}_j\alpha + 1 + \tilde{\sigma}_j}{(1 + \tilde{\sigma}_j(1 - \chi))^2} \tag{79}$$

I compute the derivative of this coefficient with respect to $\tilde{\sigma}_j$:

$$\frac{\partial \frac{1 + \tilde{\sigma}_j(1 - \alpha)}{(1 + \tilde{\sigma}_j(1 - \chi))^2}}{\partial \tilde{\sigma}_j} = \frac{(1 - \alpha)(1 + \tilde{\sigma}_j(1 - \chi))^2 - (1 + \tilde{\sigma}_j(1 - \chi))2(1 - \chi)(1 + \tilde{\sigma}_j(1 - \alpha))}{(1 + \tilde{\sigma}_j(1 - \chi))^2} \tag{80}$$

$$= \frac{(1 - \alpha)(1 + \tilde{\sigma}_j(1 - \chi)) - 2(1 - \chi)(1 + \tilde{\sigma}_j(1 - \alpha))}{(1 + \tilde{\sigma}_j(1 - \chi))} \tag{81}$$

$$= \frac{1 - \alpha - 2(1 - \chi) - \tilde{\sigma}_j(1 - \chi)(1 - \alpha)}{(1 + \tilde{\sigma}_j(1 - \chi))} \tag{82}$$

This is negative if and only

$$1 - \alpha - 2(1 - \chi) - \tilde{\sigma}_j(1 - \alpha)(1 - \chi) < 0 \tag{83}$$

$$\iff 1 - \chi > \frac{1 - \alpha}{2 + \tilde{\sigma}_j(1 - \alpha)} \tag{84}$$

Interest rates, mark-down and profits decrease:

$$\frac{\partial r_j}{\partial \chi} = -\frac{\tilde{\sigma}_j}{1 + \tilde{\sigma}_j(1 - \chi)} \qquad \frac{\partial \text{Mark-Down}}{\partial \chi} = -\frac{1}{1 + \tilde{\sigma}_j(1 - \chi)} \tag{85}$$

Heterogeneous household preferences α_t This appendix derives the equilibrium conditions when households are heterogeneous in their taste for amenity assets.

Let households be partitioned into a finite set of types indexed by $t \in \mathcal{T}$, each with population share f_t and preference parameter α_t, with $\sum_{t \in \mathcal{T}} f_t = 1$. Let π_{jt} denote the share of type-t

households investing in intermediary j, and define the total market share of intermediary j as

$$\pi_j \equiv \sum_{t\in\mathcal{T}} f_t \pi_{jt}.$$

The composition of intermediary j's investor base is given by

$$\omega_{jt} \equiv \frac{f_t \pi_{jt}}{\pi_j},$$

so that $\sum_{t\in\mathcal{T}} \omega_{jt} = 1$.

Demand elasticities. The derivative of π_j with respect to the amenity portfolio share a_j is

$$\frac{\partial \pi_j}{\partial a_j} = \sum_{t\in\mathcal{T}} f_t \frac{\partial \pi_{jt}}{\partial a_j} = \sum_{t\in\mathcal{T}} f_t \frac{\sigma \alpha_t}{a_j} \pi_{jt}(1-\pi_{jt}) \tag{86}$$

$$= \frac{\sigma \pi_j}{a_j} \sum_{t\in\mathcal{T}} \omega_{jt} \alpha_t (1-\pi_{jt}). \tag{87}$$

Hence,

$$\frac{1}{\pi_j}\frac{\partial \pi_j}{\partial a_j} = \frac{\sigma}{a_j} \sum_{t\in\mathcal{T}} \omega_{jt} \alpha_t (1-\pi_{jt}). \tag{88}$$

Define the effective market-power term faced by intermediary j as

$$m_j \equiv \sum_{t\in\mathcal{T}} \omega_{jt}(1-\pi_{jt}).$$

Note that

$$\sum_{t\in\mathcal{T}} \omega_{jt} \alpha_t (1-\pi_{jt}) + \sum_{t\in\mathcal{T}} \omega_{jt}(1-\alpha_t)(1-\pi_{jt}) = \sum_{t\in\mathcal{T}} \omega_{jt}(1-\pi_{jt}) = m_j. \tag{89}$$

First-order conditions. The intermediary chooses (r_j, a_j) to maximize its objective. The first-order conditions with respect to r_j and a_j can be written as

$$(r_j): \quad [a_j r_A + (1-a_j) r_N - r_j - \delta]\, \sigma m_j = 1 + r_j, \tag{90}$$

$$(a_j): \quad [a_j r_A + (1-a_j) r_N - r_j - \delta] \left((1-\chi)\sigma \sum_{t\in\mathcal{T}} \omega_{jt}\alpha_t(1-\pi_{jt}) + \chi \right) = a_j(1-\chi)(r_N - r_A). \tag{91}$$

The first condition implies the mark-down equation

$$a_j r_A + (1-a_j) r_N - r_j - \delta = \frac{1+r_j}{\sigma m_j}. \tag{92}$$

Substituting (92) into the second condition yields

$$\frac{\sigma m_j}{(1-\chi)\sigma \sum_{t\in\mathcal{T}} \omega_{jt}\alpha_t(1-\pi_{jt}) + \chi} = \frac{1+r_j}{a_j(1-\chi)(r_N - r_A)} \tag{93}$$

$$\iff a_j = \frac{1+r_j}{r_N - r_A} \left[\frac{\sum_{t\in\mathcal{T}} \omega_{jt}\alpha_t(1-\pi_{jt})}{\sum_{t\in\mathcal{T}} \omega_{jt}(1-\alpha_t)(1-\pi_{jt})} + \frac{\chi}{(1-\chi)\sigma \sum_{t\in\mathcal{T}} \omega_{jt}(1-\alpha_t)(1-\pi_{jt})} \right]. \tag{94}$$

Interest rates and portfolio shares. Combining (94) with the mark-down equation yields

$$1 + r_j = (1 + r_N - \delta) \frac{\sigma(1-\chi)m_j}{1+\sigma(1-\chi)m_j}. \tag{95}$$

Substituting (95) back into (94) gives the optimal amenity portfolio share

$$a_j = \frac{1+r_N-\delta}{r_N - r_A} \left[\frac{\sigma(1-\chi)\sum_{t\in\mathcal{T}} \omega_{jt}\alpha_t(1-\pi_{jt})}{1+\sigma(1-\chi)m_j} + \frac{\chi}{1+\sigma(1-\chi)m_j} \right]. \tag{96}$$

The corresponding mark-down is

$$a_j r_A + (1-a_j) r_N - r_j - \delta = \frac{(1+r_N-\delta)(1-\chi)}{1+\sigma(1-\chi)m_j}. \tag{97}$$

A.4 General equilibrium

Expression for X_j

$$X_{jt} = Y_j \frac{1}{\pi_j} \left[(1-2\pi_{jt}) \left[\alpha_t - \chi_j + \sigma(1-\chi_j)\alpha_t \sum_{t'\in\mathcal{T}} \omega_{jt}(1-\pi_{jt}) \left(1 - \frac{\alpha_{t'}}{\alpha_t}\right) \right] - \sum_{t'\in\mathcal{T}} \omega_{jt'}(1-\pi_{jt'})(\alpha_{t'} - \chi_j) \right] \tag{98}$$

$$Y_j = \frac{(1+r_N-\delta)\sigma(1-\chi_j)}{(r_N-r_A)\left(1+(1-\chi_j)\sigma\sum_{t\in\mathcal{T}}\frac{f_t\pi_{jt}}{\pi_j}(1-\pi_{jt})\right)^2} \tag{99}$$

When all households have the same preferences $\alpha_t = \alpha$ the expression for X_{jt} simplifies to

$$X_{jt} = Y_j\frac{1}{\pi_j}\left[(1-2\pi_j)(\alpha-\chi_j)-(1-\pi_j)(\alpha-\chi_j)\right] = -Y_j(\alpha-\chi_j) \tag{100}$$

Special case

$$\frac{\partial a}{\partial \chi_j} = \pi_j\frac{\partial a_j}{\partial \chi_j} + \frac{\partial \pi_j}{\partial \chi_j}a_j \tag{101}$$

$$= \pi_j\frac{(1+r_N-\delta)}{(r_N-r_A)(1+\sigma(1-\pi_j)(1-\chi_j))^2}\left[1+\sigma(1-\pi_j)+(1-\chi_j)\sigma\chi_j\frac{\partial\pi_j}{\partial\chi_j}\right] \tag{102}$$

$$+\frac{\partial \pi_j}{\partial \chi_j}\frac{1+r_N-\delta}{r_N-r_A}\frac{\chi_j}{1+\sigma(1-\pi_j)(1-\chi_j)} \tag{103}$$

Next I combine

$$\frac{\partial \pi_j}{\partial \chi_j} = \sigma\pi_j(1-\pi_j)\frac{1}{1+r_j}\frac{\partial r_j}{\partial \chi_j} \tag{104}$$

and

$$\frac{\partial r_j}{\partial \chi_j} = \frac{1+r_N-\delta}{(1+\tilde{\sigma}_j(1-\chi_j))^2}\left(-\tilde{\sigma}_j-(1-\chi_j)\frac{\partial\pi_j}{\partial\chi_j}\right) \tag{105}$$

to get

$$\frac{\partial \pi_j}{\partial \chi_j} = \frac{-K\tilde{\sigma}_j}{1+K\sigma(1-\chi_j)} \tag{106}$$

$$\text{with} \quad K = \frac{\sigma\pi_j(1-\pi_j)}{1+r_j}\frac{1+r_N-\delta}{(1+\tilde{\sigma}_j(1-\chi_j))^2} \tag{107}$$

Replacing gives

$$\frac{\partial \bar{a}}{\partial \chi_j} = X\left[\frac{\pi_j}{(1+\sigma(1-\pi_j)(1-\chi_j))}\left[1+\sigma(1-\pi_j)+(1-\chi_j)\sigma\chi_j\frac{\partial\pi_j}{\partial\chi_j}\right]+\frac{\partial\pi_j}{\partial\chi_j}\chi_j\right] \tag{108}$$

with $X = \frac{(1+r_N-\delta)}{(r_N-r_A)(1+\sigma(1-\pi_j)(1-\chi_j))}$.

$$\frac{\partial \bar{a}}{\partial \chi_j} = X\left[\frac{\pi_j(1+\sigma(1-\pi_j))}{(1+\sigma(1-\pi_j)(1-\chi_j))} - \chi_j\left(\frac{\pi_j(1-\chi_j)\sigma}{(1+\sigma(1-\pi_j)(1-\chi_j))}+1\right)\frac{K\tilde{\sigma}_j}{1+K\sigma(1-\chi_j)}\right] \tag{109}$$

$$= X\left[\frac{\pi_j(1+\sigma(1-\pi_j))}{(1+\sigma(1-\pi_j)(1-\chi_j))} - \chi_j\left(\frac{\pi_j(1-\chi_j)\sigma}{(1+\sigma(1-\pi_j)(1-\chi_j))}+1\right)\frac{(1-\pi_j)\pi_j\sigma}{(1-\chi)(1+\sigma(1-\chi)+\sigma\chi\pi_j)}\right] \tag{110}$$

$$= X_2\left[1+\sigma(1-\pi_j) - \frac{\chi_j\,(1+\sigma(1-\chi_j))\,(1-\pi_j)\sigma}{(1-\chi)(1+\sigma(1-\chi)+\sigma\chi\pi_j)}\right] \tag{111}$$

with $X_2 = \frac{(1+r_N-\delta)\pi_j}{(r_N-r_A)(1+\sigma(1-\pi_j)(1-\chi_j))^2}$.

A.5 Calibration

The output elasticity to capital κ is calibrated using the complement to one of the labor share, $\kappa = .4$ (Penn World Table 10.01 2025). Using the same Penn World Table, we compute an output to capital ratio of about 3. This leads to an average rent to capital of $r^* = \kappa\frac{Y}{K} = .4/3 \simeq 13.3\%$.

The literature suggests that the amenity premium is less than 5bp (Pietsch and Salakhova 2022). This implies that I can set the preference parameters of both households and intermediaries to zero, $\chi = \alpha = 0$. In addition, there is a large heterogeneity across countries in the price of carbon. In the U.S., it is about \$2 in 2021 (OECD 2025). It is calculated that a carbon tax of \$50 would currently raise 1% of GDP (Congressional Budget Office 2013). The most carbon intensive sectors account for 20% of GDP (U.S. Bureau of Labor Statistics 2025). From this I can calibrate the value of τ^C corresponding to \$2 in the decentralized equilibrium of the model: $\tau^C \times r^* \times .2 = 0.01 \times \frac{2}{50} \Rightarrow \tau^C = .015$.

To calibrate the value of θ_N and θ_A, we then use the optimality condition of final-good producers together with the fact that the greenium is null, $r_A = r_N$:

$$1+\tau^C = 1.015 = \frac{\theta_N}{\theta_A}\left(\frac{K_N}{K_A}\right)^{-1/\eta} = \frac{\theta_N}{\theta_A}\left(\frac{.2}{.8}\right)^{-1/\eta} \Rightarrow \frac{\theta_A}{\theta_N} = 4/1.015 = 3.94 \tag{112}$$

and we can then back out the levels of the technological parameters using $\theta_N + \theta_A = 1$, which gives $\theta_A = .8$ and $\theta_N = .2$.

The target for the optimal carbon tax is a social cost of carbon of \$100 which is in the range of estimates in the literature (U.S. Environmental Protection Agency 2023). This value is 50 times higher than the actual value. From this target, I can recover the efficient share a^* using the calibrated elasticity of substitution above and the market clearing conditions:

$$1+\tau^{C*} = 1+50\times .015 = \frac{\theta_N}{\theta_A}\left(\frac{1-a^*}{a^*}\right)^{-1/\eta} \Rightarrow a^* = 87.5\% \tag{113}$$

and the implied externality, using a log-linear function for the externality $z = (K_N/S)^{-\rho}$

$$\frac{1}{1+\tau^{C*}} = 1 - \frac{\left(\theta_A a^{1-1/\eta} + \theta_N(1-a)^{1-1/\eta}\right)^{\frac{\eta}{\eta-1}}}{\kappa\theta_N}\rho \Rightarrow \rho = .06. \tag{114}$$

We calibrate the size of savings S to match the ratio of capital to output of 3:

$$r^* S = \kappa(1-a)^{-\rho} S^{-\rho}\left(a^{\theta_A}(1-a)^{\theta_N}\right)^{\kappa} S^{\kappa} \Rightarrow S = 4.53 \tag{115}$$

From this we can compute the $r_A^* = z(1-a^*)\kappa(k^*)^{\kappa}/k_A = 13.57\%$, $r_N^* = r_A^* \times 1.75 = 23.75\%$ and amenity premium $r_N^* - r_A^* = 10.17\%$.

PUBLICATIONS

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