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Authenticity-Driven Motivations in Oligopoly: Efforts, Pricing, and Welfare

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Abstract

We develop an oligopoly theory of brand authenticity as a belief-based credence attribute valued by only a subset of consumers. Firms choose prices and costly authenticity efforts, while managers may derive private non-pecuniary benefits from being perceived as intrinsically motivated. Heterogeneity in consumer preferences and managerial motivations jointly determines equilibrium authenticity provision, pricing, and consumer sorting. Firms led by more authenticity-driven managers invest more and, under standard complementarity conditions, charge price premia. Authenticity is privately unsustainable when the attentive audience is small, viable when it is large, and fragile at intermediate sizes. In this fragile region, laissez-faire equilibrium exhibits inefficient exit despite socially valuable participation, reflecting an extensive-margin inefficiency that can be addressed by participation support or belief-based certification.

Key words: *Authenticity, Authenticity-Driven Motivations, Market Segmentation, Oligopoly Pricing, Non-price Competition, Welfare.*

JEL Classification: C72, D21, D42, D60, L13, L15.

1. Introduction

By *authenticity* we mean a belief-based, credence attribute capturing the extent to which a brand is *perceived* by consumers and by managers as "genuine" and "true to its claimed identity," rather than as behaving in a purely instrumental way [1]. Brand authenticity has become a salient competitive dimension in markets such as health- and sustainability-oriented goods, craft goods, culturally embedded products, and locally produced goods. Empirical work in marketing and organizational research links perceived authenticity to trust, attachment, and willingness-to-pay.[2] Yet the economic foundations of authenticity competition—why firms invest in it, how it interacts with pricing, and what it implies for market structure and welfare—remain relatively underdeveloped.

A central empirical regularity is that authenticity is not valued uniformly. In many consumer product oligopolies, only a subset of consumers places substantial value on authenticity, leading to segmented demand. The U.S. beer industry illustrates this structure: a concentrated mass-production segment coexists with a differentiated craft segment, where authenticity-oriented consumers reward producers perceived as intrinsically motivated, while mainstream consumers are primarily price-sensitive (Tremblay et al., 2005; Verhaal & Dobrev, 2022). A similar segmentation arises in mission-driven food markets operating within concentrated manufacturing and retail systems, where ethical labels increase demand only for some consumers, with heterogeneity in price sensitivity (Connor et al., 1996; Hainmueller et al., 2015). These settings motivate our focus on (i) segmented demand for authenticity and (ii) heterogeneous managerial incentives in oligopoly.

We develop a tractable oligopoly framework in which firms choose prices and costly authenticity effort γ_i, which generates perceived authenticity $b_i(\gamma_i)$. Consumers differ in their valuation of authenticity: a share λ is authenticity-oriented and receives additional utility from perceived authenticity (with intensity $\alpha > 0$), while the remaining consumers are neutral and respond primarily to prices. Crucially, managers may also derive *private* non-pecuniary

[1] For example, engaging in actions viewed as chosen only to manipulate demand or maximize short-run profits.

[2] See, for example, Morhart et al. (2015), Södergren (2021) and Carroll & Kovács (2021).

value from being perceived as intrinsically motivated. We capture these *authenticity-driven motivations* through a firm-specific parameter $\kappa_i \geq 0$ that scales a continuation payoff $R(b_i)$ in the manager's objective. This term is not meant to represent altruism; it summarizes private identity/reputation/career value from being (and being seen as) authentic, and it is naturally stronger when a nontrivial audience attends to authenticity. Consistent with this interpretation, we treat perceived authenticity and its mapping from effort as a reduced form; the paper does not endogenize the full belief-formation process. This is a working paper framework intended to clarify a mechanism rather than to deliver a complete theory of authenticity markets.

The model delivers three main implications. First, heterogeneity in κ_i generates systematic differences in authenticity provision, and (under a standard strategic-complementarity condition between price and perceived authenticity) induces premium positioning: higher-κ firms choose higher authenticity effort and charge (weakly) higher prices. In a unit-demand benchmark, these endogenous differentials generate market segmentation: when authenticity preferences are sufficiently strong, authenticity-oriented consumers sort toward the high-authenticity (high-κ) firm, while neutral consumers tilt toward the lower-price firm.

Second, we study profitability and survival as the size of the authenticity-oriented segment varies. When λ is small, authenticity is weakly monetized, and costly provision is privately unattractive; when λ is large, authenticity is privately sustainable. This generates a natural *fragility* logic: the market viability of authenticity-driven firms is sensitive to the size of the authenticity-oriented segment.

Third, we examine welfare and policy. Welfare is defined as consumer surplus plus profits plus an optional direct social value of authenticity. This leads to three regimes in λ: for low λ, the authenticity-driven firm exits and the market commodifies; for high λ, authenticity is privately viable; and for intermediate λ, a *fragile authenticity* region may arise in which duopoly is socially preferred to monopoly, yet the authenticity-driven firm exits under laissez-faire. In that region, a planner can preserve market structure through non-distortionary participation support, and (in an extension) certification can operate by shifting perceived authenticity rather than subsidizing marginal costs.

The remainder of the paper is structured as follows. We conclude this section with a brief literature review of related studies. Section 2 presents the baseline model, including the definition of authenticity effort, segmented demand, and authenticity-driven managerial motivations. Section 3 characterizes equilibrium conduct under segmented demand, deriving authenticity provision, price ranking, and endogenous market segmentation. Section 4 discusses the viability and profitability of authenticity. Section 5 provides an illustrative Hotelling duopoly example that transparently demonstrates premium positioning, consumer sorting, and the possibility of an authenticity arms race. Section 6 studies welfare, market exit, and policy, identifying the fragile-authenticity region in which laissez-faire exit occurs despite duopoly being welfare-superior, and characterizing non-distortionary participation support and certification. Section 7 discusses empirical interpretations, extensions, and policy implications, including audience formation, belief-based certification, and limitations of the framework. For simplicity, we relegate the proofs of all main results in the Appendix

1.1. ***Related Literature***

Our analysis of authenticity-driven behaviors connects to several strands of economic research on information, identity, intrinsic motivation, and non-price competition.

First, our modeling approach relates to works on credence attributes and market performance under imperfect information. Classic contributions show how unobservable attributes can distort outcomes and how reputational mechanisms can sustain premia for high-attribute products (Akerlof, 1970; Shapiro, 1983). We adopt this perspective but focus on authenticity as a belief-based attribute that is (i) valued only by a subset of consumers and (ii) potentially supported by managers' private motives, which together naturally generate segmented demand and heterogeneous provision rather than uniform "quality upgrading."

Second, the paper is related to the economics of identity and intrinsic motivation. Akerlof & Kranton (2000) and Akerlof & Kranton (2005) emphasize identity as a determinant of preferences and organizational behavior, and Bénabou & Tirole (2003) model how incentives interact with intrinsic motivation, reputational concerns, and social image. Related work studies motivated agents and mission alignment in organizations; see, e.g., Besley & Ghatak (2007) and Prendergast (2008). Our contribution differs in emphasis: we embed a reduced-

form authenticity (or identity) payoff directly into an oligopoly pricing environment and study how heterogeneity in such motives maps into equilibrium effort, prices, sorting, and the participation (exit) margin.

Third, the paper contributes to industrial organization (IO) models of non-price competition and differentiation. Classic analyses of quality choice and advertising characterize how firms trade off costs against demand expansion (see e.g., Mussa & Rosen (1978); Dorfman & Steiner (1954); Shaked & Sutton (1982)). Recent work by Berry (1994) and Sutton (1991) highlight how differentiation shapes pricing and market structure. We adapt this logic to authenticity: a costly, belief-based differentiation margin that matters only for part of demand and can be amplified by managers' non-pecuniary motives, yielding premium positioning and a parameter region in which socially valuable differentiation is privately unsustainable.

Finally, the paper relates to models of corporate social responsibility and mission-driven conduct under competition, where consumer preferences and managerial objectives jointly shape outcomes; see, e.g., Baron (2008), Besley & Ghatak (2007), and Aghion et al. (2023). Our analysis complements this work by emphasizing authenticity as a credence or identity attribute and by highlighting a policy logic centered on preserving market structure (via participation support) or improving credibility (via certification) rather than distorting marginal pricing and output incentives.

2. Model

The model features a segmented market in which a fraction of consumers values perceived brand authenticity, while the remaining consumers are authenticity-neutral. Firms simultaneously choose prices and costly authenticity effort, where effort translates into perceived authenticity that shifts demand only among authenticity-oriented consumers. Managers may also derive non-pecuniary utility from being perceived as intrinsically motivated, generating heterogeneity in incentives to invest in authenticity. In equilibrium, firms choose prices and authenticity effort to balance convex effort costs against market-driven demand gains and managerial reputational returns. The resulting Nash equilibrium is characterized by standard pricing conditions and an authenticity condition that decomposes incentives into market

returns and intrinsic managerial motives, providing a transparent link between preference heterogeneity, effort provision, and equilibrium conduct.

2.1. ***The environment***

A unit mass of consumers is a potential buyer of private goods, each of whom receives utility $v > 0$ from consuming one unit of it. Consumers differ in their attitudes towards managerial authenticity in the market. A fraction λ of consumers are *authenticity-oriented* or A-type individuals and value authenticity, and the remaining $1 - \lambda$ do not value authenticity and are referred to as *neutral* or N-types. Let preferences be quasi-linear and authenticity acting as a demand shifter, for $T \in \{A, N\}$:

$$u^T = v - p_i + \alpha^T b_i$$

denotes the utility of a consumer where $\alpha^T \equiv \alpha^A = \alpha > 0$ if the consumer values authenticity, and $\alpha^T \equiv \alpha^N = 0$ if the consumer is neutral towards authenticity, b_i is the perceived authenticity level of the firm (or manager) of good i, charging price p_i for good i. The parameter α therefore represents the intensity of the authenticity valuation for A-type consumers.[3]

We view the consumer's utility as an indirect utility index that summarizes how prices and perceived authenticity affect willingness to pay. Aggregate demands are taken in reduced form but are consistent with standard consumer choice under heterogeneity. Let $Q_i^N(p)$ and $Q_i^A(p, b)$ denote demands from the two segments, with the general downward sloping property with respect to own-price: $\frac{\partial Q_i^T}{\partial p_i} < 0$ for each i and each $T \in \{A, N\}$. Then, total demand is $Q_i(p, b) = (1 - \lambda)Q_i^N(p) + \lambda Q_i^A(p, b)$. We do not commit to a specific discrete-choice or horizontal-differentiation micro-foundation in the baseline model. Instead, we take the segment demands $Q_i^N(p)$ and $Q_i^A(p, b)$ as reduced-form objects induced by standard consumer choice with heterogeneity.

[3] Besley & Ghatak (2007) use a similar representation of consumers' preferences, u^T, when investigating the feasibility and desirability of corporate social responsibility (CSR) in competitive markets.

Assumption 1 (A1) *Authenticity affects A-type consumers:*

$$\frac{\partial Q_i^N}{\partial b_j} = 0 \text{ for all } i, j, \text{ and } \frac{\partial Q_i^A}{\partial b_i} > 0 \text{ for all } i.$$

Assumption 1 states that authenticity is a firm-specific credence attribute that affects demand only for authenticity-oriented consumers. The perceived authenticity b_i enters the demand of each A-type consumer as a single scalar shifter, while it has no direct effect on the demand of each neutral consumer.

We consider an industry with S firms indexed by $i \in \{1, \ldots, S\}$. Each firm chooses a price p_i and an authenticity effort level $\gamma_i \geq 0$. Authenticity effort maps into a publicly perceived authenticity index $b_i \equiv b_i(\gamma_i)$, where $b_i'(\gamma_i) > 0$ and $b_i''(\gamma_i) \leq 0$, capturing diminishing returns to authenticity investments. Indeed, Verhaal & Dobrev (2022) provide some empirical evidence that perceived brand authenticity exhibits diminishing marginal returns. Let $b \equiv b(\gamma) = (b_1(\gamma_1), \ldots, b_S(\gamma_S))$ denote the perceived authenticity profile. Firm i's monetary profit is given by

$$\pi_i(p, \gamma) = p_i Q_i(p, b) - C_i(Q_i(p, b)) - \Gamma_i(\gamma_i),$$

where $Q_i(p, b)$ denotes demand, which depends on prices and perceived authenticity, $C_i(\cdot)$ is an increasing and convex production cost, and $\Gamma_i(\cdot)$ is an increasing and convex cost of authenticity effort. In addition to monetary profits, we allow managers to derive private utility from being *perceived* as authentic or intrinsically motivated. Formally, firm i's manager receives a non-pecuniary payoff $R(b_i)$, with $R'(b_i) > 0$, which captures reputational, identity-based, or career-related benefits associated with authenticity.

This formulation is grounded in previous studies showing that economic agents, including managers, value public beliefs about their intrinsic motivation, mission alignment, or moral character, and are willing to incur real costs to shape such beliefs. Models of identity and image motivation show that individuals derive direct utility from acting consistently with a valued identity and from being *seen* as doing so (Akerlof & Kranton, 2000, 2005; Bénabou & Tirole, 2003, 2006). In corporate settings, this motive manifests through reputational capital in managerial labor markets, mission-driven behavior, and the pursuit of legitimacy

or credibility beyond immediate profit maximization (Besley & Ghatak, 2005; Baron, 2008; Barnea & Rubin, 2010; Besley & Ghatak, 2017). Empirically, managers and founders frequently undertake costly actions, such as mission-preserving governance choices, voluntary over-compliance with standards, or public commitments that restrict future profits, that are difficult to rationalize absent such image- or identity-based payoffs. A prominent example is the case of *Patagonia*, whose founder transferred ownership to a purpose trust and a nonprofit entity in order to entrench environmental objectives (Chouinard, 2022). These actions aimed to preserve perceived authenticity and mission alignment, even at the expense of short-run profits. A related example includes *Ben & Jerry's Homemade Inc.*, which, at the time of its acquisition by *Unilever* in 2000, embedded a legally distinct social-mission board to safeguard brand integrity and mission credibility (Hays, 2000).

We assume that firm owners (or shareholders) are aligned with managerial objectives and therefore abstract from delegation and agency frictions. This assumption is appropriate for founder-led firms, mission-locked ownership structures, cooperatives, or environments in which owners deliberately select managers whose preferences align with the firm's objectives. Examples include the cases of *Patagonia* and *Ben & Jerry's Homemade Inc.* since their creation, and the merger *Unilever-Ben & Jerry's* from 2000 to 2024 (IMAA, 2025). Importantly, this alignment assumption is not essential for the mechanism we study, but it allows us to focus on the interaction between market competition and authenticity-driven incentives.

Only a subset of consumers, precisely, type-A consumers, derive utility from authenticity, and firms may differ in the extent to which their managers internalize the reputational value of being perceived as authentic. We capture this heterogeneity by assigning each firm a parameter $\kappa_i \geq 0$, which measures the weight placed on authenticity-related non-pecuniary payoffs. The vector $\kappa = (\kappa_1, \ldots, \kappa_S)$ therefore summarizes heterogeneity in managerial concern for authenticity across firms. The manager of firm i maximizes

$$M_i(p_i, \gamma_i; \kappa_i) = \pi_i(p, \gamma) + \kappa_i \, \lambda \, R(b_i(\gamma_i)) \,, \tag{1}$$

where $\lambda \geq 0$ scales the importance of the authenticity payoff.[4] The parameter λ captures the extent of audience attention: reputational, career, or identity-based returns to authenticity are realized only to the extent that consumers, media, or other stakeholders observe and care about authenticity claims. Our formulation is consistent with evidence showing that authenticity-driven behavior is stronger in high-visibility environments and weaker when audience attention is limited (e.g., Akerlof & Kranton, 2000, 2005; Bénabou & Tirole, 2006, 2011; Holmström, 1999; Baron, 2001).

In the specification (1), the parameter κ_i does not represent altruism or social preferences. Instead, it captures private utility from being perceived as intrinsically motivated or mission-driven, even when such perceptions are imperfectly monetized or accrue primarily to the manager rather than the firm. The case $\kappa_i = 0$ corresponds to a purely profit-maximizing manager, while higher values of κ_i reflect stronger identity- or reputation-based motivations. For instance, the cases of *Patagonia* and *Ben & Jerry's Homemade Inc.* illustrate that their managers derive private utility from being perceived as intrinsically motivated or mission-driven rather than from altruistic concern for consumers.

2.2. ***Equilibrium***

Firms simultaneously choose the strategy profile (p_i, γ_i), then consumers decide where to buy given prices and perceived authenticity. A (pure-strategy) equilibrium is a Nash equilibrium in firms' price–authenticity strategies. In Appendix A, we provide conditions under which a Nash equilibrium exists.

Conditional on authenticity choices $(\gamma_i)_{i=1}^{S}$, the pricing first-order condition coincides with the standard Lerner rule from profit maximization because the authenticity-motive term does not depend directly on p_i. The manager decides the authenticity effort level by solving

[4] The standard IO benchmark assumes profit maximization. We allow a reduced-form, non-pecuniary payoff from being perceived as intrinsically motivated (identity, reputation, or career concerns). Equivalently, $\kappa_i R(b_i)$ can be interpreted as a static proxy for dynamic gains from building an intangible asset (credibility/brand capital) that are not modelled explicitly.

the first-order condition

$$\Gamma_i'(\gamma_i^*) = \underbrace{(p_i^* - C_i'(Q_i))\,\frac{\partial Q_i}{\partial b_i}\,b_i'(\gamma_i^*)}_{\text{Market Return}} + \underbrace{\kappa_i\,\lambda\,R'(b_i(\gamma_i^*))\,b_i'(\gamma_i^*)}_{\text{Managerial Return}}. \tag{2}$$

Equation (2) decomposes the marginal incentive to invest in authenticity into two components. The first term captures a *market return*: higher authenticity raises demand from authenticity-oriented consumers and thus operating profits. The second term captures a *managerial return*: higher perceived authenticity yields a direct non-pecuniary payoff to the manager, scaled by the strength of authenticity-driven motives κ_i and by the size of the attentive audience λ. Through (2), equilibrium prices vary with κ through the induced change in equilibrium authenticity.

These conditions highlight the central trade-off in the model: authenticity effort balances convex effort costs against market-mediated demand gains and authenticity-driven managerial payoffs. In Section 3, we use this characterization to study how heterogeneity in κ_i shapes equilibrium authenticity provision, pricing, and consumer sorting.

3. Equilibrium conduct with segmented demand

This section develops the first set of implications of our main mechanism: *segmented demand for authenticity* (a share λ of consumers values perceived authenticity) combined with *heterogeneous authenticity-driven managerial motives* (firms differ in κ_i). Throughout, we restrict attention to interior equilibria, for which first-order conditions fully characterize firms' choices and facilitate comparative statics. Formal existence results and the role of interiority are presented in Appendix A.[5]

[5]With interior equilibria, authenticity effort is strictly positive, and demand is differentiable in perceived authenticity. This allows first-order conditions to characterize optimal choices. However, all comparative statics extend to corner solutions (e.g., $\gamma_i = 0$) provided best responses satisfy standard single-crossing and monotonicity conditions.

3.1. ***Authenticity provision and price ranking***

We show that heterogeneity in κ_i generates an endogenous ranking in authenticity provision, and (under a standard complementarity condition) an associated ranking in prices.

Proposition 1 *Assume* ***A1*** *and suppose firms i and j are symmetric in all primitives except for κ, with $\kappa_i > \kappa_j$. Then in any interior equilibrium,*

$$\gamma_i^* > \gamma_j^* \qquad \textit{and hence} \qquad b_i^* > b_j^*.$$

Moreover, if profits exhibit increasing differences in (p_i, b_i) (equivalently, firm i's best-response price is weakly increasing in own perceived authenticity b_i), then

$$p_i^* \geq p_j^*,$$

with strict inequality whenever the increasing-differences condition is strict and $b_i^* > b_j^*$. □

Proposition 1 formalizes a simple force: κ_i acts like a *private subsidy* to authenticity effort. In the authenticity optimality condition (2), a higher κ_i raises the marginal incentive to increase γ_i through the managerial-return term $\kappa_i \lambda R'(b_i) b_i'(\gamma_i)$, leading the high-$\kappa$ firm to choose strictly higher authenticity (and thus higher perceived authenticity). The price implication is indirect. When price and authenticity are strategic complements, i.e., higher perceived authenticity makes a higher price more attractive, the authenticity advantage of the high-κ firm translates into a (weak) price premium. This premium-positioning logic is illustrated transparently in the Hotelling duopoly example in Section 5, where both the equilibrium authenticity differential and the equilibrium price differential are proportional to the authenticity-motive gap $\Delta\kappa$.

3.2. ***Consumer sorting and endogenous market segmentation***

We find that the "premium positioning" in Proposition 1 leads to market segmentation in which authenticity-oriented consumers are willing to pay a price premium for greater authenticity, while neutral consumers tilt toward the cheaper firm. It follows that heterogeneous authenticity-driven motivations generate endogenous market segmentation. Consider

a duopoly with $\kappa_1 > \kappa_2$. By Proposition 1, equilibrium outcomes satisfy $b_1^* > b_2^*$ and, under strategic complementarity, $p_1^* \geq p_2^*$. Neutral consumers (N-types) value only prices and therefore weakly prefer the lower-price firm. Authenticity-oriented consumers (A-types) trade off the equilibrium price premium against the authenticity advantage of firm 1.

Proposition 2 *Consider a duopoly with $\kappa_1 > \kappa_2$. Define the threshold*

$$\bar{\alpha} \equiv \frac{p_1^* - p_2^*}{b_1^* - b_2^*}.$$

If $\alpha > \bar{\alpha}$, equilibrium demand is fully segmented: all authenticity-oriented consumers (A-types) buy from the high-authenticity firm 1, while all neutral consumers (N-types) buy from the low-price firm 2. If $\alpha < \bar{\alpha}$, both consumer types strictly prefer firm 2, and no segmentation arises. □

Proposition 2 shows that segmentation is an *equilibrium outcome*, not an exogenous assumption. Given a fixed audience composition λ, differences in managerial authenticity motives translate into authenticity and price differentials, which induce consumers with heterogeneous preferences to sort across firms. A sharp unit-demand benchmark and the formal derivation are provided in Appendix B.2.

4. Profitability and viability of authenticity

Having characterized equilibrium behavior for a fixed audience composition, we next study how monetary profits vary with the size of the authenticity-oriented segment. The parameter λ scales the market relevance of authenticity by jointly affecting the demand-side return to authenticity and the effective strength of authenticity-driven motives. We clarify when authenticity can be sustained in equilibrium and when it is vulnerable to competitive pressure. Let $x^*(\lambda) = (p^*(\lambda), \gamma^*(\lambda))$ be the equilibrium strategy profile such that $\pi_i^*(\lambda) \equiv \pi_i(x^*(\lambda); \lambda)$ denote equilibrium monetary profits as a function of the share λ of authenticity-oriented consumers. Using the chain rule and first-order conditions, we can write the total derivative

of $\pi_i^*(\lambda)$ with respect to λ as

$$\frac{d\pi_i^*(\lambda)}{d\lambda} = \underbrace{\left(p_i^* - C_i'(Q_i^*)\right) Q_{i,\lambda}(x^*;\lambda)}_{\text{Force I}} + \underbrace{\sum_{j\neq i}\left(\pi_{i,p_j}\frac{dp_j^*}{d\lambda} + \pi_{i,\gamma_j}\frac{d\gamma_j^*}{d\lambda}\right)}_{\text{Force II}} \underbrace{-\kappa_i\,\lambda\,R'(b_i)b_i'(\gamma_i^*)\,\frac{d\gamma_i^*}{d\lambda}}_{\text{Force III}}, \tag{3}$$

where $Q_{i,\lambda} = \frac{\partial Q_i}{\partial \lambda}$, $\pi_{i,p_j} = \frac{\partial \pi_i}{\partial p_j}$, and $\pi_{i,\gamma_j} = \frac{\partial \pi_i}{\partial \gamma_j}$. Equation (3) decomposes the profit effect of λ into three forces described as follows.

1. Force I is the *direct market composition effect*. Since the price markup is positive in an interior equilibrium, this term is positive when A-type consumers disproportionately favor firm i. Indeed, for a segmented demand, $Q_{i,\lambda} = Q_i^A(x^*) - Q_i^N(x^*)$ is positive whenever $Q_i^A(x^*) > Q_i^N(x^*)$.

2. Force II represents the *strategic spillovers*. In differentiated markets, $\pi_{i,p_j} > 0$, so if a higher λ softens competition and raises rival prices, spillovers are positive.

3. Force III represents the *over-investment loss*. When $\kappa_i > 0$ and $d\gamma_i^*/d\lambda > 0$, a larger attentive audience pushes authenticity beyond the monetary-profit optimum.

It follows that a sufficient condition for $d\pi_i^*(\lambda)/d\lambda > 0$ is to have the sum of direct market composition effect and strategic spillovers overcoming the over-investment loss. Conversely, profits decrease in λ when the latter inequality is reversed, illustrating how a larger authenticity-oriented audience can fuel a costly authenticity arms race.

Observation 1 *An increase in λ raises managerial payoffs by enlarging the audience that values authenticity, but its effect on monetary profits is non-monotonic: when λ is small, authenticity effort primarily raises costs and disadvantages high-κ firms, whereas beyond a certain threshold λ^π the expanded demand-side return makes authenticity a profitable and competitively viable strategy.*

5. Illustrative duopoly example

We give a closed-form Hotelling duopoly that makes the mechanism transparent: a segmented audience values authenticity, and heterogeneous intrinsic motives (κ_i) generate endogenous differences in authenticity and (when price and authenticity are complements) a price premium. Full derivations and closed-form levels are in Appendix C.

5.1. ***Environment***

Two firms $i \in \{1, 2\}$ are located at 0 and 1 on a Hotelling line with unit mass of consumers uniformly distributed on $[0, 1]$. A fraction $\lambda \in (0, 1)$ are authenticity-oriented (A-types) and $1 - \lambda$ are neutral (N-types). Transportation cost is $t > 0$. Each firm chooses a price p_i and authenticity effort $\gamma_i \geq 0$. Marginal cost is constant $c \geq 0$, authenticity cost is quadratic, $\Gamma(\gamma_i) = \frac{k}{2}\gamma_i^2$ with $k > 0$. Perceived authenticity is linear, $b_i(\gamma_i) = \gamma_i$, and the managerial payoff is linear in perceived authenticity, so managers maximize $M_i = (p_i - c)Q_i - \frac{k}{2}\gamma_i^2 + \kappa_i\lambda\gamma_i$, where only A-types respond to authenticity.

5.2. ***Demands, equilibrium and authenticity arms race***

The indifferent consumers in the N- and A-segments are $Q^N = \frac{1}{2} + \frac{p_2 - p_1}{2t}$ and $Q^A = Q^N + \frac{\alpha(\gamma_1 - \gamma_2)}{2t}$, respectively. Hence, the total demand for firm 1 is $Q_1 = \lambda Q^A + (1 - \lambda)Q^N$, and firm 2's demand is $Q_2 = 1 - Q_1$. Let $\Delta\gamma \equiv \gamma_1 - \gamma_2$ and $\Delta\kappa \equiv \kappa_1 - \kappa_2$. There is a unique interior equilibrium provided $D \equiv k - \frac{\lambda^2\alpha^2}{3t} > 0$. In that equilibrium, differences in authenticity effort and prices are proportional to $\Delta\kappa$: $\Delta\gamma^* = \frac{\lambda\,\Delta\kappa}{D}$ and $\Delta p^* \equiv p_1^* - p_2^* = \frac{2\lambda^2\alpha\,\Delta\kappa}{3D}$. Thus, if $\kappa_1 > \kappa_2$, firm 1 chooses higher authenticity and (weakly) charges a premium; A-types tilt toward firm 1 while N-types tilt toward the cheaper rival.

When motives are similar (small $\Delta\kappa$), firms can invest substantially in authenticity without generating much price or market-share differentiation, so the extra effort is dissipative mainly in monetary terms. In the symmetric-motive case $\kappa_1 = \kappa_2$, the equilibrium is symmetric in prices and shares but features positive authenticity effort, so stronger intrinsic motives raise effort costs without improving differentiation, potentially eroding monetary profits. The following observation summarizes this illustrative example.

Observation 2 *In a Hotelling duopoly with segmented demand and heterogeneous managerial motives, the firm with stronger authenticity motives chooses higher authenticity and (under complementarity) charges a higher price, inducing sorting of A-types toward the high-authenticity firm. When motives are similar, competition can generate an authenticity arms race: high effort with limited differentiation and compressed monetary profits.*

6. Welfare, market exit, and policy instruments

The previous sections characterize the laissez-faire equilibrium behavior under segmented demand and heterogeneous managerial motives. We now ask whether these market outcomes are socially efficient once we account for the surplus created for authenticity-oriented consumers and (potentially) any direct social value of authenticity.

6.1. ***Laissez-faire versus central planning***

We compare equilibrium authenticity efforts and welfare under laissez-faire market equilibria and a centralized allocation in which a planner chooses prices and authenticity efforts to maximize social welfare. We define welfare as:

$$W(x;\lambda,\theta) = CS(x;\lambda) + \sum_{i\in S}\pi_i(x;\lambda) + \theta\sum_{i\in S} b_i(\gamma_i), \tag{4}$$

where $x = (p,\gamma)$ collects prices and authenticity efforts, λ is the share of authenticity-oriented consumers, $\theta \geq 0$ measures the direct (non-market) social value of authenticity, and CS is the consumer surplus.[6]

Let $x^{LF}(\lambda) \equiv \{p_i^{LF}(\lambda), \gamma_i^{LF}(\lambda)\}_{i\in S}$ denote the laissez-faire equilibrium induced by managerial optimization, and $x^{SP}(\lambda,\theta) \equiv \arg\max_{x\in X} W(x;\lambda,\theta)$ denote the social planner's allocation. We define the equilibrium welfare levels as $W^{LF}(\lambda,\theta) = W(x^{LF}(\lambda);\lambda,\theta)$ and $W^{SP}(\lambda,\theta) = W(x^{SP}(\lambda,\theta);\lambda,\theta)$.

[6]With quasi-linear preferences (as in Section 5), total surplus can be written as consumer surplus plus aggregate profits (net of production and authenticity-effort costs). The term $\theta\sum_i b_i(\gamma_i)$ captures any direct non-market spillover value of authenticity (e.g., cultural, community, or environmental benefits) in reduced form.

6.1.1. *Authenticity efforts under LF and SP regimes*

We recall that the first-order condition with respect to authenticity effort under the laissez-faire (LF) regime is

$$\Gamma_i'(\gamma_i^{LF}) = \underbrace{\big(p_i^{LF} - C_i'(Q_i^{LF})\big)\frac{\partial Q_i}{\partial b_i}\, b_i'(\gamma_i^{LF})}_{\text{market return via profits}} + \underbrace{\kappa_i\, \lambda\, R'(b_i(\gamma_i^{LF}))\, b_i'(\gamma_i^{LF})}_{\text{managerial return}}. \tag{2}$$

Laissez-faire internalizes the effect of authenticity on firm profits and the manager's private reputational payoff, but it does not directly internalize consumer surplus, cross-firm demand spillovers, or the direct social value of authenticity. The social planner (SP) chooses x to maximize $W(x;\lambda,\theta)$. Then, differentiating welfare with respect to p_i yields

$$\frac{\partial W}{\partial p_i} = \frac{\partial CS}{\partial p_i} + \sum_{j\in S}\frac{\partial \pi_j}{\partial p_i} = -Q_i + \sum_{j\in S}\pi_{j,p_i} = 0. \tag{5}$$

Thus, relative to laissez-faire, the planner internalizes deadweight losses from pricing and typically chooses lower prices. We obtain the planner's authenticity condition by differentiating welfare with respect to γ_i, and obtain

$$\Gamma_i'(\gamma_i^{SP}) = \underbrace{\frac{\partial CS}{\partial \gamma_i}}_{\text{consumer-surplus externality}} + \underbrace{\sum_{j\in S}(p_j - C_j'(Q_j))\frac{\partial Q_j}{\partial \gamma_i}}_{\text{profit spillovers}} + \underbrace{\theta\, b_i'(\gamma_i^{SP})}_{\text{direct social value}}. \tag{6}$$

Let $\Delta_i(\gamma;x) := \Gamma_i'(\gamma_i^{SP}) - \Gamma_i'(\gamma_i^{LF})$ be the marginal "wedge" between the planner and laissez-faire. Thus, Δ_i compares the planner's extra marginal benefits from authenticity (consumer surplus, spillovers, and direct value) to the manager's private reputational return. Assume Γ_i is strictly convex so that Γ_i' is strictly increasing, and assume an interior solution in each regime, the sign of Δ_i provides a ranking of γ_i^{SP} versus γ_i^{LF}. We can write Δ_i as

$$\begin{aligned}\Delta_i(\gamma;x) = &\underbrace{\frac{\partial CS}{\partial \gamma_i}}_{\text{CS externality}} + \underbrace{\sum_{j\neq i}(p_j - C_j'(Q_j))\frac{\partial Q_j}{\partial \gamma_i}}_{\text{cross-firm spillovers}} \\ &+ \underbrace{\theta\, b_i'(\gamma_i)}_{\text{direct social value}} - \underbrace{\kappa_i\, \lambda\, R'(b_i) b_i'(\gamma_i)}_{\text{private reputational motive}}.\end{aligned} \tag{7}$$

Evaluating (2) and (6), we note two polar cases. First, if authenticity generates substantial consumer surplus that is weakly monetized (large $\partial CS/\partial\gamma_i$) or has direct social value ($\theta > 0$), while private reputational motives are modest (small κ_i), then $\Delta_i > 0$ and $\gamma_i^{SP} > \gamma_i^{LF}$ leading to the underprovision of authenticity effort under laissez-faire. Second, if authenticity is positional mainly so that the consumer-surplus term is small at the margin and cross-firm spillovers are weak, while $\kappa_i \lambda R'(b_i) b_i'$ is large, then $\Delta_i < 0$ and laissez-faire yields an authenticity arms race with $\gamma_i^{LF} > \gamma_i^{SP}$. In this case, laissez-faire authenticity effort dominates the social one.

Observation 3 *The planner increases authenticity effort above laissez-faire when authenticity creates an uninternalized surplus for consumers or society, and reduces authenticity below laissez-faire when managerial reputational incentives induce dissipative over-investment.*

6.1.2. ***Welfare under LF and SP regimes***

We define the welfare gap as $\Delta W(\lambda, \theta) \equiv W^{SP}(\lambda, \theta) - W^{LF}(\lambda, \theta)$. By definition, $\Delta W(\lambda, \theta) \geq 0$, with equality only if the laissez-faire allocation coincides with the planner's solution. We can write the welfare gap as

$$\Delta W(\lambda, \theta) = \underbrace{CS^{SP} - CS^{LF}}_{\text{consumer-surplus correction}} + \underbrace{\sum_i (\pi_i^{SP} - \pi_i^{LF})}_{\text{pricing and spillover correction}} + \underbrace{\theta \sum_i \left[b_i(\gamma_i^{SP}) - b_i(\gamma_i^{LF}) \right]}_{\text{direct social value}}.$$

The welfare gap reflects pricing distortions from market power, misaligned authenticity provision, and the failure to internalize the social value of authenticity. Laissez-faire coincides with the planner only when these distortions vanish—namely, when prices are efficient and managerial motives align with marginal consumer surplus and social value considerations. Otherwise, authenticity-driven incentives may be privately attractive yet socially inefficient, making centralized intervention welfare-improving.

6.2. ***The Fragile authenticity***

The welfare analysis above shows that inefficiencies may persist even when laissez-faire behavior is locally optimal in prices and authenticity effort. The relevant distortion therefore

operates at the *extensive margin*, i.e., firm participation, rather than through misaligned marginal incentives. We study this distortion by comparing the laissez-faire duopoly to the monopoly that results when the authenticity-driven firm exits.

Let $\pi_1^D(\lambda)$ denote the equilibrium *monetary* profit of the authenticity-driven firm (firm 1, with $\kappa_1 > 0$) under duopoly when the share of authenticity-oriented consumers is λ. Let $W^D(\lambda)$ and $W^M(\lambda)$ denote welfare under duopoly and monopoly, respectively. Firm participation under laissez-faire is governed by profitability, whereas efficiency is evaluated in terms of total surplus, creating the possibility that these criteria diverge as λ varies.

We define two audience-size thresholds. The *private exit threshold* is

$$\lambda_{\text{exit}} \equiv \inf\{\lambda \in [0,1] : \pi_1^D(\lambda) \geq 0\},$$

so that the authenticity-driven firm exits for $\lambda < \lambda_{\text{exit}}$ and remains active otherwise.[7] The *welfare threshold* is defined using the welfare difference $\Delta W(\lambda) \equiv W^D(\lambda) - W^M(\lambda)$, and given by

$$\lambda_W \equiv \inf\{\lambda \in [0,1] : \Delta W(\lambda) \geq 0\}.$$

For all $\lambda > \lambda^W$, duopoly weakly welfare-dominates monopoly. We assume $\Delta W(0) < 0 < \Delta W(1)$, ensuring an interior welfare threshold, and that $\Delta W(\lambda)$ is weakly increasing in λ. *Fragile authenticity* arises when private viability and social desirability diverge. In particular, if $\lambda^W < \lambda^{\text{exit}}$, there exists an intermediate range of audience sizes over which the authenticity-driven firm exits under laissez-faire even though its continued participation in the market raises welfare. The following result formalizes this wedge.

Proposition 3 *Assume $\lambda^W < \lambda^{\text{exit}}$ and define $\Lambda^F \equiv (\lambda^W, \lambda^{\text{exit}})$. Assume, in addition, that $\Delta W(\lambda)$ is weakly increasing in λ.*[8] *Then, for every $\lambda \in \Lambda^F$,*

[7] We model exit as governed by monetary profits because continuation requires meeting a break-even cash-flow/financing condition (e.g., fixed operating costs, creditor constraints, or outside funding). The manager's non-pecuniary payoff from perceived authenticity is not transferable and cannot be used to finance losses, so a firm may exit even if the decision-maker values authenticity.

[8] Equivalently, $\{\lambda : \Delta W(\lambda) \geq 0\} = [\lambda^W, 1]$.

1. *the authenticity-driven firm exits under laissez-faire:* $\pi_1^D(\lambda) < 0$*;*

2. *yet duopoly weakly welfare-dominates monopoly:* $\Delta W(\lambda) \geq 0$*.*

If moreover $\Delta W(\lambda) > 0$ *for all* $\lambda > \lambda^W$ *(e.g., if* ΔW *is strictly increasing on* $(\lambda^W, 1]$*), then* $\Delta W(\lambda) > 0$ *for all* $\lambda \in \Lambda^F$*.* □

The source of the fragility authenticity is an *entry–exit wedge*. Participation decisions in the market depend on private monetary profits, while the planner internalizes the additional surplus generated by the authenticity-driven firm: stronger competition relative to monopoly, higher surplus for authenticity-oriented consumers through increased perceived authenticity b_i, and any direct social value of authenticity. When these welfare gains outweigh the firm's private losses, laissez-faire exit occurs despite duopoly being welfare-superior.

The analysis implies that fragile authenticity reflects an *inherent market-structure inefficiency*, not a failure of marginal pricing or authenticity effort choices. Equilibrium conduct, i.e., prices, authenticity effort, and consumer sorting, is conditionally optimal given participation. Inefficiency arises solely because the authenticity-driven firm does not internalize the surplus it creates for others, rendering authenticity socially valuable yet privately unsustainable over an intermediate range of audience sizes.

6.3. ***Policy implications***

The planner's problem in the fragile-authenticity region (Proposition 3) is not to correct firms' marginal pricing or authenticity choices, but to address a failure of market participation. Because firms base continuation decisions solely on monetary profits, an authenticity-driven firm may exit even when its presence raises total surplus. The planner, therefore, faces a constrained intervention problem, mainly how to sustain the welfare-superior duopoly while preserving equilibrium conduct. This leads naturally to policies that relax the firm's participation constraint without altering its marginal incentives. Proposition 4 formalizes the minimal intervention required to achieve this objective.

Proposition 4 *For any* $\lambda \in \Lambda^F$*, a lump-sum transfer* $T(\lambda)$*, satisfying* $T(\lambda) \geq -\pi_1^D(\lambda)$*, sustains the authenticity-driven firm (or firm 1) participation without changing equilibrium prices or authenticity effort, and yields welfare* $W^D(\lambda)$*.* □

A lump-sum participation transfer is non-distortionary because it relaxes only the *authenticity-driven firm's duopoly participation constraint*, leaving all marginal pricing and authenticity incentives unchanged. Since the transfer is independent of (p_i, γ_i), equilibrium prices, authenticity effort, and consumer sorting coincide with the laissez-faire duopoly outcome. The policy, therefore, prevents inefficient exit by covering a fixed profitability shortfall in the fragile region, without subsidizing output or effort margins. Economically, this is equivalent to a fixed-cost subsidy that preserves the welfare-superior market structure while maintaining equilibrium conduct. The interaction between the exit and welfare thresholds yields three distinct audience-size regimes.

Corollary 1 *Suppose the conditions of Proposition 3 hold. Then the planner's optimal response to the authenticity-driven firm's participation decision depends on the size of the authenticity-oriented audience λ:*

1. ***Low audience share*** *($\lambda < \lambda^W$): Monopoly is welfare-superior, and the planner does not support duopoly participation.*
2. ***Intermediate audience share*** *($\lambda \in \Lambda^F$): Duopoly is welfare-superior but privately unviable. Then, a lump-sum transfer sustaining the authenticity-driven firm's participation is optimal.*
3. ***High audience share*** *($\lambda \geq \lambda^{\text{exit}}$): The authenticity-driven firm is privately viable under duopoly, so no policy support is required.* □

Corollary 1 classifies markets by the size of the attentive audience. When λ is small, authenticity plays a negligible role in demand, and competition collapses toward price-driven outcomes. When λ is large, authenticity is sufficiently rewarded to be privately self-sustaining. The intermediate region is empirically most relevant: authenticity creates substantial welfare gains but fails to satisfy the authenticity-driven firm's participation constraint, making participation-based policies effective.

7. Discussion and extensions

In this section, we discuss and connect the reduced-form primitives of the model to empirically salient authenticity categories and discuss extensions that broaden the interpretation. The discussion clarifies how the same two forces, segmented audiences and heterogeneous authenticity-driven motives, can rationalize observed patterns of premium positioning, sorting, and fragility across markets. We then consider extensions in which authenticity has spillovers, the audience endogenously responds to aggregate authenticity, and certification policies operate through perceived authenticity rather than marginal cost.

7.1. ***Interpretation and empirical implications***

7.1.1. ***Evidence of*** λ ***and*** κ_i

The model is deliberately reduced-form, so it is useful to anchor its two key primitives in settings where (i) *only part of the market* rewards authenticity (segmented demand, captured by λ and α), and (ii) managers sometimes incur real costs to sustain authenticity because they value being (and being seen as) *intrinsically motivated* (captured by $\kappa_i R(b_i)$). Throughout, the mapping is: (i) A-types are the attentive audience of size λ with intensity $\alpha > 0$, (ii) $b_i(\gamma_i)$ is the market's *perceived* authenticity generated by costly effort γ_i, and (iii) κ_i measures how strongly the decision-maker values the continuation payoff from being perceived as authentic by that attentive audience.

(1) Craft and oppositional markets. These markets feature segmented demand in which a subset of consumers acts as an attentive audience that values authenticity as an attribution of intrinsic motivation, identity, or commitment to non-mainstream norms (Carroll & Kovács, 2021), while the remaining consumers are primarily price-oriented or indifferent to such attributes (Carroll & Swaminathan, 2000; Murray & O'Mahony, 2010). Authenticity is inferred from costly, often scale-constraining actions, such as production methods, sourcing choices, or resistance to standardization, that signal commitment beyond instrumental profit maximization, making growth and commercial success potentially detrimental to perceived genuineness, the phenomenon known as the "authenticity paradox" (Schilke, 2014; Kieran et al., 2019; Kovács et al., 2017; Verhaal & Dobrev, 2022). In our framework, the attentive audience share corresponds to λ, identity-preserving actions map into authenticity effort

γ_i, audience inferences into perceived authenticity $b_i(\gamma_i)$, and heterogeneity in managers' willingness to bear these costs for reputational or identity-based reasons is captured by κ_i.

(2) Product-oriented versus customer-oriented brands. In the marketing literature, brand authenticity is often defined by consumers' perceptions that managers are *intrinsically motivated*, i.e., they are genuinely devoted to the product or mission, rather than primarily driven by short-run commercial incentives (e.g., Napoli et al. (2014), Morhart et al. (2015)). This interpretation aligns directly with the model's non-pecuniary payoff channel: managers may derive private utility from being recognized as intrinsically motivated, even when such perceptions are only imperfectly capitalized into demand. Costly but devotion-signaling choices map into authenticity effort γ_i, while heterogeneity in the private value of being perceived as genuinely product-oriented is captured by κ_i.

(3) Mission and stewardship markets: ethical and sustainable foods. Ethically differentiated food markets exhibit segmented demand in which a subset of consumers is willing to pay for credible mission compliance, such as animal welfare, fair trade, or environmentally sustainable practices, while other consumers treat products as close substitutes and remain primarily price sensitive (e.g., Bénabou & Tirole (2006); Kitzmueller & Shimshack (2012)). This corresponds to an authenticity-oriented segment of size λ with valuation $\alpha > 0$. In these markets, producers often differ in stewardship motives: founders and managers may value mission alignment and recognition for mission-consistent conduct even when these attributes are imperfectly monetized. In the model, mission-preserving actions (e.g., audits, process constraints, sourcing choices) enter as costly effort γ_i, their credibility as perceived authenticity $b_i(\gamma_i)$, and heterogeneity in intrinsic mission commitment as κ_i.

(4) Provenance and community-legitimacy markets. In provenance-embedded markets, such as geographic indications, heritage goods, or culturally legitimate production, authenticity is primarily about rightful identity and community embeddedness rather than functional quality (e.g., Suchman (1995); Carroll & Kovács (2021)). A subset of consumers derives additional utility from purchasing from producers perceived as legitimately tied to a place, tradition, or community (an A-segment), while others remain largely price-oriented (an N-segment) (e.g., Suchman (1995); Kovács et al. (2014)). On the supply side, producers

differ in identity- and legitimacy-based motives. For instance, insiders may value authenticity as part of self-identity and collective recognition, whereas outside entrants treat provenance more instrumentally. In the model, community-anchoring actions (heritage methods, local sourcing, institutional compliance) enter as costly effort γ_i, consumer inferences as perceived authenticity $b_i(\gamma_i)$, and heterogeneity in legitimacy-driven motivations as κ_i.

Across these settings, two robust empirical regularities motivate the model's structure. First, authenticity is valued by only a subset of consumers, making segmented demand, captured in our framework by λ and α, a first-order feature of competition. Second, authenticity attributions rest on perceived intrinsic motivation, generating heterogeneity in managers' private willingness to incur authenticity costs, summarized by κ_i and $R(\cdot)$. These features justify modeling authenticity as a belief-based dimension of differentiation and allowing managers to derive direct utility from authenticity, rather than treating it as an objectively verifiable quality or reducing behavior to pure profit maximization.

7.1.2. ***Empirical patterns and testable predictions***

The model delivers testable implications arising from the interaction of segmented demand, costly authenticity provision, and heterogeneous managerial motives, offering guidance for empirical work using prices, consumer purchase behavior, and entry–exit patterns in markets where authenticity is a significant competitive dimension.

Authenticity, pricing, and premium positioning. Our results suggest that firms with stronger authenticity-driven managerial motives invest more in authenticity effort, leading to higher perceived authenticity. When price and authenticity are strategic complements, this authenticity advantage translates into premium positioning: more authentic firms optimally charge higher prices in equilibrium. Empirically, the model predicts a positive association between perceived authenticity and prices in markets where authenticity meaningfully shifts demand, but little or no price effect where authenticity has negligible impact on demand elasticities.

Sorting and market segmentation. Our findings also reveal that differences in authenticity and prices generate endogenous consumer sorting. Authenticity-oriented consumers

gravitate toward high-authenticity firms, while price-oriented consumers favor lower-price rivals. As the valuation of authenticity rises, sorting intensifies and demand may become fully segmented, implying higher willingness to pay and lower price sensitivity among authenticity-sensitive consumers, and the opposite pattern among price-oriented buyers.

Viability and exit as audience size varies. The size of the authenticity-oriented audience jointly determines the market return to authenticity and the effective strength of authenticity-driven managerial motives. When this audience is small, authenticity effort mainly raises costs and may render authenticity-driven firms unprofitable; as it expands, authenticity becomes privately viable. This generates non-monotonic survival patterns, with exit most likely in markets where authenticity is valued by some consumers but not widely enough to sustain costly provision.

Authenticity arms races. When firms have similar authenticity-driven motives, competition can trigger an authenticity arms race: firms invest heavily in authenticity effort without generating meaningful differentiation in prices or market shares. As a result, elevated authenticity may coexist with compressed monetary profits. Our model therefore predicts that markets with strong authenticity norms but limited scope for differentiation will exhibit high authenticity investment alongside thin margins.

Market structure and welfare. Firm participation decisions are governed by monetary profitability, so an authenticity-driven firm may exit even when its presence increases consumer surplus and total welfare. As a result, markets can converge toward price-based competition despite persistent demand for authenticity, particularly when authenticity is valued by a substantial but non-dominant consumer segment.

7.2. ***Certification as an alternative policy instrument***

In the fragile-authenticity region, the distortion is purely *extensive-margin*: the authenticity-driven firm exits even though it generates positive total surplus. Since equilibrium pricing and authenticity effort are efficient conditional on participation, the policy should correct the market structure rather than conduct. A lump-sum participation transfer relaxes the participation constraint and sustains duopoly without altering equilibrium behavior, provid-

ing the benchmark *non-distortionary* intervention. Certification is a distinct alternative: by raising perceived authenticity, it increases the demand-side return to effort and can restore private viability, but only by shifting beliefs and, therefore, typically changing equilibrium conduct; see, e.g., Laffont & Tirole (1993) and Carroll & Kovács (2021).

Given that authenticity is a credence and identity attribute (see, e.g., Darby & Karni (1973)), a natural class of interventions operates through *information* rather than marginal cost wedges. We model *certification* as a third-party signal that increases the credibility of authenticity, raising perceived authenticity for a given effort according to

$$b_i \;=\; \tilde{b}_i(\gamma_i) \;+\; \sigma \cdot \mathbb{1}\{i \text{ certified}\},\; \sigma \geq 0, \tag{8}$$

where $\tilde{b}_i'(\gamma_i) > 0$ and $\tilde{b}_i''(\gamma_i) \leq 0$. The parameter σ represents the *credibility premium* conferred by certification: it is the additive increase in perceived authenticity that a firm receives from being certified, holding its authenticity effort γ_i fixed. Equivalently, σ captures the effectiveness of the third-party certifier in shifting consumer beliefs about authenticity (Carroll & Kovács, 2021), independently of the firm's underlying conduct or costs. Certification affects beliefs, but not production or effort costs (see, e.g., Grossman (1981) and Milgrom & Roberts (1986)), and shifting b_i generally alters demand and equilibrium behavior. We therefore interpret certification as an *information policy* that restores viability by changing beliefs and incentives (see, e.g., Glaeser & Shleifer (2003) and Dranove & Jin (2010)), rather than by relaxing the participation constraint while holding conduct fixed.

7.2.1. ***Viability under certification and exogenous audience composition***

With an exogenous audience share λ, certification can prevent inefficient exit by increasing the demand-side return to authenticity (see, e.g., Shapiro (1983), Lizzeri (1999), and Carroll & Kovács (2021)). Let $\pi_1^D(\lambda, \sigma)$ denote firm 1's equilibrium duopoly profit when certified with strength σ. Under mild monotonicity, certification induces a well-defined survival threshold.

Proposition 5 *Let $\lambda \in (0,1)$ and suppose $\pi_1^D(\lambda, \sigma)$ is continuous and strictly increasing in σ, with $\pi_1^D(\lambda, 0) < 0$ and $\lim_{\sigma\to\infty} \pi_1^D(\lambda, \sigma) > 0$. Then, there exists a unique threshold $\sigma^{\text{cert}}(\lambda) > 0$ such that $\pi_1^D(\lambda, \sigma) < 0$ for $\sigma < \sigma^{\text{cert}}(\lambda)$, and $\pi_1^D(\lambda, \sigma) \geq 0$ for $\sigma \geq \sigma^{\text{cert}}(\lambda)$.* □

We note that Proposition 5 complements Proposition 4. Lump-sum support preserves participation while holding equilibrium conduct fixed, whereas certification, when effective, sustains participation by shifting beliefs and thereby altering equilibrium behavior.

7.2.2. Certification as a coordination device under endogenous audience formation

In some markets, the attentive share of authenticity-oriented consumers responds endogenously to aggregate perceived authenticity, as higher market-wide quality or credibility can expand consumer attention to such attributes (Shaked & Sutton, 1987; Bénabou & Tirole, 2011). A reduced-form representation captures this feedback as

$$\lambda = \Lambda(B),\ B = \sum_{j \in S} b_j,\ \Lambda'(B) \geq 0,$$

where B indexes aggregate perceived authenticity. In this environment, certification plays a dual role. Beyond raising a firm's perceived authenticity via (8), it increases B and thus λ, amplifying both the demand-side return to authenticity and the effective salience of managerial returns through $\kappa_i \lambda R(b_i)$. This feedback can generate coordination effects: a sufficiently strong (possibly temporary) certification shock may tip the market from a low- to a high-authenticity regime (see, e.g., Banerjee (1992)). We treat this channel as an extension and do not formally characterize the resulting multiplicity. When audience composition is exogenous, certification functions purely as an information policy (Dranove & Jin, 2010); when attention responds endogenously, it can also operate as a coordination device that renders higher authenticity provision self-sustaining (Banerjee, 1992; Shapiro, 1983).

7.3. ***Limitations and future work***

Our theoretical framework adopts a deliberately reduced-form representation of demand and authenticity. Authenticity enters utility as a credence and identity attribute, and demand is characterized by minimal monotonicity and complementarity conditions rather than a fully specified micro-foundation. This abstraction ensures broad applicability, spanning unit-demand, Hotelling, and discrete-choice settings, but leaves belief formation and updating outside the model. An important extension would endogenize beliefs through learning, reputation, or signaling dynamics, as in classic models of reputation and information disclosure;

see, e.g., Shapiro (1983), Milgrom & Roberts (1986), and Dranove & Jin (2010).

Our model is static and treats authenticity effort as contemporaneous with pricing and participation. In practice, authenticity and credibility evolve gradually and may be costly to rebuild after dilution or exit. Dynamic extensions could study how past authenticity provision shapes future demand, how certification credibility evolves over time, and whether temporary interventions generate persistent effects by stabilizing or expanding the authenticity-oriented audience. Such dynamics naturally connect to work on belief-driven coordination and identity-based feedback effects; see, e.g., Banerjee (1992) and Bénabou & Tirole (2011).

We summarize managerial authenticity-driven motivations by a reduced-form parameter κ_i. While this captures heterogeneity in intrinsic or identity-based motives, it abstracts from delegation, governance, and agency concerns emphasized in organizational and identity-based approaches to the firm (see, e.g., Akerlof & Kranton (2000) and Bénabou & Tirole (2003)). Future work could embed authenticity-driven managers in principal-agent frameworks or study how ownership structure and managerial selection affect the sustainability of authenticity in competitive markets.

Finally, our policy analysis focuses on participation-support and information-based instruments. Other policy domains, ranging from competition policy to public procurement and regulatory standards, may interact with authenticity in richer, institution-specific ways. Studying these interactions would require additional institutional detail but could yield further insights into how perceived authenticity shapes managerial incentives, equilibrium conduct, and welfare.

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Appendix A. Regularity conditions and existence of Nash equilibrium

Firms are managed by decision-makers who simultaneously choose prices and authenticity effort, while consumers subsequently decide which firm to purchase from. Given consumer preferences over prices and perceived authenticity, and given managers' authenticity-driven motives, an equilibrium is a Nash equilibrium in firms' price–authenticity strategies.

Let $X_i = [0, \bar{p}_i] \times [0, \bar{\gamma}_i] \subset \mathbb{R}^2_+$ be the firm i's strategy set, with $\bar{p}_i < \infty$ and $\bar{\gamma}_i < \infty$. A pure strategy for firm i's manager is $x_i = (p_i, \gamma_i) \in X_i$. We denote by $X = \prod_{i=1}^{S} X_i$ the set of pure strategy profiles. For any $i \in S$, and any strategy profile $x = (x_1, \ldots, x_{i-1}, x_i, x_{i+1}, \ldots, x_S) \in X$, we can write $x = (x_i, x_{-i})$, where $x_{-i} = (x_1, \ldots, x_{i-1}, x_{i+1}, \ldots, x_S)$ is the strategy profile of all players except i.

Assumption 2 (A2) *Consider the following regularity conditions.*

(i) *Strategy sets X_i are non-empty, compact, and convex.*

(ii) *$Q_i(\cdot)$ is continuous, differentiable, and bounded.*

(iii) *Costs $C_i(\cdot)$ and $\Gamma_i(\cdot)$ are lower-semicontinuous.*

(iv) *π_i is twice differentiable with a negative definite Hessian matrix.*

(v) *$M_i(\cdot, x_{-i}; \kappa)$ is strictly concave in x_i over X_i.*

We denote by $G = \langle S, (X_i)_{i\in S}, (M_i)_{i\in S}\rangle$ the normal-form game with strategy sets and payoff functions as above. Under Assumption (i), each strategy set X_i is non-empty, compact, and convex. Assumptions (ii)–(v) imply that M_i is continuous on X and twice continuously differentiable and strictly concave in x_i on X_i for each fixed x_{-i}. Hence, each best-response correspondence

$$B_i(x_{-i}) := \arg\max_{x_i\in X_i} M_i(x_i, x_{-i}; \kappa)$$

is non-empty, convex-valued, and upper hemicontinuous. The joint best-response correspondence $B(x) = \prod_{i\in S} B_i(x_{-i})$ therefore maps the non-empty, compact, convex set X into itself and has a closed graph. By Kakutani's fixed point theorem, B has a fixed point $x^* \in X$, which is a pure-strategy Nash equilibrium of G. An equilibrium is a profile of strategies $x^* = \{(p_j^*, \gamma_j^*)\}$ such that, for each $j = 1, \cdots S$,

$$(p_j^*, \gamma_j^*) \in \arg\max_{(p_j,\gamma_j)} \left\{\pi_j\big(\{(p_s^*, \gamma_s^*)\}_{s\neq j}, (p_j, \gamma_j)\big) + \kappa_j \lambda R\big(b_j(\gamma_j)\big)\right\},$$

taking as given consumers' shopping behavior induced by prices and perceived authenticity, as well as rival firms' strategies.

Appendix B. Proofs of main results

Appendix B.1. ***Proof of Proposition 1***

Fix any firm i and hold fixed rivals' strategies $x_{-i} = (p_{-i}, \gamma_{-i})$. Let the manager of firm i choose (p_i, γ_i) to maximize

$$M_i(p_i, \gamma_i; x_{-i}, \kappa_i) = \pi_i(p, \gamma) + \kappa_i \lambda R\big(b_i(\gamma_i)\big),$$

where $b_i'(\gamma_i) > 0$ and $R'(b) > 0$. Throughout, we consider an *interior* equilibrium.

First, we show that the authenticity effort is increasing in κ_i. For fixed (p, γ_{-i}), define the reduced problem in γ_i: $U_i(\gamma_i; \kappa_i) \equiv M_i(p_i, \gamma_i; x_{-i}, \kappa_i)$, holding p_i fixed. By assumption, $U_i(\cdot; \kappa_i)$ is strictly concave in γ_i, hence any interior maximizer $\gamma_i^*(\kappa_i)$ is unique and satisfies the first-order condition $F_i(\gamma_i, \kappa_i) := (p_i - C_i')Q_{i,b_i}b_i' + \kappa_i\lambda R'(b_i)b_i' - \Gamma_i'(\gamma_i) = 0$. Applying the

Implicit Function Theorem at $(\gamma_i^*(\kappa_i), \kappa_i)$ yields

$$(\gamma_i^*)'(\kappa_i) \equiv \frac{d\gamma_i^*(\kappa_i)}{d\kappa_i} = -\frac{F_{i,\kappa}(\gamma_i^*, \kappa_i)}{F_{i,\gamma}(\gamma_i^*, \kappa_i)}.$$

Because F_i is the derivative of U_i with respect to γ_i, we have $F_{i,\gamma}(\gamma_i^*, \kappa_i) = \partial^2 U_i / \partial \gamma_i^2 < 0$ by strict concavity. Moreover, $F_{i,\kappa}(\gamma_i, \kappa_i) = \lambda R'(b_i(\gamma_i))\, b_i'(\gamma_i) > 0$, since $\lambda > 0$, $R'(b) > 0$, and $b_i'(\gamma_i) > 0$. Therefore, $(\gamma_i^*)'(\kappa_i) > 0$, implying that holding x_{-i} fixed, the authenticity best response is strictly increasing in κ_i.

Second, we order equilibrium authenticity under symmetry. Suppose firms are symmetric in all primitives except for κ and consider two firms i and j with $\kappa_i > \kappa_j$. Symmetry implies that, for any fixed profile of rivals' strategies, firms i and j face the same best-response mapping in γ up to the parameter κ. Since the best response in γ is strictly increasing in κ, any interior equilibrium must satisfy $\gamma_i^* > \gamma_j^*$, and therefore $b_i^* > b_j^*$ since $b_i(\cdot)$ is strictly increasing in γ_i.

Third, we order equilibrium prices. Pricing is weakly increasing in the firm's own authenticity. Indeed, fix x_{-i} and consider firm i's choice of p_i. The authenticity-driven term $\kappa_i \lambda R(b_i(\gamma_i))$ does not depend on p_i, so the optimal price solves the standard profit maximization problem given (γ_i, γ_{-i}): $p_i^*(b) \in \arg\max_{p_i} \ \pi_i(p_i, p_{-i}; b_i, b_{-i})$. Assume that π_i is (weakly) supermodular in (p_i, b_i), i.e., $\frac{\partial^2 \pi_i}{\partial p_i \, \partial b_i} \geq 0$, so that higher perceived authenticity raises the marginal profitability of a higher price. By Topkis' monotonicity theorem (Topkis, 1979), it follows that the (maximal) best response in price is weakly increasing in b_i. With $b_i^* > b_j^*$ and the symmetry of primitives across firms (other than κ), it holds that $p_i^* \equiv p_i^*(b_i^*, b_{-i}) \geq p_i^*(b_j^*, b_{-i}) \equiv p_j^*$. Moreover, if $\partial Q_i / \partial b_i > 0$ (so authenticity strictly shifts residual demand), then $\partial^2 \pi_i / (\partial p_i \, \partial b_i) > 0$ generically, which makes the price best response *strictly* increasing in b_i; hence $p_i^* > p_j^*$.

Appendix B.2. ***Proof of Proposition 2***

Consider a duopoly equilibrium with $b_1^* > b_2^*$ and $p_1^* > p_2^*$. An authenticity-oriented consumer (A-type) obtains utility $u_i^A = v - p_i^* + \alpha b_i^*$. Hence, $u_1^A - u_2^A = -\big(p_1^* - p_2^*\big) + \alpha\big(b_1^* - b_2^*\big)$. Define

the threshold

$$\bar{\alpha} \equiv \frac{p_1^* - p_2^*}{b_1^* - b_2^*}.$$

If $\alpha > \bar{\alpha}$, then $u_1^A > u_2^A$, so all A-types strictly prefer firm 1. Alternatively, $\alpha < \bar{\alpha}$, and $u_1^A < u_2^A$, so that all A-types strictly prefer firm 2. Neutral consumers (N-types) obtain utility $u_i^N = v - p_i^*$ and therefore strictly prefer the lower-priced firm, firm 2. It follows that when $\alpha > \bar{\alpha}$, equilibrium demand is fully segmented, with all A-types buying from firm 1 and all N-types buying from firm 2. When $\alpha < \bar{\alpha}$, both consumer types strictly prefer firm 2, and no segmentation arises.

Appendix B.3. ***Proof of Proposition 3***

Fix any $\lambda \in \Lambda^F = (\lambda^W, \lambda^{\text{exit}})$. The argument proceeds in two parts.

1. First, we show that firm 1 exits under laissez-faire. Let $A \equiv \left\{\tilde{\lambda} \in [0,1] : \pi_1^D(\tilde{\lambda}) \geq 0\right\}$. We recall that $\lambda^{\text{exit}} = \inf A$. By the definition of infimum as a greatest lower bound, no element of A can lie strictly below $\inf A$. Since $\lambda \in \Lambda^F$, it holds $\lambda \notin A$ and $\pi_1^D(\lambda) < 0$. Hence, firm 1 is privately unprofitable under the duopoly and therefore exits under laissez-faire when $\lambda < \lambda^{\text{exit}}$.

2. Second, we compare welfare under duopoly and monopoly. Let $B \equiv \{\tilde{\lambda} \in [0,1] : \Delta W(\tilde{\lambda}) \geq 0\}$ and recall $\lambda^W = \inf B$. Since ΔW is continuous, B is closed and thus $\Delta W(\lambda^W) \geq 0$. Under the assumption that $\Delta W(\lambda)$ is weakly increasing in λ, for any $\lambda > \lambda^W$ we have $\Delta W(\lambda) \geq \Delta W(\lambda^W) \geq 0$. Since $\lambda \in \Lambda^F$ implies $\lambda > \lambda^W$, it follows that $\Delta W(\lambda) \geq 0$ for all $\lambda \in \Lambda^F$. If $\Delta W(\lambda) > 0$ for all $\lambda > \lambda^W$, then $\Delta W(\lambda) > 0$ on the interval Λ^F.

Appendix B.4. ***Proof of Proposition 4***

Fix any $\lambda \in \Lambda^F$. By Proposition 3, $\pi_1^D(\lambda) < 0$ and $\Delta W(\lambda) = W^D(\lambda) - W^M(\lambda) \geq 0$. Consider a policy that offers firm 1 a lump-sum transfer $T(\lambda)$ conditional only on participation, with $T(\lambda) \geq -\pi_1^D(\lambda)$, and independent of (p, γ). Conditional on participation, firm 1's objective in the duopoly subgame becomes

$$\pi_1(p, \gamma) + T(\lambda) + \kappa_1 \lambda R\big(b_1(\gamma_1)\big),$$

which differs from the laissez-faire objective by the constant $T(\lambda)$. Hence $T(\lambda)$ does not enter any first-order condition in (p, γ), so the equilibrium conduct in the active-firms duopoly remains $(p^D(\lambda), \gamma^D(\lambda))$. Firm 1's post-transfer monetary profit is $\pi_1^D(\lambda) + T(\lambda) \geq 0$, so the participation constraint is satisfied (strictly if $T(\lambda) > -\pi_1^D(\lambda)$). The welfare under the policy equals duopoly welfare because the transfer is a pure redistribution:

$$W^T(\lambda) = CS^D(\lambda) + \big(\pi_1^D(\lambda) + T(\lambda)\big) + \pi_2^D(\lambda) + \theta \sum_{i \in \{1,2\}} b_i\big(\gamma_i^D(\lambda)\big) - T(\lambda) = W^D(\lambda).$$

Since $\Delta W(\lambda) \geq 0$ for $\lambda \in \Lambda^F$, it follows that $W^T(\lambda) = W^D(\lambda) \geq W^M(\lambda)$, with a strict inequality if $\Delta W(\lambda) > 0$.

Appendix B.5. ***Proof of Corollary 1***

Assume $\lambda^W < \lambda^{\text{exit}}$.

(i) If $\lambda < \lambda^W$, then by the definition of λ^W and single-crossing, $\Delta W(\lambda) < 0$, so $W^M(\lambda) > W^D(\lambda)$. Since $\lambda < \lambda^{\text{exit}}$ as well, firm 1 is privately unviable under duopoly and exits under laissez-faire; there is no welfare case for a participation subsidy.

(ii) If $\lambda \in \Lambda^F = (\lambda^W, \lambda^{\text{exit}})$, then $\pi_1^D(\lambda) < 0$ (so firm 1 exits) and $\Delta W(\lambda) \geq 0$ (so duopoly is socially preferred). Proposition 4 implies that a participation-contingent lump-sum transfer sustains duopoly without changing conduct.

(iii) If $\lambda \geq \lambda^{\text{exit}}$, then by definition $\pi_1^D(\lambda) \geq 0$, firm 1 is privately viable and survives under laissez-faire. Hence, no participation support is required to prevent exit.

Appendix B.6. ***Proof of Proposition 5***

Fix any $\lambda \in (0, 1)$ and define the function

$$f(\sigma) \equiv \pi_1^D(\lambda, \sigma), \text{ for any } \sigma \geq 0.$$

By assumption, f is continuous and strictly increasing in σ, with $f(0) < 0$ and $\lim_{\sigma \to \infty} f(\sigma) > 0$. Then, there exists $\bar{\sigma} > 0$ such that $f(\bar{\sigma}) > 0$. Continuity of f implies, by the Intermediate Value Theorem, that there exists some $\sigma^* \in (0, \bar{\sigma})$ such that $f(\sigma^*) = 0$, and this value is

unique since f is strictly increasing. Let $\sigma^{\text{cert}}(\lambda)$ denote the unique value satisfying

$$f\big(\sigma^{\text{cert}}(\lambda)\big) = 0.$$

By above analysis, $\sigma^{\text{cert}}(\lambda) \in (0, \bar{\sigma})$, and therefore $\sigma^{\text{cert}}(\lambda) > 0$. Since f is strictly increasing and $f\big(\sigma^{\text{cert}}(\lambda)\big) = 0$, it follows that $f(\sigma) < 0$ for all $\sigma < \sigma^{\text{cert}}(\lambda)$, and $f(\sigma) \geq 0$ for all $\sigma \geq \sigma^{\text{cert}}(\lambda)$. Equivalently, $\pi_1^D(\lambda, \sigma) < 0$ for $\sigma < \sigma^{\text{cert}}(\lambda)$ and $\pi_1^D(\lambda, \sigma) \geq 0$ for $\sigma \geq \sigma^{\text{cert}}(\lambda)$.

Appendix C. Illustrative Hotelling Example in Section 5

This appendix derives the closed-form equilibrium in the Hotelling duopoly used in Section 5.

Set-up and demands. Two firms are located at 0 and 1. Consumers are uniformly distributed on $[0, 1]$. A fraction λ are A-types and value authenticity with intensity $\alpha > 0$; N-types have $\alpha = 0$. Utilities are

$$u_1^T = v - p_1 + \alpha^T \gamma_1 - tl, \qquad u_2^T = v - p_2 + \alpha^T \gamma_2 - t(1 - l), \qquad T \in \{A, N\}.$$

Indifference implies

$$Q^N = \frac{1}{2} + \frac{p_2 - p_1}{2t}, \qquad Q^A = \frac{1}{2} + \frac{p_2 - p_1 + \alpha(\gamma_1 - \gamma_2)}{2t},$$

and total demand is $Q_1 = \lambda Q^A + (1 - \lambda) Q^N$, $Q_2 = 1 - Q_1$, i.e.,

$$Q_1 = \frac{1}{2} + \frac{p_2 - p_1 + \lambda\alpha(\gamma_1 - \gamma_2)}{2t}.$$

Manager objective and first-order conditions. With constant marginal cost c and quadratic authenticity cost $\frac{k}{2}\gamma_i^2$, managers maximize

$$M_i = (p_i - c) Q_i - \frac{k}{2}\gamma_i^2 + \kappa_i \lambda \gamma_i.$$

Interior first-order conditions are

$$Q_i + (p_i - c)\frac{\partial Q_i}{\partial p_i} = 0, \qquad (p_i - c)\frac{\partial Q_i}{\partial \gamma_i} - k\gamma_i + \kappa_i \lambda = 0.$$

Using $\partial Q_1/\partial p_1 = -1/(2t)$ and $\partial Q_1/\partial \gamma_1 = \lambda\alpha/(2t)$ (and symmetrically for firm 2), the system yields a unique interior equilibrium provided

$$D \equiv k - \frac{\lambda^2 \alpha^2}{3t} > 0.$$

Closed-form equilibrium (levels and gaps). Let $\Delta\kappa \equiv \kappa_1 - \kappa_2$. Then the equilibrium price and effort gaps are

$$\Delta\gamma^* \equiv \gamma_1^* - \gamma_2^* = \frac{\lambda\,\Delta\kappa}{D}, \qquad \Delta p^* \equiv p_1^* - p_2^* = \frac{2\lambda^2\alpha\,\Delta\kappa}{3D}.$$

Equilibrium levels can be written compactly using averages:

$$\frac{p_1^* + p_2^*}{2} = c + t, \qquad \frac{\gamma_1^* + \gamma_2^*}{2} = \frac{\lambda(\alpha + \kappa_1 + \kappa_2)}{2k}.$$

Hence

$$p_1^* = c + t + \frac{\alpha\lambda^2\,\Delta\kappa}{3D}, \qquad p_2^* = c + t - \frac{\alpha\lambda^2\,\Delta\kappa}{3D},$$

and

$$\gamma_1^* = \frac{\lambda(\alpha + \kappa_1 + \kappa_2)}{2k} + \frac{\lambda\,\Delta\kappa}{2D}, \qquad \gamma_2^* = \frac{\lambda(\alpha + \kappa_1 + \kappa_2)}{2k} - \frac{\lambda\,\Delta\kappa}{2D}.$$

Market shares are

$$Q_1^* = \frac{1}{2} + \frac{\alpha\lambda^2\,\Delta\kappa}{6tD}, \qquad Q_2^* = \frac{1}{2} - \frac{\alpha\lambda^2\,\Delta\kappa}{6tD}.$$

Symmetric motives and the arms-race benchmark. If $\kappa_1 = \kappa_2 = \kappa$, then $\Delta\kappa = 0$ and the equilibrium is symmetric:

$$p_1^* = p_2^* = c + t, \qquad Q_1^* = Q_2^* = \frac{1}{2}, \qquad \gamma_1^* = \gamma_2^* = \frac{\lambda(\alpha + 2\kappa)}{2k}.$$

In this case, stronger intrinsic motives increase authenticity effort but not differentiation in prices or shares, so monetary profits can fall due to higher effort costs. This is the sense in which competition can produce an "authenticity arms race" when motives are similar. To keep the paper compact, we omit numerical tables. The closed-form expressions above already show the key comparative statics: $\Delta\gamma^*$ and Δp^* scale with λ, α, and $\Delta\kappa$, and the interior condition $D > 0$ identifies when uniqueness and interiority are satisfied.

Declaration of generative AI and AI-assisted technologies in the writing process. During the preparation of this work, the authors used ChatGPT to improve the manuscript's readability. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the final manuscript.