Economic Space Theory

Prize Density, Entry Burden, and Entrepreneurial Search

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409	80	8
posts audited	economics posts read	formal propositions

A formalization of total economic value per real competitor, and of the probability, effort, capital, and search decisions that determine whether a particular entrant can convert that prize into value.

ABSTRACT

The Space Before the Company

Entrepreneurs routinely use market size as a proxy for opportunity, although the same value pool can present radically different prizes depending on who can credibly claim it. Across a 409-post archive, Economic Space Theory developed around a compact idea recorded as **Available Market = Total Market / Competition**. This paper preserves that right-hand side and supplies the economic structure around it. For a bounded entrepreneurial space *s*, gross prize density is $G_s = V_s/N_s$, where V_s is the discounted producer value available for capture and N_s is the post-entry count of serious claimants in the symmetric benchmark. Under ex ante exchangeability and exhaustive allocation, *V/N* is the expected gross capture of each claimant even when realized rewards are winner-take-most. Without symmetry, value and headcount alone are insufficient; competitor seriousness must be normalized into common-pool shares or capture must be modeled.

The entrant-specific layer is separate. If p_{is} is the probability that entrant *i* becomes operationally viable under a resource plan, and R_{is} is its full discounted resource exposure, the compact mean-independent benchmark gives expected net present value $pV/N^{eff}_{is} - R$. A benefit-cost index divides the probability-adjusted prize by *R*. This separation prevents competition from being counted twice and avoids multiplying hours by dollars. The paper derives a symmetry result, an identification failure, a competitor-weight representation, an entry threshold, a niche-partition result, density and free-entry dynamics, and a private-social value wedge. It also provides a worked calculation, a winner-take-most stress test, and a preregisterable measurement protocol. The arithmetic is elementary; the contribution is the integrated, entrant-relative framework and its empirical program.

$$G_s = V_s / N_s$$

$$ENPV_{is} = p_{is} V_s / N^{eff}_{is} - R_{is}$$

$$I_{is} = p_{is} V_s / (N^{eff}_{is} R_{is})$$

space prize, entrant value, and resource-efficiency index

Claim boundary
Economic Space Theory is presented as a decomposition and operational vocabulary, not as a new law of expected value. Equal division, contest success functions, free-entry compression, and business-stealing wedges all have established antecedents. The proposed contribution is their separation into a testable space layer, entrant layer, and dynamic feedback layer.

Keywords: entrepreneurial opportunity; market entry; competition; contestable value; effective competitors; founder search; entry barriers; uncertainty

JEL: L11, L26, D81, M13

CONTENTS

Road Map

CORE NOTATION

Symbol	Meaning	Unit / range
s	An economic space fixed by paid outcome, buyer, geography, channel, rules, and horizon	definition
V_s	Decision-date present value of the contestable producer contribution pool	currency PV
N_s	Post-entry serious-claimant count in the symmetric benchmark	at least 1
G_s	Gross prize density V_s/N_s	currency PV
p_is(x)	Probability entrant i reaches a specified operational threshold under plan x	0 to 1
a_js, b_js	Ex-ante space strength and its common relevance-adjusted contest weight	positive
theta_is	Conditional predicted share of V_s	0 to 1
N_eff,is	Entrant-relative effective competitors, 1/theta_is	at least 1
R_is(x)	Expected discounted cash and opportunity-cost exposure net of salvage	currency PV
ENPV_is	Probability-adjusted gross capture less resource exposure	currency PV
I_is	Probability-adjusted gross capture divided by resource exposure	dimensionless

All quantities are indexed by a decision date and fixed horizon even when those subscripts are suppressed. The focal entrant is included in the denominator. An apparently empty space therefore has $N = 1$ after contemplated entry, never zero.

1. Market Size Is Not Opportunity

A large prize can be a bad arena. A small arena can be a good prize.

Entrepreneurial analysis often begins with a total addressable market. That number answers an important question - how much spending or margin may exist - but not the decision question facing a founder. A value pool of 100 million dollars contested by one serious claimant is not the same economic object as the same pool contested by fifty serious claimants. Nor does either space have the same value for a founder with the relevant skills, runway, and distribution as for one without them. The object of choice is not merely a market and not merely a founder. It is an entrant-space pair.

Economic Space Theory begins one level earlier than company strategy: choose the arena in which strategy will operate. The archive behind this paper repeatedly returned to that choice. *Andrew Tate and Exceptionalism* distinguished global contests from local niches and emphasized unequal prizes. *Economic Spaces* connected the opening of spaces and access rights to dignity. *On Production* separated the space of making from the more heavily contested space of sale. *The Global Religion* put probability, acquisition cost, development cost, time, and foregone salary into the entrepreneurial calculation. *Money 2* then stated the mnemonic in its most compact form: **AM = TM / C**. Later essays introduced finite search, endogenous crowding, scarce recommendation pages, and cost shocks from artificial intelligence.

> **Archive versus evidence**
> The archive establishes intellectual genealogy. It is not empirical validation. The propositions below are evaluated against industrial organization, contest theory, entrepreneurial finance, and uncertainty; the framework remains a research hypothesis until tested on complete, ex-ante cohorts.

1.1 The fixed heart and the derived entrant layer

The paper holds one intuition fixed: the gross prize offered by a space depends positively on its total capturable value and negatively on the serious competition for that value. Probability, effort, and capital are then derived around that object rather than forced into it. This yields three different answers to three different questions.

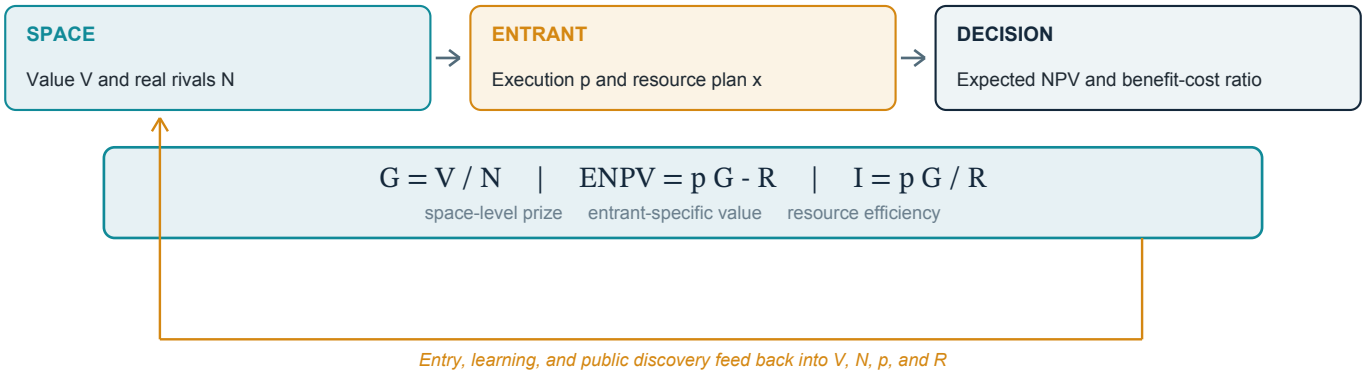

Figure 1. Economic Space Theory separates what the space offers from what a particular entrant can convert, while allowing entry and learning to change the space over time.

- **Gross prize density G = V/N:** What does the space offer per serious claimant under the specified competition model?
- **Expected net present value ENPV = pG - R:** How much expected economic value does this entrant create after full resource exposure?
- **Resource-efficiency index I = pG/R:** How much probability-adjusted gross capture is forecast per unit of resource exposure?

The distinction matters. A high ratio can favor a tiny project with little absolute value, while expected NPV can favor a larger project with a lower ratio. Positive expected dollars can also be unattractive to a liquidity-constrained or risk-averse founder. The framework therefore reports both ENPV and the benefit-cost index rather than asking one scalar to do every job.

1.2 Relationship to earlier uses of economic space

The name has an important historical collision. Perroux (1950) used *economic space* for abstract spaces defined by plans, fields of forces, and homogeneous aggregates at macro and regional levels. The present paper uses *entrepreneurial economic space* in a narrower decision sense: a bounded, outcome-defined arena in which potential suppliers contest a producer prize. The term is retained because it grew independently inside the archive, but no priority is claimed for the words themselves.

1.3 Contributions and nonclaims

The paper makes four contributions:

- It formalizes *V/N* as a space-level gross prize-density benchmark and gives exact assumptions under which it is valid.
- It shows why raw value and raw headcount are not sufficient when claimants differ, then introduces serious-competitor weights and entrant-relative competitor equivalents.
- It derives the entrant layer from execution probability and monetized resource exposure, preventing competition from being counted twice and avoiding arbitrary dollar-hour products.
- It adds endogenous density, free-entry compression, barrier duality, private-social divergence, and a preregisterable empirical ledger.

No claim is made that equal-share arithmetic, contest models, entry thresholds, real options, or zero-profit entry are individually new. The intended contribution is their integration into a founder-facing theory whose inputs remain separable enough to estimate and falsify.

2. From 409 Posts to One Research Question

A full-text audit of all 409 posts identified 80 essays containing substantive mechanisms about markets, entrepreneurship, production, distribution, capital, work, access, or competition. The sequence below is the shortest path from the original intuitions to the present model. Dates identify publication, not evidentiary rank.

Archive source	Mechanism carried into the model
Economic Spaces (17 Aug 2025)	Names spaces; treats creating spaces and opening access as a mobility and dignity problem.
Andrew Tate and Exceptionalism (14 Aug 2025)	Local versus global arenas; niche choice; heterogeneous and winner-take-most rewards.
On Production (18 Sep 2025)	Production space and sale/distribution space are separately contested; access and inputs matter.
The Global Religion (3 Oct 2025)	Founder time, acquisition cost, development capital, outside salary, and the probability of larger returns.
Money 2 (9 Oct 2025)	States the core: AM = TM / C, Available Market = Total Market / Competition.
Startups (9 Oct 2025)	Opportunity cost, technological leverage, scale, capital, and demand as the eventual bottleneck.
Single Step Theory (15 Oct 2025)	Desired actions have high outcome probability, low difficulty, known inputs, and low monetary burden.
The Startup Algorithm (24 Mar 2026)	Search and implementation consume finite time, energy, stamina, and money; expensive trials shrink search breadth.
Many Startups (17 Apr 2026)	Nominally different products may be the same competitor when they solve the same outcome in the same way.
Why Universities Are Good, Part 1 (12 May 2026)	Public recipes induce entry and can destroy the profitability of the advice.
Pages (12 Jun 2026)	Scarce shelf, search, marketplace, and recommendation positions concentrate rewards among a few claimants.
Sharnification (7 Aug 2026)	Discovery attracts entrants and customers, changing margins, quality, and the space itself.
A New Mind (11 Aug 2026)	Internet and AI lower build and iteration costs while accelerating entry and imitation.

Table 1. Intellectual genealogy. These essays supply concepts and contradictions that the formal model must resolve; they are not substitutes for external data.

2.1 Internal contradictions are productive

The archive also contains the reasons a one-line formula cannot be the entire theory. It says rewards are concentrated among a few winners but also divides value equally by competition. It praises large scalable prizes while later pricing the development, acquisition, and salary costs they require. It sees capital and effort as burdens to the entrant, yet hard spaces may protect incumbents from followers. It argues for opening access even though more access can reduce private prize density. These are not defects to hide. They generate the distinctions between a benchmark and a distribution, private value and social value, entrant burden and incumbent moat, and static score and dynamic equilibrium.

2.2 Closest economic antecedents

Literature	What it already explains	Role here
Contest theory	Effort or strength maps into probabilities or shares of a prize (Tullock; Skaperdas).	Supplies the unequal-competitor generalization.
Industrial organization	Market size, entry thresholds, fixed and sunk costs, conduct, and endogenous concentration (Bresnahan-Reiss; Berry; Baumol-Willig; Sutton).	Limits literal 1/N and supports free-entry compression.
Strategic factor markets	Commonly anticipated strategic value is capitalized into resource prices; capabilities and expectations differ (Barney).	Explains why a published high score can erase itself.
Entrepreneurial choice	Opportunities combine gain, loss, and feasibility; capital, risk tolerance, and uncertainty shape entry (Shane-Venkataraman; Scheaf; Kihlstrom-Laffont; Evans-Jovanovic).	Supplies p, R, outside options, and uncertainty intervals.
Real options and experimentation	Waiting, staged tests, abandonment, and search have option value under irreversibility.	Makes the framework a decision-date diagnostic rather than a one-shot command.
Organizational ecology	Niches and density can both legitimate and crowd organizational populations (Carroll).	Motivates nonmonotone competition effects.

Table 2. Novelty boundary. The proposed contribution is the integrated decomposition and measurement program, not priority for the ingredients.

3. Defining an Entrepreneurial Economic Space

A formula using total value and competitors is only as good as its boundary. If a space can be redrawn after seeing the answer, both numerator and denominator can be manipulated. The boundary must therefore be frozen at the decision date.

$$s = (\text{paid outcome, buyer set, solution class, geography, channel, rules, horizon})$$

Definition 1. An entrepreneurial economic space

The paid outcome is primary. Product labels are often too narrow or too broad. A database chatbot, an analyst, an internal script, and a bundled platform feature may be real competitors if buyers use them to obtain the same outcome. Conversely, two products in the same industry code may occupy different spaces when their customers, channels, geography, regulation, or use cases do not overlap. For example, 'email software' is not a usable space. 'AI triage of privileged email for North American legal teams, sold through Microsoft channels over five years' is closer to one.

3.1 Total economic value V

For the private-entry model, V_s is the decision-date present value of the contestable producer contribution pool, conditional on the space existing over horizon H. It is net of variable delivery cost but gross of the focal entrant's sunk setup costs. A bottom-up benchmark is:

$$V_s = \text{sum}_{t=1..H}\ \text{delta}^t\, B_{st}\, A_{st}\, m_{st}\, c_{st}$$

buyers x annual spend x contribution margin x contestable fraction, discounted

This is deliberately not headline TAM. Revenue, gross contribution, producer profit, consumer surplus, and social value are different ledgers. If the phrase 'total economic value' is intended to mean total social surplus T, a producer capture fraction a is required so that the private prize is $V = aT$. An open-source tool may create immense social value while offering little producer prize. A Bertrand market may contain large buyer expenditure while offering zero producer profit.

3.2 Real competitors N

A real competitor in N is a credible claimant on the same producer pool; the contemplated entrant is included. A wider competitive alternative may instead be an outside option that constrains the paid outcome. Direct products, substitutes, bundled features, internal provision, and manual alternatives matter only when buyers would switch to them or they occupy the same distribution bottleneck. A noncommercial alternative that receives no producer prize must reduce V's contestable fraction and cannot enter the b/lambda sharing denominator. A bundled provider belongs in that denominator only when it actually claims value from the same producer pool. Mere logical possibility is not competition. A nominal entrant with no product, commitment, access, or financing should receive weight near zero.

Shared pool and post-entry denominator
Real competitors belong in one denominator only when they are credible claimants on the same V; their conditional capture shares must sum to one. If there are n serious incumbents and the contemplated entrant would be comparable to them, the symmetric denominator is N = n + 1. A space with no incumbent has N = 1 after contemplated entry, not N = 0.

3.3 Seriousness weights

Headcount is only the first-pass benchmark. Serious rivals differ in economic strength. Let a_{is} be rival *j*'s ex-ante, space-specific competitive strength. Where available, an attributable enterprise value or discounted future cash-flow valuation is a useful anchor. It must be attributable to this space rather than the entire company. A diversified incumbent's global market capitalization should not be assigned to a small product line. Other evidence can include current space revenue, distribution access, brand and trust, installed customers, product quality, data, regulatory permission, and observed buyer overlap.

The strength variable should be fixed before the focal outcome is observed. Using a valuation that already reflects the entrant's eventual capture to predict that same capture is circular. When valuations are unavailable, preregistered component weights or a share model estimated on earlier cohorts can be used. All monetary strength evidence must use the same decision date, horizon, and economic ledger as V.

$$b_{js} = \lambda_{js}\, a_{js}^{\rho}$$

$$\theta_{js} = b_{js} / \Sigma_k\, b_{ks};\ \Sigma_j\, \theta_{js} = 1$$

$$N^{eff}_{is} = 1 / \theta_{is} = \Sigma_k\, b_{ks} / b_{is}$$

$$\text{entrant gross prize} = \theta_{is}\, V_s = V_s / N^{eff}_{is}$$

$a_{js} > 0$ is strength; $\rho > 0$ is intensity; $0 < \lambda_{js} <= 1$ is common space relevance

This is the formal meaning of weighted competitors. The normalized weights allocate exactly one common pool: the b terms do not add to V, but determine fractions of V that add to one. A rival twice as strong as the focal entrant can count as more than one entrant-equivalent; a hobby participant can count as nearly zero. The count is entrant-relative: a powerful incumbent can face fewer equivalent rivals than a weak entrant in the same space. Partial buyer overlap should be handled by common buyer segments or by lambda fixed for the space, not by pairwise denominators that assign incompatible shares.

3.4 Three counts that should not be confused

Measure	Definition	Proper use	Main risk
Literal N	1 + preregistered serious incumbents	Primary falsifiable symmetry benchmark	Treats unequal claimants equally
Strength N_eff,i	sum_k b_ks / b_is using one common normalized ledger	Sensitivity analysis when strength evidence exists	Weights can become subjective
Capture N_eff,i	1 / predicted conditional share theta_i	Entrant-specific contest or demand model	Tautological if fitted on the same outcome
Inverse HHI	1 / sum of squared observed shares	Descriptive concentration equivalent	Not a prospective entrant's expected share

Table 3. A raw count remains the cleanest test of the original claim. Weighted and capture-equivalent counts require independent estimation.

Market boundaries should follow substitution rather than industry labels. The DOJ and FTC's market-definition framework similarly asks whether customers would switch in response to worsened terms and recognizes closer and more distant substitutes. Economic Space Theory adopts that discipline for entrepreneurial measurement while adding channel and distribution bottlenecks from the archive.

4. The Fixed Heart: V Divided by N

The ratio is exact as an ex-ante mean under symmetry, but insufficient without it.

Let a space contain an integrable producer prize *P* and *N* claimants. Let Q_j be claimant *j*'s realized share, with nonnegative shares adding to one in every state. Actual rewards may be equal, highly skewed, or winner-take-all. The central issue is whether claimants are exchangeable before the outcome is known.

Proposition 1 - Symmetric prize benchmark

If the joint distribution of the prize and all capture shares is invariant to relabeling the N claimants, and the shares exhaust the prize, each claimant's expected gross capture equals expected total prize divided by N.

$$E[P\,Q_i] = E[P] / N$$

Reason. Permutation invariance makes every E[PQ_i] equal. Their sum is E[P sum Q_i] = E[P]. Dividing by N gives the result. Equal realized shares are not required.

This result establishes the strongest version of the framework's fixed right-hand side. It also fixes its interpretation. *V/N* is a gross ex-ante mean for exchangeable claimants, not a company valuation, a median outcome, a guarantee, or net profit. In a contest where one of eight symmetric entrants captures half the prize and most capture four percent, each label can still have a 1/8 expected share before ranks are known. A typical realized entrant can nevertheless earn much less than the mean.

Proposition 2 - Value and headcount are not sufficient

For fixed V and any N of at least two, a focal entrant's conditional share can take any value from zero to one while all shares still add to one. Therefore V and N alone do not identify entrant value without symmetry or an independently estimated capture model.

$$(V, N) \text{ does not identify } \theta_i V$$

Reason. Choose any a in [0,1], assign share a to the focal entrant, and distribute 1-a among the other N-1 claimants. The same V and N are compatible with every focal gross capture between zero and V.

A numerical counterexample is immediate. With *V* = 100 and two firms, shares may be 99 and 1 rather than 50 and 50. The formula has not failed; the symmetry assumption has. This is why competitor seriousness and entrant strength belong in the general model.

Proposition 3 - Competitor-equivalent representation

Suppose every claimant receives a positive, ex-ante space weight b_j and conditional capture is its normalized share of the common weight ledger. Then the focal share can be written exactly as the inverse of an entrant-relative effective competitor count, while all shares sum to one.

$$\theta_i = b_i / \Sigma_j\, b_j = 1 / N^{\text{eff}}_i;\ \Sigma_i\, \theta_i = 1$$

Reason. Divide the common denominator by focal weight b_i. Equal claimants recover N_eff = N; unequal claimants contribute fractional or multiple competitor-equivalents relative to i.

Contest success functions have a long economic lineage. Tullock (1980) and Skaperdas (1996) study functions in which effort or strength maps into winning probability; the same normalized form can describe proportional prize allocation. Economic Space Theory borrows that machinery for 'serious competitors.' The proposed contribution is the use of entrant-relative competitor equivalents to preserve the conceptual *V/N* heart while refusing to equate a nominal logo with a serious claimant.

Falsifiability guard
Defining N_eff after the fact as V divided by realized capture makes V/N an identity. For a genuine test, use either a preregistered literal count, weights fixed before the outcome, or capture predictions cross-fitted from other entrants and cohorts.

4.1 Why inverse HHI is not the answer

The inverse Herfindahl-Hirschman Index is a useful numbers-equivalent measure of concentration (Adelman, 1969): 1 divided by the sum of squared market shares. It equals the literal number of firms only under equal shares. It is not, in general, the denominator for a prospective entrant. It describes the concentration of incumbents and corresponds to a size-weighted incumbent perspective. In the worked example below, eight firms have inverse HHI of only 3.30; dividing the prize by 3.30 would greatly overstate the mean prize of an ex-ante labeled entrant.

4.2 A direct test of the division law

Among ex-ante exchangeable qualified entrants and holding the value pool fixed, the theory predicts an elasticity of gross capture of +1 with respect to *V* and -1 with respect to literal *N*. This restriction can be estimated rather than assumed. Bresnahan and Reiss (1991) provide a strong warning: the competitive effect of the second and third entrant can be much larger than that of later entrants. Rejection of the -1 restriction would not make the framework useless; it would identify where symmetric prize density is too crude and weighted capture or a structural demand model is required.

5. Deriving Probability, Effort, and Capital

The preliminary multiplicative heuristic placed probability above the product of effort and capital, then multiplied by total value per competitor. Its intuition is sound: higher success probability helps, while greater effort and capital burden hurt. Its literal units are not. If effort is measured in hours and capital in dollars, dividing by their product produces value per hour and changes merely because hours are relabeled as days. It also treats capital committed as capital consumed.

5.1 The unrestricted expected-value equation

Let A_i indicate that entrant *i* reaches the specified operational threshold, Q_i be its conditional share, P_s be the realized producer prize, and $R_i(x)$ be the economic resource exposure under plan *x*. The unrestricted one-horizon equation is:

$$\mathrm{ENPV}_i(x) = \mathrm{E}[A_i\, Q_i\, P_s] - R_i(x)$$

No independence assumption is hidden here.

The compact model defines $p_i(x)$ as the decision-date probability of operational viability and $theta_i(x)$ as value-weighted conditional capture. Let $V_s = \mathrm{E}[P_s]$ be the common decision-date prize forecast. The compact equation additionally requires mean independence, $\mathrm{E}[P_s \mid A_i{=}1] = V_s$. If entrant viability is associated with a different total prize, replace V_s by the conditional forecast $V_{s|Ai}$; the unrestricted expectation remains canonical.

$$\mathrm{ENPV}_{is}(x) = p_{is}(x)\, \theta_{is}(x)\, V_s - R_{is}(x)$$

$$= p_{is}(x)\, V_s / N^{\mathrm{eff}}_{is}(x) - R_{is}(x)$$

Equation 1. Entrant-specific expected net value under the stated benchmark assumptions

5.2 The probability term

The probability term must exclude competitive capture. It is the probability of reaching a preregistered technical and commercial-operating milestone under the declared resource policy: for example, a functioning product, regulatory permission, and the ability to serve customers at a target unit margin. If 'success' already means beating the market or attaining a target share, multiplying by 1/*N* counts rivalry twice.

For genuinely new spaces, *p* is not an objective physical frequency. Knight (1921) distinguishes measurable risk from entrepreneurial uncertainty, and Ellsberg (1961) shows why a single precise probability may not summarize ambiguous beliefs. The ledger should therefore record a posterior distribution, interval, or multiple scenarios, plus calibration evidence. A conservative bound is $p_{low} V_{low}/N_{high} - R_{high}$.

5.3 Resource exposure R

$$R_i(x) = K_{\mathrm{consumed}} + w_i E_i + \mathrm{financing} + \mathrm{regulatory} + \mathrm{setup\ costs} - \mathrm{salvage}$$

Equation 2. Full discounted economic exposure

Founder effort is monetized at a declared shadow wage or outside option. Capital is the expected economic cost or loss under the policy, not automatically the amount raised; peak liquidity required should be reported separately. Distribution setup belongs in exposure because the archive correctly treats the space of sale as distinct from the space of production. Stage-gated experiments use expected resources consumed under their stopping rule rather than the cost of blindly completing every stage.

Proposition 4 - Entry threshold and benefit-cost equivalence

For a fixed plan with positive resource exposure, define I = pV/(N_eff R). Expected NPV is positive exactly when I exceeds one. For the optimized symmetric benchmark, let the feasible plan set X be nonempty and compact, let p and R be continuous with p(x) and R(x) positive, and define the attained minimum burden kappa = min_x R(x)/p(x). Entry has nonnegative optimized ENPV exactly when gross prize density G reaches or exceeds kappa.

$$I > 1 \text{ iff } ENPV > 0; \max_{x \text{ in } X}[p(x)G - R(x)] >= 0 \text{ iff } G >= \min_{x \text{ in } X} R(x)/p(x)$$

Reason. Divide ENPV = pG-R by positive R for the first equivalence. Compactness and continuity ensure the minimum is attained. A plan has pG at least R exactly when G is at least its R/p; optimization selects the least attainable burden.

5.4 Ratio and scale can disagree

The benefit-cost index is useful under severe resource rationing, but it is not wealth created. A project with probability-adjusted gross value 2 and cost 1 has index 2 and ENPV 1. A second with gross value 150 and cost 100 has index 1.5 and ENPV 50. The ratio selects the first; expected NPV selects the second. This is the classic capital-rationing problem in modern clothing (Lorie and Savage, 1955). Both outputs must be reported.

5.5 Effort and capital are choices, not only penalties

Effort and capital can raise operational probability and competitive strength even as they impose cost. The entrant therefore chooses a plan rather than accepting a fixed denominator:

$$O_{is} = \max_{e,k} [p_{is}(e,k)\, \theta_{is}(e,k)\, V_s - R_{is}(e,k)]$$

Equation 3. Optimal entrant-space value

At an interior optimum, the value of the marginal probability and capture-share gains equals marginal resource cost. For effort, $V[\text{theta } p_e + p \text{ theta}_e] = R_e$, with an analogous condition for capital. This is why the preliminary heuristic's left side should be derived, not merely multiplied together.

6. What the Theory Implies

6.1 Niche partition and localized opportunity

The archive's move from global status to localized niches has a precise ratio implication. Suppose a broad space is partitioned into disjoint occupied niches with additive value and competitor-occupancies. The aggregate ratio is a competitor-weighted average of the niche ratios.

Proposition 5 - Niche-partition bound

Let V = sum_k V_k and N = sum_k n_k for disjoint niche occupancies with n_k positive. Then the broad prize density lies between the lowest and highest niche prize densities. At least one niche is no worse than the pooled ratio and at least one is no better.

$$\min_k(V_k/n_k) <= V/N <= \max_k(V_k/n_k)$$

Reason. Write V/N as sum_k (n_k/N)(V_k/n_k). The nonnegative weights n_k/N add to one, so the aggregate is a weighted mean.

The proposition does not say every niche is good. It says broad aggregation can hide both the best and worst density. A prospective founder must use the post-entry niche denominator $n_k + 1$, include capability weights, and then apply entrant probability and cost. It formalizes why a smaller local or vertical space can dominate a larger global category.

6.2 Validation versus crowding

Competition does not always reduce value one-for-one. Early entrants can validate demand, educate customers, build standards, create complementary infrastructure, or increase trust. Later entrants can crowd margins and attention. Let both total value and entrant feasibility depend on the competitor mass, and let resource cost change with ecosystem maturity.

Proposition 6 - Density response

For the gross prize G(N) = V(N)/N, prize density falls with competitor mass only when total value grows less than proportionally with N. For the benefit-cost index I(N) = p(N)V(N)/[N R(N)], the log response equals the sum of category-validation elasticities minus the unit crowding term and cost elasticity.

$$d \log G / d \log N = \varepsilon_V - 1; d \log I / d \log N = \varepsilon_p + \varepsilon_V - 1 - \varepsilon_R$$

Reason. Differentiate the logarithms. A hump-shaped relationship arises when validation and cost reduction dominate early, but their summed elasticity later crosses below one.

This repairs the false implication that fewer visible competitors is always better. Zero incumbents may mean an undiscovered opportunity, but it may also mean no demand, no category legitimacy, or impossible distribution. A high-quality empirical version must estimate how *V*, *p*, and *R* respond to density rather than holding them silently fixed.

6.3 Free-entry compression and discovery reflexivity

Proposition 7 - Space filling under free entry

Condition on identical risk-neutral entrants already qualifying as viable claimants. Assume fixed expected prize V, entry cost F, equal expected division, and unrestricted sequential entry. Expected profit with n firms is V/n-F. If V is at least F, the stable integer count is floor(V/F), with existing entry nonnegative and one more entrant negative.

$$n^* = \text{floor}(V/F); V/n^* - F >= 0 > V/(n^*+1) - F$$

Reason. The inequalities imply n* <= V/F < n*+1. At n*, the gross benefit-cost ratio lies between 1 and 1+1/n*. This is the standard free-entry condition expressed in space notation. Entrant-specific viability remains in the separate p layer.

A visible high score therefore changes the object being scored. If *m* equivalent entrants arrive while *p*, *V*, and *R* remain fixed, the index is multiplied by *N*/(*N*+*m*). Public playbooks, platform rankings, or an essay announcing an easy space can shorten its rent window. Barney's strategic factor market argument supplies a parallel mechanism: if everyone anticipates a resource's future value, that value is capitalized into its acquisition price.

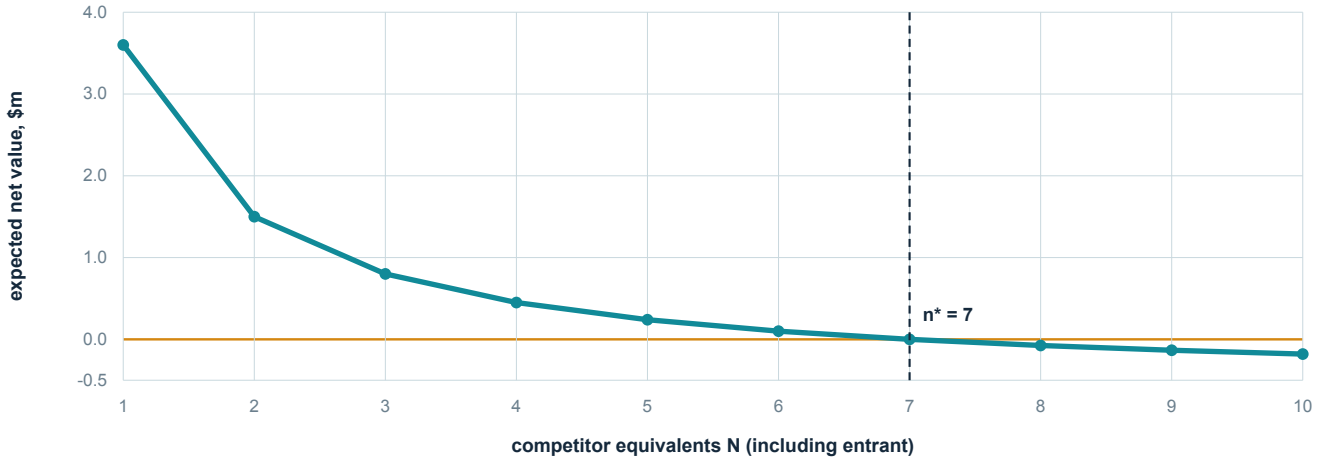

Figure 2. A separate stylized space-filling example: V = $4.2m and F = $0.6m. Conditional expected NPV reaches zero at seven competitor-equivalents and becomes negative for the next entrant.

6.4 Barrier duality

The same difficulty has opposite meanings on opposite sides of entry. A sunk cost, license, specialist skill, or distribution relationship burdens the prospective entrant but can protect those already inside. In the conditional continuous free-entry benchmark, *n** = *V*/*F* and equilibrium gross prize density is *G** = *F*. Persistent high *V*/*N* can therefore be evidence of a hard barrier rather than free money. Outside this homogeneous benchmark, the opportunity belongs to an entrant whose own probability and exposure make the barrier crossable, not to every observer who sees the ratio.

6.5 Search breadth and cheap experiments

The Startup Algorithm argues that implementation consumes the same finite time, energy, and money required to search further. If a founder can sample m independent candidate spaces at cost c from search budget B, and each has probability r of clearing the founder's entry threshold, then $m = \text{floor}(B/c)$ and the chance of at least one viable space is $1 - (1 - r)^m$. This is an elementary search result, but it captures the archive's key mechanism: cheap tests improve both learning and the number of spaces reachable before ruin.

Real options qualify the static score. Irreversible investment can make waiting, testing, or abandonment valuable even when immediate ENPV is negative (McDonald and Siegel, 1986). Entrepreneurship itself can be experimentation with option value (Manso, 2016; Agrawal, Gans, and Stern, 2021). Economic Space Theory should rank and sequence tests, not command full entry on the basis of a fragile point estimate.

7. Private Opportunity Is Not Social Value

The archive's original normative concern was access: a society that neither opens new spaces nor grants access within established ones risks rigid classes. Private prize density cannot settle that question. More entrants can reduce each claimant's private V/N while improving consumer access, diversity, resilience, or dignity. Conversely, a private entrant can profit largely by stealing business while duplicating fixed costs.

Proposition 8 - Private-social non-equivalence

Let P(n) be producer prize before entrant fixed costs and W0(n) gross total social surplus. A symmetric entrant's private payoff is P(n)/n-F. Its marginal social contribution is W0(n)-W0(n-1)-F. Neither sign determines the other without additional assumptions.

$$\text{private - social} = P(n)/n - [W^0(n) - W^0(n-1)]$$

Reason. Business stealing raises private capture without equal social gain. Variety, innovation, access, and positive spillovers can instead make marginal social value exceed private capture.

Mankiw and Whinston (1986) show why fixed-cost entry can be socially excessive when entrants ignore the output they displace from incumbents. The opposite wedge can arise when entry creates consumer surplus, new access, or positive externalities. The paper therefore maintains two ledgers: private producer value V^P for founder choice, and incremental social surplus V^S for policy. A high private Economic Space Index is not a policy endorsement.

8. Measurement: Keeping the Formula Falsifiable

The unit of observation is an entrant-space-decision-horizon tuple (i,s,t,H). Every boundary, forecast, seriousness weight, and stopping rule is frozen before outcomes are observed. Failed and abandoned attempts remain in the sample. A score calculated only for funded or surviving companies is selection-biased by construction.

Construct	Operational definition	Evidence	Guardrail
Space s	Buyer set in geography/channel seeking a paid outcome under fixed rules and horizon	Customer interviews, procurement, platform category, regulation	Freeze before entry and returns
Value V	PV of buyers x spend x contribution margin x contestable fraction	Bottom-up demand, price, margin, renewal, leakage	Do not substitute headline TAM or social surplus
Literal N	Focal entrant plus preregistered credible substitutes	Consideration sets, diversion, win/loss, buyer switching	Do not count mere logical entrants
Strength a_j	Space-attributable economic seriousness of rival j	Space DCF/enterprise value, revenue, distribution, brand, installed base	Do not use whole-company value or same-outcome fit
p_i(x)	Probability of an operational milestone under plan x	Prior cohorts, entrant covariates, staged test data	Milestone must exclude market share
theta_i	Conditional predicted capture share	Cross-fitted demand or contest model	Never fit on the same entrant outcome
Cash K	PV of nonrecoverable cash consumed	Budget, invoices, financing terms, salvage	Report peak liquidity separately
Effort E	Founder/specialist hours valued at declared shadow wage	Time logs and outside compensation	No retrospective heroic estimates

Construct	Operational definition	Evidence	Guardrail
Exposure R	K + wE + setup, regulatory, financing, and distribution cost - salvage	Declared resource and stopping policy	p is conditional on the same policy
Outcome	Realized discounted entrant contribution, failures coded zero before cost	Complete cohort followed for fixed H	Do not condition on survival or funding

Table 4. Economic Space Ledger. Estimating each input separately preserves interpretability and makes failure diagnostic.

8.1 Measuring serious competitor weights

The underlying intuition is direct: rivals share the total economic value, but they do not share it equally because they are not equally serious. A space-specific discounted cash-flow valuation is often the cleanest weight when reliable forecasts exist. Public-company enterprise value or market capitalization can anchor the calculation only after allocating the portion attributable to the target space. A conglomerate worth 500 billion dollars overall may deploy only a tiny product team against this outcome; assigning the entire valuation would be economically meaningless.

A practical strength score can combine normalized, preregistered components: space-attributable PV, current space revenue, distribution reach, buyer-overlap, renewal, product performance, brand/trust, exclusive data, regulatory access, and committed resources. Each monetary component must match V's decision date, horizon, and producer-value ledger. For a focal entrant with no valuation history, estimate strength from its declared resources and capabilities using earlier cohorts, then report a sensitivity interval. The capture model can estimate the exponent *rho* and common relevance factors *lambda* on earlier cohorts. Market value is evidence of seriousness, not an oracle: high valuation may reflect unrelated businesses, investor beliefs, or the same future cash flows the model is trying to forecast.

8.2 Dynamic competition over the horizon

If the competitor mass changes over time, a single denominator must preserve the discounted stream of per-period prize density. Let v_t be the period producer pool and N_t the period competitor mass. The aggregation-consistent count is the value-weighted harmonic denominator:

$$N^H = [\text{sum}_t \text{ delta}^t v_t] / [\text{sum}_t \text{ delta}^t v_t / N_t]$$

so that V/N^H equals the discounted sum of v_t/N_t

This avoids averaging competitor counts arithmetically when most value arrives in only a few periods. It also forces the analyst to specify the opportunity window rather than treating today's sparse field as permanent.

8.3 Uncertainty and joint simulation

Estimate the joint decision-date distribution of (V,p,N^{eff},R) and propagate joint draws; retain literal N separately for the symmetry test. Generally E[pV/N] is not E[p]E[V]/E[N]. Large value attracts entry; resource plans jointly change probability, cost, and strength; demand shocks alter both value and competition. Report expected NPV, median payoff, probability of loss, lower-tail expected shortfall, and parameter uncertainty. A single optimistic score hides the exact risks entrepreneurship makes nondiversifiable (Hall and Woodward, 2010).

9. Worked Illustration: A Five-Year Software Space

The following numbers are hypothetical. They demonstrate the accounting and the interpretation; they are not presented as an estimate of an actual market. Suppose an entrant evaluates a five-year software space with 20,000 target buyers, annual spend of $4,000, a 60 percent contribution margin, 50 percent contestable demand, and a 10 percent discount rate. There will be eight real claimants after entry under the base symmetry model.

Item	Calculation	Result
Annual contestable pool	20,000 x $4,000 x .60 x .50	$24.000m
Five-year V	$24m x sum_t=1..5 1/1.10^t	$90.979m
Real claimants after entry	N	8
Symmetric conditional share	1/N	12.500%
Gross space prize	G = V/N	$11.372m

Item	Calculation	Result
Operational viability	p	30.000%
Probability-adjusted gross	pV/N	$3.412m
Cash consumed	K	$1.200m
Founder effort	7,500 hours x $100/hour	$0.750m
Economic exposure	R = K + wE	$1.950m
Expected net value	pV/N - R	$1.462m
Benefit-cost index	pV/(NR)	1.750x

Table 5. Checked base-case calculation. Values are present values in millions of dollars.

$$\text{break-even } p^* = RN/V = 17.15\%$$

$$\text{break-even } N^* = pV/R = 13.997 \text{ competitor-equivalents}$$

$$\text{break-even } V^* = RN/p = \$52.000\text{m}$$

Base-case one-variable thresholds; joint uncertainty still requires simulation

The base case is positive in expected dollars, but its margin of safety depends on the joint forecast. If the true rival mass rises from eight to fourteen without offsetting value growth, expected NPV becomes approximately zero. If a serious incumbent counts as three entrant-equivalents rather than one, that fact belongs in the denominator before the decision.

9.1 Winner-take-most stress test

Now suppose eight viable claimants eventually occupy shares of 50, 15, 15, 4, 4, 4, 4, and 4 percent, a superstar-like payoff pattern (Rosen, 1981). Before ranks are assigned, an exchangeable claimant's expected share remains 12.5 percent: one eighth. For this illustration only, the $1.95m resource exposure is deterministic and fully spent before viability is learned. Combining rank uncertainty with 30 percent operational viability produces the following unconditional outcomes.

Outcome	Unconditional probability	Gross capture	Net payoff
Not operationally viable	70.000%	$0	-$1.950m
Niche position	18.750%	$3.639m	$1.689m
Challenger	7.500%	$13.647m	$11.697m
Winner	3.750%	$45.489m	$43.539m

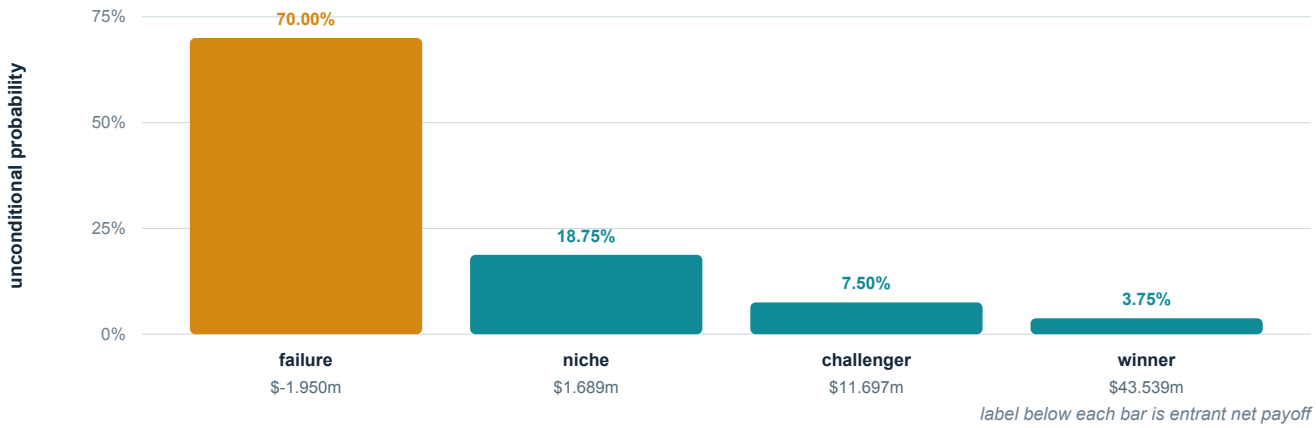

Figure 3. A positive mean can coexist with a negative median. The expected net payoff is $1.462m, but the median payoff is -$1.950m and only 30 percent of attempts have a positive payoff.

The share vector has HHI 0.303 and inverse HHI 3.30 despite eight firms. Dividing the total prize by 3.30 would produce $27.567m and incorrectly label it the average claimant prize. HHI describes concentration; it does not replace the entrant denominator. The example also explains why risk tolerance, liquidity, and outside salary remain essential even when expected NPV is positive.

9.2 Ratio-scale divergence in one line

Suppose a micro-space offers probability-adjusted gross value $0.70m at cost $0.20m, while a vertical space offers $1.40m at cost $0.60m. The micro-space has the higher index (3.50 versus 2.33), but the vertical space has higher expected NPV ($0.80m versus $0.50m). A capital-constrained founder may rationally choose the first; an unconstrained wealth-maximizer chooses the second.

10. An Empirical Program

A framework becomes economics when it risks being wrong. Economic Space Theory should be compared against simpler baselines - total market alone, founder probability alone, industry growth, raw competitor count, and concentration - using forecasts frozen before entry. The components should also be entered separately in regressions before imposing the constructed ratio, so failure can be traced to V, N, p, capture weights, or cost.

Hypothesis	Falsifiable prediction	Design or outcome
H1 Division law	For exchangeable viable entrants and a fixed pool, gross capture elasticity is +1 in V and -1 in literal N.	PPML or share model; jointly test coefficient restriction (1,-1).
H2 Incremental prediction	Ex-ante pV/N-R improves held-out entrant value forecasts over V-only and standard growth baselines.	Calibration, forecast error, top-decile lift, realized decision value.
H3 Real competitors	Outcome-substitution and independently weighted counts outperform industry-code or logo counts.	Held-out comparison of counts; preregistered buyer-switching rule.
H4 Free-entry erosion	Positive exogenous shocks to prize density induce later entry and compress excess returns, especially when sunk costs are low.	Demand-threshold discontinuity or event study, followed through entry cohorts.
H5 Public reflexivity	Publication of replicable high-score opportunities raises entry hazard and shortens rent duration.	Quasi-random publicity or ranking exposure; pretrend and spillover tests.
H6 Resource interaction	Random capital or testing-cost reductions raise viability more in spaces with higher preregistered prize density.	Grant lottery or phased capital experiment interacted with V/N.

Table 6. Falsifiable predictions. Failure of a restriction should revise the relevant layer rather than be hidden inside a recalibrated effective denominator.

10.1 Candidate research designs

- **Marketplace slots:** randomize the number of credible providers shown or admitted within isolated buyer-time cells while holding lead demand fixed.
- **Demand-threshold discontinuity:** exploit eligibility, procurement, or demographic cutoffs that change buyer value before supply fully adjusts, then follow entry.
- **Competitor-exit event study:** instrument local rival mass with headquarters-level shutdowns or nationwide exits unrelated to local demand.
- **Capital lottery:** randomly allocated grants identify the response of operational probability to resources and its interaction with preregistered prize density.
- **Forecasting tournament:** freeze space definitions and every input before entrants choose, then publish out-of-sample calibration on complete attempt cohorts.

Strong designs must observe attempts that never become employers. Accelerator applications, incorporation attempts, marketplace seller registrations, domain or app submissions, and founder panels can supplement business registries. The sampling frame begins at decision or attempt, not survival.

11. Objections, Counterexamples, and Scope

Objection	What fails	Required response
Market boundary can be sliced	V and N can be engineered after seeing the answer.	Freeze paid outcome, buyer, geography, channel, rules, and horizon; publish sensitivity.
A company is not one competitor	A trivial participant and a dominant incumbent are unequal.	Use literal N only as symmetry test; add independently estimated seriousness weights.
Market cap is too broad	Whole-company valuation includes unrelated spaces and expectations.	Allocate space-attributable DCF/enterprise value; triangulate with operating evidence.
V is not fixed	Entry can expand demand, lower price, create standards, or destroy trust.	Estimate V(N); apply the density-response elasticity.
Spending is not profit	Bertrand competition can divide revenue while producer prize is zero.	Use contestable producer contribution, not gross expenditure.
Free substitutes do not earn prize	Counting them as equal firms can double-reduce value.	Put noncapturing alternatives only in V's contestable fraction; reserve b/lambda for providers sharing the producer pool.
Probability is ambiguous	A novel space may not support a precise objective p.	Use intervals, multiple priors, calibration, and staged learning.
p already includes rivalry	Dividing again by N double-counts competition.	Define p as operational viability and theta as conditional capture.
Winner-take-most	V/N is an ex-ante mean, not the typical outcome.	Report full payoff distribution, median, loss probability, and certainty equivalent.
High V/N may be a trap	Persistent density can be caused by the barrier a new entrant cannot cross.	Estimate entrant-specific p, R, and strength; distinguish burden from moat.
Ratio ranking can misallocate	High small-project ROI need not maximize wealth under indivisibility.	Report ENPV and ratio; solve the portfolio problem explicitly.
Private score rewards crowding	Business stealing can be privately positive and socially wasteful.	Maintain a separate marginal-social-surplus ledger.

Table 7. The benchmark's failures are informative. Each maps to a measurable extension rather than an unfalsifiable exception.

11.1 What the theory does not claim

The framework does not claim that every market literally divides profit by firm count; that market value is independent of entry; that valuation weights are objective; that a high ratio guarantees success; that probability is known; that private profit equals social value; or that high effort and capital are always bad. It is a disciplined first-pass decomposition. Its purpose is to make hidden assumptions visible and to direct the next measurement or experiment.

11.2 Where the model is most useful

Economic Space Theory is best suited to comparative entrepreneurial choice before large irreversible commitment: selecting among outcomes, niches, geographies, channels, or technological regimes. It is less useful when the space cannot be bounded, the producer prize cannot be separated from social value, entrant action creates almost all of *V*, or strategic interaction is dominated by bargaining, complementarity, or network formation that a share model cannot capture. In those settings the ledger identifies why a structural game, demand model, or real-options analysis is needed.

12. Conclusion: The Space and the Entrant

Economic space is scarce not only because value is scarce, but because uncontested access to value is scarce.

The archive's durable discovery is the right-hand side: total economic value per real competitor. Under exchangeability, *V/N* is an exact expected gross prize benchmark. Under unequal competition, seriousness weights and entrant-relative competitor equivalents preserve the same structure. A nominal count is not enough: the relevant rivals are credible claimants to the same outcome, normalized through one shared pool using space-specific economic strength and relevance.

The left-hand side belongs to a different layer. The entrant supplies an execution probability and bears resource exposure. Monetized effort, consumed capital, financing, distribution, regulation, and outside options determine whether the gross space prize can be converted into positive expected NPV. A high ratio can be temporary because success attracts entry; a high prize density can reflect a moat that excludes the observer; a privately attractive entry can be socially wasteful; and a socially valuable opening can reduce private rents.

$$V/N = \text{what the space offers under the stated competition model}$$

$$p/R = \text{what this entrant can convert per unit of exposure}$$

$$ENPV = pV/N^{eff} - R = \text{the decision quantity}$$

The memorable separation

The next step is empirical. Freeze spaces before entry, measure producer value bottom-up, count and weight only serious substitutes, estimate operational probability independently of competitive capture, include failures, and compare the model out of sample against TAM and standard concentration measures. If the restrictions fail, the failures will show whether the problem lies in the space boundary, value pool, competitor model, probability, or resource plan. That is the difference between a slogan and a theory.

Appendix A. Technical Notes

A.1 Exact reduced-form representation

Let A_i be the viability indicator, Q_i the realized share, and P the realized producer prize. Define $p_i = \Pr(A_i=1)$, $V_{s|Ai} = E[P \mid A_i=1]$, and value-weighted conditional share $theta_i = E[Q_iP \mid A_i=1] / E[P \mid A_i=1]$. Then $E[AQP] = p_i theta_i V_{s|Ai}$ exactly. Replacing the conditional prize with common V_s requires $E[P \mid A_i=1] = E[P]$. Defining $N^{eff}_i = 1/theta_i$ yields the compact form; it is a reparameterization unless theta is predicted independently.

A.2 Discrete density response

$$G(N+1) <= G(N) \text{ iff } V(N+1) - V(N) <= V(N)/N$$

Entry lowers gross prize density exactly when the incremental value created is no larger than the prior per-claimant prize.

A.3 Free-entry ratio bound

Condition on viable claimants and assume $V >= F$, so n^* is at least one. Let $z = V/F$ and $n^* = \text{floor}(z)$. At stable entry, $n^* <= z < n^*+1$. Dividing by n^* gives $1 <= V/(n^*F) < 1 + 1/n^*$. Thus the conditional gross benefit-cost ratio approaches one as the stable competitor count grows.

A.4 Barrier-duality derivative

Let a barrier parameter b affect viability, value, effective competition, and exposure. With gross probability-adjusted capture $B(b) = pV/N^{eff}$, the entrant benefits from a marginally harder space exactly when $B[\text{d log } p/\text{d}b + \text{d log } V/\text{d}b - \text{d log } N^{eff}/\text{d}b]$ exceeds $\text{d}R/\text{d}b$. The negative effect on rivals must outweigh the focal burden.

A.5 Sensitivity worksheet

Input	Low	Base	High	Source date	Reason for range
V (PV producer pool)					Demand, price, margin, contestability
Literal N after entry					Substitution boundary
Weighted N_eff,i					Common strength ledger, lambda, rho
p_i under plan x					Calibration and milestone
Cash consumed K					Budget, loss, salvage
Founder hours E and wage w					Time log and outside option
Other exposure					Finance, regulation, distribution
ENPV					Joint simulation, not marginal means
Benefit-cost I					Report beside ENPV

Table A1. Blank preregistration ledger. Keeping the source date and reason for every range reduces hindsight laundering.

Appendix B. Formula Map

Question	Recommended quantity	Interpretation
How dense is the gross prize?	$G_s = V_s/N_s$	Space-level symmetric benchmark
What share may this entrant capture?	$\theta_{is} V_s = V_s/N_{eff,is}$	Weighted contest or demand model
Is this fixed plan positive in expectation?	$ENPV_{is} = p_{is} V_s/N_{eff,is} - R_{is}$	Benchmark with common V; otherwise use $V_s\|Ai$
How resource-efficient is it?	$I_{is} = p_{is} V_s/(N_{eff,is} R_{is})$	Dimensionless gross benefit-cost ratio
What plan is best?	$\max_x[p_{is}(x)\theta_{is}(x)V_s - R_{is}(x)]$	Entrant-resource optimization under benchmark assumptions
What is the robust downside?	$p_{low} V_{low}/N_{high} - R_{high}$	Simple conservative bound
What is the social contribution?	$\Delta CS + \Delta PS$ - real costs - external harms	Separate welfare ledger

Practical rule
Start with literal V/N because it is understandable and testable. Add weights only when they are fixed independently and tied to the same economic space. Always report p, R, ENPV, and the payoff distribution separately.

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