

**The entrepreneur as a mediating agent and the valuation of
entrepreneurial firms**

Alberto Dell'Acqua

Luiss Business School and Mercatorum University

Via Nomentana, 216 Rome Italy

Corresponding author: alberto.dellacqua@luissbusinessschool.it

The entrepreneur as a mediating agent and the valuation of entrepreneurial firms

Abstract

Despite a recent resurgence of research on the drivers and methods of entrepreneurial-firm valuation, the field still lacks theoretical foundations able to guide the choice of an appropriate valuation approach. This paper develops one. We characterize the entrepreneur as a mediating agent whose effort to intermediate the firm's innovation to the market is what ties the value of assets in place — the cumulative investments that launched the venture — to the value of business growth options. This concept addresses the foundational issue raised by Zingales (2000), who observed that no theory explains what keeps growth opportunities attached to assets in place. Building on it, we propose a probability-adjusted valuation in which the link between the two values is conditional on entrepreneurial success, and we formalize it in an Extended Entrepreneurial Value equation that embeds the trial-and-error learning of entrepreneurial action, integrating real options reasoning, learning models from cognitive psychology, and a structural analogy with mediated-reaction kinetics.

Keywords: entrepreneur; entrepreneurial firm; firm valuation; new ventures; real options.

JEL codes: M13; L26; G30; G32.

1. Introduction

Scholars continue to debate how to value firms that have foreseeable but uncertain growth opportunities and are still in a development stage (Zhao et al., 2023; Audretsch and Link, 2012; Casson, 2000; Zingales, 2000). Traditional corporate valuation methods often fail to capture the value of such firms or deliver inconsistent results, with practical consequences for the allocation of capital to innovative projects. Despite a recent resurgence of work on the drivers and methods of entrepreneurial-firm valuation (Giakoumelou et al., 2025; Dhochak et al., 2024; Berre and Le Pendeven, 2023; Colombo et al., 2023), the field still lacks theoretical foundations able to guide the choice of an appropriate valuation approach.

This paper develops such a foundation. We propose a conceptual characterization of the entrepreneur as a mediating agent whose effort to intermediate the firm's innovation to the market is what ties the value of assets in place — the cumulative investments that launched the venture — to the value of business growth options. This concept addresses the foundational issue raised by Zingales (2000), who observed that no theory explains what keeps growth opportunities attached to assets in place. Building on it, we introduce a probability-adjusted valuation in which the link between the two values is conditional on entrepreneurial success, and we formalize it in an Extended Entrepreneurial Value (VE) equation that embeds the trial-and-error learning of entrepreneurial action. The contribution is conceptual and integrative, bringing together real options reasoning, learning models from cognitive psychology, and a structural analogy with mediated-reaction kinetics in biophysics.

2. The entrepreneur as a mediating agent

We start with the definition of the entrepreneur. Although many existing definitions are conceptually appropriate (Audretsch and Link, 2012; Baron, 2007; Shane, 2003), we reassess the notion of opportunity. In our view the entrepreneur has the clear purpose of bringing a

firm's innovation to the market in order to generate a business opportunity; the entrepreneur does not necessarily invent the underlying innovation but endeavours to exploit it commercially (Kuckertz et al., 2017; Choi and Shepherd, 2004). This view is close to Peng et al. (2014), Burgelman and Hitt (2007) and Blesa and Ripollés (2003), and to the resolution of the entrepreneurial puzzle in a dynamic framework (Deligonul et al., 2008; Kirzner, 1997).

Proposition 1. An entrepreneur intermediates a firm's innovation to the market to create and exploit a business opportunity.

In our perspective the opportunity does not materialize in a business sense until the entrepreneur is able to intermediate it to the market. The effort of intermediation is what links business opportunity, and its potential exploitation, to the investments initially made. Moving from Ireland et al. (2003), the entrepreneurial firm can then be defined as a bundle of assets — physical or human — organized around an innovative concept. The entrepreneur intermediates the firm and its innovation to the market (Peng et al., 2014); if the market accepts the innovation through repeated demand, the firm begins to exploit the related opportunity. The entrepreneur is also the owner of the firm's assets, so that the entrepreneur and assets are symbiotically interlocked; once intermediation succeeds, the entrepreneur may withdraw, change role or be replaced by managers.

Proposition 2. The entrepreneurial firm is a bundle of assets distinguished by innovative features in which the entrepreneur holds an equity stake.

Two values of the firm can then be distinguished: the value in the market and the value outside the market, that is, when the innovation has not yet been accepted and business opportunities remain unexploited. This mirrors Myers' (1977) view of the firm as assets in place plus growth options and motivates methods such as Real Options Valuation (ROV) rather than discounted cash flow (DCF). However, ROV rests on the unexplained assumption criticized by Zingales (2000): what is the "glue" that keeps growth opportunities attached to

assets in place. We propose that entrepreneurial action is that glue, and that the probability of its success is the adjustment needed to combine the two values. The potential success or failure at the heart of real options reasoning (McGrath, 1999) should not be assumed embedded from launch but conceived as the result of entrepreneurial action.

Proposition 3. The value of the entrepreneurial firm is the sum of the value of assets in place and the value of business growth options, conditional on entrepreneurial success in intermediating the firm's innovation to the market.

3. A probability-adjusted valuation of the entrepreneurial firm

The classic structure for valuing a firm with growth options is:

$$\text{Value of the entrepreneurial firm} = \text{Value of assets in place} + \text{Value of business growth options.} \quad (1)$$

The limitation lies in the “+” sign, which implicitly assumes that the options' value is always and certainly linked to assets in place. Introducing the probability of success $p \in (0,1)$ of entrepreneurial action yields:

$$\text{Value of the entrepreneurial firm} = \text{Value of assets in place} + p \cdot \text{Value of business growth options.} \quad (2)$$

The value of assets in place can be taken as the cumulated discounted value of the cash flows needed to develop the firm before market entrance, i.e. the assets' replacement value ($\text{NPV}_{\text{static}}$). The growth-option value can be assessed deterministically (DCF) or probabilistically (decision-tree analysis, ROV, Monte Carlo); the latter better reflects market

uncertainty. Equation (2) can thus be formalized through real options and the concept of extended net present value:

$$\text{Extended NPV} = \text{NPV}_{\text{static}} + \text{Entrepreneurial ROV}. \quad (3)$$

This resembles compound-option approaches to R&D valuation (Perlitz et al., 1999) and the staged real-options logic in Titman and Martin (2008), with one substantial difference: in our framework the distribution of probabilities of achieving future cash flows is conditional on the success of entrepreneurial action. When entrepreneurs succeed in bringing the innovation to the market, their action reveals that distribution, and the growth options become a “business voucher” for the firm.

The entrepreneur thus acts as a mediating agent between current investments and future potential — not merely managing assets but, through trial-and-error, activating the value of latent opportunities. To capture this learning, we reassemble the ROV term using a logic analogous to reinforcement-learning models in cognitive psychology (Rescorla and Wagner, 1972) and to mediated-reaction kinetics in biophysics, as in the Arrhenius (1889) equation. The analogy is structural, not literal: just as in the Arrhenius equation the reaction rate depends exponentially on an activation term and is accelerated by a mediating agent (a catalyst), here the probability of linking investment to growth depends exponentially on entrepreneurial effort and is accelerated by the entrepreneur acting as mediating agent. We write $\text{ROV} = f(\alpha, e, \sigma)$, where α is the entrepreneur’s learning efficiency in reducing failed attempts (reinforcement learning), e is the effort invested in exploring the opportunity, and σ is market uncertainty — which, as in real options, raises the value of the growth potential because the entrepreneur retains the right not to act in adverse scenarios.

Integrating real-options logic with learning and the cost of effort, we introduce the Extended Entrepreneurial Value (VE):

$$VE = NPV_{\text{static}} + [P(\alpha, e) \cdot \text{Call}(S, K, \sigma, t) - C(e)]. \quad (4)$$

Here $P(\alpha, e) = 1 - \exp(-\alpha e)$ is a success multiplier: a saturation function that increases towards 1 as effort e and learning ability α grow. $\text{Call}(S, K, \sigma, t)$ is the value of the opportunity, expressed through a financial-option structure, with S the present value of future cash flows, K the cost of activating the opportunity, σ the market volatility and t time. $C(e)$ is the cost of entrepreneurial effort; if the cost of further attempts exceeds the value created by learning, the agent stops mediating. Importantly, σ and $P(\alpha, e)$ capture two distinct sources of uncertainty and do not double-count risk: σ prices the market volatility embedded in the option payoff, whereas $P(\alpha, e)$ conditions the very existence of the link between investment and growth options. Economically, the entrepreneur reduces noise in market signals (through α), lowers the activation effort by breaking a high-risk opportunity into small experimental steps (compound options), and stabilizes the opportunity: once trial-and-error succeeds ($P \rightarrow 1$), the growth value “sticks” to the balance sheet and becomes the new NPV_{static} for the next cycle.

4. Optimal entrepreneurial effort

The framework yields the entrepreneur’s optimal level of effort. Writing the option value $\text{Call}(S, K, \sigma, t)$ as ϕ and assuming a constant marginal cost c (so that $C(e)$ is linear in e):

$$VE = NPV_{\text{static}} + [(1 - \exp(-\alpha e)) \cdot \phi - C(e)]. \quad (5)$$

Differentiating with respect to effort e and setting $\partial VE/\partial e = 0$ (the constant NPVstatic drops out) gives the first-order condition:

$$\alpha \cdot \phi \cdot \exp(-\alpha e^*) = c. \quad (6)$$

Isolating the exponential and taking natural logarithms yields the optimal effort:

$$e^* = (1/\alpha) \cdot \ln(\alpha\phi / c). \quad (7)$$

The optimum equates the learning margin to the marginal cost of effort. Optimal effort increases with the value of the opportunity ϕ and decreases with the marginal cost c , while the learning coefficient α both scales the responsiveness of success to effort and tempers the number of attempts required to durably link investment and growth.

5. Implications and future research

The probability-adjusted approach in equation (4) addresses the main theoretical limitation of common valuation methods for new ventures by introducing the entrepreneurial probability of successfully intermediating the innovation. From an investor's perspective this probability can be read as an implied discounting factor: the higher the estimated probability of success, the lower the implied discount. This mirrors how entrepreneurs and investors bargain around pre-money values from different perspectives of success. The framework fits ventures based on the creation of opportunities (e.g. social networks first built and only later monetized) better than those based on the discovery of pre-existing opportunities, where the

real option is harder to distinguish from path dependency (Alvarez and Barney, 2007; Adner and Levinthal, 2004).

To illustrate, consider an energy-sector start-up funding $e = 5$ battery prototypes with a learning coefficient $\alpha = 0.4$. The success multiplier is $P = 1 - \exp(-0.4 \cdot 5) = 1 - \exp(-2) \approx 0.865$. If the market opportunity (the call) is worth €10 million, the activated real-option value is about €8.65 million, which, net of effort costs, is added to NPVstatic. The function is calibrated from past effort relative to successes obtained, allowing one to estimate the effort needed to durably link an opportunity to the firm's balance sheet.

Recalling Fisher (1930), who first noted that options belong to business owners, our framework confirms that such options accrue to entrepreneurs, but only when they succeed in intermediating the firm and its innovation to the market. Two research avenues follow. First, the relationship between equity financing and entrepreneurial risk-taking deserves further study, especially for ventures reaching extreme valuations such as “unicorns” (Giardino et al., 2023; Kotha et al., 2022); examining the role of equity and hybrid instruments (e.g. convertible notes) could clarify why entrepreneurs commit capital and under-diversify (Moskowitz and Vissing-Jørgensen, 2002). Second, more evidence on how to measure the probability of entrepreneurial success in different contexts would help operationalize the proposed methodology.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used a generative AI assistant in order to language-edit the manuscript. After using this tool, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

References

- Adner, R., Levinthal, D.A., 2004. What is not a real option: considering boundaries for the application of real options to business strategy. *Acad. Manag. Rev.* 29 (1), 74–85.
- Alvarez, S.A., Barney, J.B., 2007. Discovery and creation: alternative theories of entrepreneurial action. *Strateg. Entrep. J.* 1 (1–2), 11–26.
- Arrhenius, S., 1889. Über die Reaktionsgeschwindigkeit bei der Inversion von Rohrzucker durch Säuren. *Z. Phys. Chem.* 4 (1), 226–248.
- Audretsch, D.B., Link, A.N., 2012. Valuing an entrepreneurial enterprise. *Small Bus. Econ.* 38, 139–145.
- Baron, R.A., 2007. Behavioral and cognitive factors in entrepreneurship: entrepreneurs as the active element in new venture creation. *Strateg. Entrep. J.* 1 (1–2), 167–182.
- Berre, M., Le Pendeven, B., 2023. What do we know about startup-valuation drivers? A systematic literature review. *Venture Cap.* 25 (4), 385–429.
- Blesa, A., Ripollés, M., 2003. The role of market orientation in the relationship between entrepreneurial proactiveness and performance. *J. Entrep.* 12 (1), 1–19.
- Burgelman, R.A., Hitt, M.D., 2007. Entrepreneurial actions, innovations and appropriability. *Strateg. Entrep. J.* 1 (3–4), 349–352.
- Casson, M., 2000. An entrepreneurial theory of the firm. In: Casson, M. (Ed.), *Enterprise and Leadership*. Edward Elgar, Cheltenham.
- Choi, Y.R., Shepherd, D.A., 2004. Entrepreneurs' decisions to exploit opportunities. *J. Manag.* 30 (3), 377–395.
- Colombo, M.G., Montanaro, B., Vismara, S., 2023. What drives the valuation of entrepreneurial ventures? A map to navigate the literature and research directions. *Small Bus. Econ.* 61, 59–84.

- Deligonul, Z.S., Hult, G.T.M., Cavusgil, S.T., 2008. Entrepreneurship as a puzzle: an attempt to its explanation with truncation of subjective probability of distribution of prospects. *Strateg. Entrep. J.* 2 (2), 155–167.
- Dhochak, M., Pahal, S., Doliya, P., 2024. Predicting the startup valuation: a deep learning approach. *Venture Cap.* 26 (1), 75–99.
- Fisher, I., 1930. *The Theory of Interest*. Porcupine Press, Philadelphia.
- Giakoumelou, A., Salvi, A., Kvasova, O., Rizomyliotis, I., 2025. The start-up's roadmap to private equity financing: substituting discounts with a premium in valuation for growth. *Int. J. Entrep. Behav. Res.* 31 (2/3), 479–497.
- Giardino, P.L., Delladio, S., Baiocco, S., Caputo, A., 2023. Beyond myth: a systematic literature review on the emergence of unicorn firms. *J. Small Bus. Enterp. Dev.* 30 (6), 1156–1177.
- Ireland, R.D., Hitt, M.A., Sirmon, D.G., 2003. A model of strategic entrepreneurship: the construct and its dimensions. *J. Manag.* 29 (6), 963–989.
- Kirzner, I.M., 1997. Entrepreneurial discovery and the competitive market process: an Austrian approach. *J. Econ. Lit.* 35 (1), 60–85.
- Kotha, S., Shin, S.J., Fisher, G., 2022. Time to unicorn status: an exploratory examination of new ventures with extreme valuations. *Strateg. Entrep. J.* 16 (3), 460–490.
- Kuckertz, A., Kollmann, T., Krell, P., Stöckmann, C., 2017. Understanding, differentiating, and measuring opportunity recognition and opportunity exploitation. *Int. J. Entrep. Behav. Res.* 23 (1), 78–97.
- McGrath, R.G., 1999. Falling forward: real options reasoning and entrepreneurial failure. *Acad. Manag. Rev.* 24 (1), 13–30.
- Moskowitz, T.J., Vissing-Jørgensen, A., 2002. The returns of entrepreneurial investment: a private equity premium puzzle? *Am. Econ. Rev.* 92 (4), 745–778.

- Myers, S.C., 1977. Determinants of corporate borrowing. *J. Financ. Econ.* 5 (2), 147–175.
- Peng, M.W., Lee, S.H., Hong, S.J., 2014. Entrepreneurs as intermediaries. *J. World Bus.* 49 (1), 21–31.
- Perlitz, M., Peske, T., Schrank, R., 1999. Real options valuation: the new frontier in R&D project evaluation? *R&D Manag.* 29 (3), 255–269.
- Rescorla, R.A., Wagner, A.R., 1972. A theory of Pavlovian conditioning: variations in the effectiveness of reinforcement and nonreinforcement. In: Black, A.H., Prokasy, W.F. (Eds.), *Classical Conditioning II: Current Research and Theory*. Appleton-Century-Crofts, New York, pp. 64–99.
- Shane, S., 2003. *A General Theory of Entrepreneurship: The Individual–Opportunity Nexus*. Edward Elgar, Cheltenham.
- Titman, S., Martin, J.D., 2008. *Valuation: The Art and Science of Corporate Investment Decisions*. Pearson, Boston, MA.
- Zhao, W., Li, S., Sato, T., 2023. The role of entrepreneurs' empathy in new venture performance: the mediating effects of entrepreneurial orientation. *Entrep. Res. J.* 13 (4), 1113–1137.
- Zingales, L., 2000. In search of new foundations. *J. Finance* 55 (4), 1623–1652.