Luck, Skill and Effort in Business and Career Success: What the Evidence Shows

Luck is a large factor in business success, but not the only one. For extreme outcomes such as which startup becomes a huge exit, chance and timing account for most of the observed variation. For steadier measures such as lifetime earnings or whether a small business survives, persistent personal factors (skill, experience, starting endowments) account for roughly half to two-thirds of the variation. A large share of those "personal" factors were themselves unchosen luck: genes, family and the year you were born.

TL;DR

- **Extreme success is mostly luck. Ordinary success is mostly persistent factors, and many of those are unchosen.** The best structural estimate puts 61.5% of the variation in lifetime earnings on conditions already fixed at age 23 and 38.5% on shocks after that (Huggett, Ventura & Yaron 2011). For venture-backed startups, a founder's previous success only moves the success rate from 18% for first-timers to 30% (Gompers et al., NBER WP 12592, 2006). The published 2010 Journal of Financial Economics version reports 21% for first-timers. Venture capitalists' own scoring of deals correlates only about 0.1 with eventual returns (Kerr, Nanda & Rhodes-Kropf 2014).
- **Skill is real and measurable, but it is a weak, probabilistic edge.** Prior industry experience, age and a track record all predict success. In this data, skill shifts the odds; it does not guarantee outcomes. The more extreme the outcome you condition on, the less it tells you about skill (Denrell & Liu 2012).
- **Confidence: high on the direction, medium on magnitudes for earnings, low on any precise "luck %" for entrepreneurship.** The luck/skill split depends heavily on how success is measured, on what counts as "luck" (is being born talented luck?) and on modelling assumptions. Any single headline percentage is unreliable.

1. Executive Summary

The question. When some people or businesses do far better than others, how much is due to talent, skill and effort, and how much to luck?

Short answer. It depends on what you measure:

- **Ordinary outcomes (earnings, small-business survival).** Persistent differences between people dominate, but they don't settle everything. A leading model of U.S. careers attributes about 60–66% of the variation in lifetime earnings, wealth and well-being to differences that already exist at age 23. These include ability, accumulated skills and wealth. The remaining third or so comes from shocks during working life (Huggett, Ventura & Yaron 2011). georgetown An older, influential model put the pre-existing share even higher: "90% of the total variance in expected lifetime utility is explained by unobserved skill endowments at age 16" (Keane & Wolpin 1997, as summarised by Todd & Zhang 2020, Quantitative Economics).
- **Extreme outcomes (unicorn startups, top fund returns, the richest people).** Luck plays a much bigger role, for two reasons. First, outcomes are extremely skewed: about three-quarters

of venture-backed founders get nothing at exit, while a few get billions (Hall & Woodward 2010). openicpsr Second, the largest successes often come from self-reinforcing "rich-get-richer" dynamics, in which an early lucky break compounds. For that reason, the very top performers are often less reliable evidence of skill than the merely very good (Denrell & Liu 2012). sciencedaily

- **Skill still matters measurably.** Entrepreneurs who succeeded before succeed more often next time (Gompers et al. 2010). repec Founders of the fastest-growing firms average 45 years old, and prior industry experience strongly predicts success (Azoulay et al. 2020). ssrn Some measured traits predict who earns more from entrepreneurship (Levine & Rubinstein 2017). repec Venture-capital firms show performance persistence that even investors can exploit in real time (Harris et al. 2020/2023). repec
- **Much of "talent" is luck in disguise.** About 37–42% of the variation in whether people become entrepreneurs is associated with genes (Nicolaou et al. 2008). Substack Labour-market timing also leaves lasting marks. Graduating in a recession depresses earnings for about a decade (Oreopoulos, von Wachter & Heisz 2012), aeaweb and losing a job in a mass layoff costs 1.4–2.8 years of earnings in present value (Davis & von Wachter 2011). repec
- **People systematically misread their own outcomes.** Across 266 studies, people credit themselves for successes far more than for failures, with an average effect size of d = 0.96, which is very large (Mezulis et al. 2004). semanticscholar Success stories studied without the failures (survivorship bias) inflate the apparent role of skill.

How confident can we be? We can be quite confident about the qualitative picture: skill matters, and luck matters more as outcomes become more extreme and more path-dependent. We are much less confident about exact percentages. "Luck" and "skill" cannot be observed directly; they are inferred through models whose assumptions largely drive the answer. The famous "Talent vs Luck" simulation, which concluded that the most successful are rarely the most talented, is a stylised toy model. Its output turns out to be highly sensitive to its parameters (Elvidge 2020). worldscientific

2. Approach and Methodology

Sources prioritised. I prioritised peer-reviewed papers and working papers that use administrative data or natural experiments, including U.S. Social Security records, U.S. Census business registers, Swedish tax registers and venture-capital deal databases. I also drew on official business statistics (U.S. Bureau of Labor Statistics Business Employment Dynamics, reached here through secondary tabulations), meta-analyses in psychology, and agent-based simulation models (computer simulations of many individual "agents"). Popular books such as Mauboussin's The Success Equation and Frank's Success and Luck frame the debate, but they are secondary sources and I did not rely on them for figures.

Four ways researchers separate luck from skill:

1. **Persistence tests.** If skill matters, past performance should predict future performance. Luck by definition doesn't repeat. Examples are serial entrepreneurs and successive funds from the same VC firm.
2. **Variance decomposition.** Observed variance = variance due to persistent factors + variance due to transient shocks. Statistical or structural models estimate each part. Huggett, Ventura & Yaron is the leading example for lifetime outcomes.

3. **Natural experiments.** Random events such as lottery wins, recessions at graduation or plant-closure layoffs show the causal effect of a pure "luck" shock.
4. **Simulation.** Agent-based models show what distribution of outcomes a given mix of talent and chance would produce. They demonstrate what is possible, not what is true.

Key definitions:

- Luck: outcome-relevant factors outside a person's control at the relevant time.
- Skill: persistent, person-specific capacity that raises expected outcomes.
- Heritability: the share of variation in a trait associated with genetic differences in a given population.
- Kurtosis: how heavy the tails of a distribution are. A normal ("Gaussian") distribution has kurtosis 3.
- Power law: a heavy-tailed distribution in which a few observations are enormous.

Limits of this review. My search budget was finite. Some figures (notably BLS survival rates) come from secondary tabulations of official data and should be checked against the BLS tables before use. I did not obtain direct estimates of how often major career events occur; I flag these gaps explicitly.

3. Findings

3.1 Theory and simulation: how small luck differences become huge outcome differences

Talent vs Luck model. Pluchino, Biondo & Rapisarda (2018), "Talent vs Luck: the role of randomness in success and failure," Advances in Complex Systems 21:1850014 (DOI 10.1142/S0219525918500145), simulate 1,000 agents over 40 years in six-month steps: arxiv

- Talent is normally distributed. worldscientific
- In each step, an agent hit by a lucky event doubles its capital with probability equal to its talent. worldscientific
- An agent hit by an unlucky event halves its capital. worldscientific

Capital ends up following a heavy-tailed (Pareto-like) distribution, and the richest agents are usually of near-average talent but unusually lucky. The authors conclude that talent is "necessary but not sufficient." arxiv semanticscholar

Critiques (important).

- **Sensitivity.** Elvidge (2020), "The Luck in 'Talent versus Luck' Modeling," Advances in Complex Systems 23(03):2050007 (DOI 10.1142/S0219525920500071), finds that the model is "very sensitive to both random sampling and the choice of value for the input parameters." Repeated runs with identical inputs give "a range of output values of over 50% of the mean value." The probability of a lucky event affects maximum capital "almost three times more than any other individual parameter." worldscientific
- **Talent is weak by construction.** An informal (non-peer-reviewed) reimplementation by J.B. Whitmore argues that talent barely matters by construction. In his calculation, the per-step advantage of a 95th-percentile over a 5th-percentile agent is only about 2.6%. github

- **Unverified AI replication.** An AI-generated "living paper" replication on GitHub reports that the released code does not truncate talent as the paper describes, and that the paper's "3%" figure for highly talented winners comes out at about 8% in the paper's own engine. github It is unverified and should be treated with caution.
- **Follow-up work by others.** Hamada (2023), "Luck of Outcome in the Talent versus Luck Model," Advances in Complex Systems (DOI 10.1142/S021952592350008X), shows analytically that a simplified version produces a lognormal (rather than power-law) capital distribution even with normally distributed talent. researchgate
- **Follow-up by the original authors.** Challet, Pluchino, Biondo & Rapisarda (2020), "The Origins of Extreme Wealth Inequality in the Talent versus Luck Model" (arXiv 1907.04237), confirm that a model with only lucky events reproduces the inequality. arxiv This is not an independent check.

My interpretation: the model is a valid **existence proof**: multiplicative dynamics plus random events can turn modest talent differences into extreme, mostly luck-driven outcome differences. It is **not an estimate** of the real-world luck share. That share depends on the parameters, which were not calibrated to data.

Denrell & Liu. Denrell & Liu (2012), "Top performers are not the most impressive when extreme performance indicates unreliability," PNAS 109(24):9331–9336 (DOI 10.1073/pnas.1116048109), show the conditions under which the top performer is not the most skilled. When performance is noisy and subject to rich-get-richer feedback, "whether higher performance indicates higher ability depends on whether extreme performance could be achieved by skill or requires luck." managementcraft In luck-heavy domains, the second-best is a better guide to skill. sciencedaily This is a model result, but it has empirical support in work by the same research programme.

Field experiment. The randomised field experiments of van de Rijt and colleagues (2014), "Field experiments of success-breeds-success dynamics," PNAS (DOI 10.1073/pnas.1316836111), randomly gave early success to some recipients in real funding, endorsement, status and reputation systems. pnas The random early boosts led to more subsequent success. This is causal evidence that arbitrary early luck can compound.

3.2 Persistence: evidence that skill exists

- **Serial entrepreneurs.** Gompers, Kovner, Lerner & Scharfstein (2010), "Performance persistence in entrepreneurship," Journal of Financial Economics 96(1):18–32 (DOI 10.1016/j.jfineco.2009.11.001; NBER WP 12592), study venture-backed founders. In the NBER working-paper version (2006), previously successful entrepreneurs "have a 30% chance of succeeding in their next venture," against 18% for first-time entrepreneurs and 20% for those who previously failed. The published JFE version reports 21% for first-timers and 22% for prior failures. The persistence shows up as skill at choosing the right industry and timing. The authors stress that part of it may come from perceived skill: suppliers and customers commit resources to founders with a track record, so "success breeds success."
    - My interpretation: treat each venture's success as a coin-flip-like event with a base rate of about 20%. A 30% vs 18% persistence pattern then implies a correlation of only about 0.1–0.15 between a founder's consecutive outcomes. On that scale, persistent founder-

level factors account for a modest share of variation in any single venture's success, and venture-specific chance dominates.

- **Age and experience.** Azoulay, Jones, Kim & Miranda (2020), "Age and High-Growth Entrepreneurship," AER: Insights 2(1):65–82 (DOI 10.1257/aeri.20180582), use U.S. Census administrative data. The mean founder age for the 1-in-1,000 fastest-growing new ventures is 45.0, and "prior experience in the specific industry predicts much greater rates of entrepreneurial success." aeaweb Accumulated, learnable skill clearly matters.
- **Traits and earnings.** Levine & Rubinstein (2017), "Smart and Illicit: Who Becomes an Entrepreneur and Do They Earn More?," QJE 132(2):963–1018, find that incorporated business owners as teenagers had higher learning-aptitude scores, higher self-esteem and more illicit or risk-taking behaviour. repec The incorporated self-employed earn more per hour than comparable salaried workers; nber residual hourly earnings are about 18% higher after incorporating, in the working-paper version. nyu The unincorporated self-employed earn much less. nber
- **Venture capital funds.** Kaplan & Schoar (2005, Journal of Finance) found strong persistence across successive funds of the same firm. uncipc Harris, Jenkinson, Kaplan & Stucke (2020, NBER WP 28109, DOI 10.3386/w28109; Journal of Corporate Finance 2023) find that for buyout funds, persistence measured with the information available at fundraising is modest and driven by the bottom quartile. For VC funds, "persistence for VC funds persists even when using information available at the time of fundraising." nber repec VC skill and networks appear real, though access to top deals (a self-reinforcing advantage) is part of the mechanism.
- **Limits of prediction.** Kerr, Nanda & Rhodes-Kropf (2014), "Entrepreneurship as Experimentation," Journal of Economic Perspectives 28(3):25–48 (DOI 10.1257/jep.28.3.25), use one large VC firm's internal data. At the time of investment, the firm's scores had a raw correlation of 0.1 with eventual return multiples, and the score distributions of big winners and failures were statistically indistinguishable. harvard Even expert screeners explain only about 1% of the variance in outcomes ex ante.

3.3 Outcome distributions: why the measure of success changes the answer

- **Business survival (official data, via secondary tabulations of BLS Business Employment Dynamics).** For U.S. private establishments born in the year to March 2015:
  - 79.6% survived 1 year, 50.2% survived 5 years and 34.7% survived 10 years. workspace369 The 10-year figure is attributed to BLS Business Employment Dynamics Table 7 (data to March 2025). One third-party tabulation gives 50.6% at 5 years, so check against BLS Table 7 before use.
  - Five-year survival has stayed between about 45% and 52% for every cohort since 1994. thebrokershopinc
  - Industries differ. Five-year survival was about 61.7% in retail versus 46.8% in information. workspace369
  - The aggregate rate barely moves with the business cycle or the era. This suggests that most failures are idiosyncratic. That fits a large role for venture-specific chance, but it is equally consistent with persistent differences in founder quality.

- **Venture-backed founders.** Hall & Woodward (2010), "The Burden of the Nondiversifiable Risk of Entrepreneurship," American Economic Review (22,004 venture-backed companies), find that the average founder received $5.8 million in exit cash. Yet "almost three-quarters of entrepreneurs receive nothing at exit and a few receive over a billion dollars." stanford openicpsr Measured by expected wealth, entrepreneurship looks attractive; measured by the median, it looks like a losing bet.
- **VC portfolio returns.** Kerr, Nanda & Rhodes-Kropf (2014) report that about 55% of VC-backed startups from 1985–2009 were terminated at a loss and only about 6% returned more than five times the investment. Those few accounted for roughly half of gross returns. Their example VC firm had 62% of investments at a loss. researchgate nber
- **Self-employment earnings.** Hamilton (2000), "Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment," Journal of Political Economy 108(3):604–631 (DOI 10.1086/262131), finds that most entrepreneurs have lower initial earnings and lower earnings growth than in paid employment. The median earnings gap is 35% after 10 years in business, while "a handful of entrepreneurs earn substantial returns." uchicago edegan This contrasts with Levine & Rubinstein's finding for the incorporated. nber The answer differs by definition (incorporated vs all self-employed) and by statistic (median vs mean).
- **Wage earnings.** Guvenen, Karahan, Ozkan & Song (2021), "What Do Data on Millions of U.S. Workers Reveal About Lifecycle Earnings Dynamics?," Econometrica 89(5):2303–2339, use Social Security records. Earnings changes are strongly negatively skewed, with kurtosis "as high as 30 compared with 3 for a Gaussian distribution." In a given year, "most individuals experience very small earnings shocks, and a small but non-negligible number experience very large shocks." Positive shocks to high earners are transitory while negative ones are persistent; the reverse holds for low earners. ssrn repec

Interpretation: the luck share is smallest for averaged, repeated, bounded outcomes (annual wages, survival) and largest for one-shot, multiplicative, unbounded outcomes (exit value, extreme wealth). This is the most robust pattern in the evidence.

3.4 Decomposing lifetime outcomes: initial conditions vs shocks

- **Huggett, Ventura & Yaron (2011).** "Sources of Lifetime Inequality," American Economic Review 101(7):2923–54 (DOI 10.1257/aer.101.7.2923), estimate a model with human-capital shocks and differences in learning ability, initial human capital and initial wealth. In the benchmark, initial conditions at age 23 account for 61.5% of the variation in lifetime earnings and 64.0% of the variation in lifetime utility. With initial wealth added, the figures are 61.2% (earnings), 62.4% (wealth) and 66.0% (utility), leaving roughly 34–39% to shocks over the working life. Alternative moments give 53.8% (earnings) and 57.3% (utility). Initial human capital matters most: a one-standard-deviation increase raises expected lifetime wealth by about 47%, against about 8% for learning ability. The authors note that the paper "is silent on the prior forces which shape the individual differences" at age 23. georgetown georgetown
- **Keane & Wolpin (1997).** "The Career Decisions of Young Men," Journal of Political Economy 105(3):473–522. Todd & Zhang (2020, Quantitative Economics, DOI 10.3982/QE890) summarise the key finding: "90% of the total variance in expected lifetime utility is explained by unobserved skill endowments at age 16." The sample was white men in the NLSY79. Todd & Zhang add that "family background accounts for less than 10% of the total variation in lifetime

utility and… adding cognitive ability as an initial condition only increases the explained variation to 14%." Shocks account for about 10%. Storesletten, Telmer & Yaron (2004, Journal of Monetary Economics) find a ratio of slightly under half from age 22 in their own model. The spread across models (roughly 50–90%) is itself a measure of uncertainty.

- **Heritability.** Nicolaou, Shane, Cherkas, Hunkin & Spector (2008), "Is the Tendency to Engage in Entrepreneurship Genetic?," Management Science 54(1):167–179 (DOI 10.1287/mnsc.1070.0761), study 870 identical and 857 fraternal UK twin pairs. They estimate heritability of 37–42% for entrepreneurship, with little effect of shared family environment. informs planbinstitute Critics note that similar heritability appears for many occupations, so this is not specific to entrepreneurship. Substack

Key interpretive point: "initial conditions" are not the same as "merit." Genes, parental resources, and the cognitive and noncognitive skills formed in childhood are not chosen. On a strict definition of luck (anything outside one's control), most of the 60–90% "initial conditions" share is also luck. On a looser definition (luck = only post-entry shocks), luck is about 35–40% of lifetime earnings variation. Which definition is "right" is a philosophical choice, not an empirical one.

3.5 Natural experiments: the causal effect of pure luck

- **Job loss.** Davis & von Wachter (2011), "Recessions and the Costs of Job Loss," Brookings Papers on Economic Activity (Fall), use Social Security records from 1974–2008. Men displaced in mass layoffs lose an average of 1.4 years of pre-displacement earnings in present value when national unemployment is below 6%, and "a staggering 2.8 years" when it exceeds 8% (20-year horizon, 5% discount rate). brookings
- **Graduating in a recession.** Oreopoulos, von Wachter & Heisz (2012), "The Short- and Long-Term Career Effects of Graduating in a Recession," AEJ: Applied 4(1):1–29 (DOI 10.1257/app.4.1.1), use Canadian data. "Unlucky graduates suffer persistent earnings declines lasting ten years." aeaweb Losses are larger and more persistent for less advantaged graduates, so luck interacts with initial endowments. nber
- **Health.** Dobkin, Finkelstein, Kluender & Notowidigdo (2018), "The Economic Consequences of Hospital Admissions," AER 108(2) (DOI 10.1257/aer.20161038), find that for insured adults aged 50–59, a hospital admission is followed by an 11-percentage-point drop in employment. Annual earnings fall by $8,753 on average over three years, about 20% of pre-admission earnings, and the decline is persistent. mit
- **Windfalls and work.** Cesarini, Lindqvist, Notowidigdo & Östling (2017), "The Effect of Wealth on Individual and Household Labor Supply," AER, find that among Swedish lottery players, winning modestly reduces pre-tax labour earnings by about 1% of the prize per year, immediately and persistently. aeaweb
- **Windfalls and firm creation.** Bermejo, Ferreira, Wolfenzon & Zambrana (Nova SBE WP 651, 2022; CEPR DP 14638) study the Spanish Christmas Lottery, in which about 75% of Spaniards play and about 0.3% of GDP is at stake. Lottery prizes raise firm creation, startup job creation and self-employment, especially where access to finance is poor. Firms created in winning provinces are larger, more profitable and survive longer. unl researchgate Who becomes an entrepreneur, and how well their firm does, depends partly on random access to capital.

3.6 Perception and bias

- **Self-serving attribution.** Mezulis, Abramson, Hyde & Hankin (2004), "Is there a universal positivity bias in attributions?," Psychological Bulletin 130(5):711–747 (DOI 10.1037/0033-2909.130.5.711), meta-analyse 266 studies (503 effect sizes). The average d is 0.96, a very large effect: people attribute successes to themselves and failures to circumstances. semanticscholar Substack The abstract reports that "Asian samples displayed significantly smaller biases (d = 0.30) than US (d = 1.05) or Western (d = 0.70) samples." The bias was smallest in samples with depression (d = 0.21).
- **Survivorship and selection bias.** Studying only surviving or successful firms hides the many who did the same things and failed. Given about 50% five-year establishment exit and about 75% zero-value founder exits, success-only samples are badly unrepresentative. Denrell's work on selective sampling (e.g., Denrell & Kovács 2008, Administrative Science Quarterly) formalises this problem. google
- **Reverse bias.** The perception of skill can itself create persistence (Gompers et al. 2010). qcconference Persistence therefore overstates "pure" skill.

3.7 The strongest arguments on each side

For a large role of luck:

- Outcome distributions are extremely skewed.
- Experts cannot predict winners (correlation about 0.1).
- Persistence is modest.
- Random early advantages compound (field experiments).
- Natural experiments show large, lasting effects of unchosen shocks.
- Much of "talent" comes from genes, family and birth timing.

For a large role of skill and effort:

- Measurable persistence exists among serial founders and VC funds.
- Experience and age predict high growth.
- Specific traits predict both who enters and who earns more.
- Initial human capital, which is partly built through effort, dominates lifetime-earnings variation in structural models.
- Under the "multiplicative" logic of the luck models, a small skill edge applied over many trials and decades compounds into large expected differences, even if any single outcome is noisy.

Both sides are right about different measures. The disagreement is mainly about definitions and which outcome is studied.

4. Evidence-Based Parameter Ranges for Simulation

Parameter	Evidence-based range	Source	Evidence quality
Share of lifetime-earnings variance due to conditions at career start	54–66% (shocks 34–46%)	Huggett, Ventura & Yaron 2011, AER	Medium (model-dependent)
Same, measured at age 16, lifetime utility	~90% (shocks ~10%)	Keane & Wolpin 1997, JPE (as summarised by Todd & Zhang 2020, Quantitative Economics)	Medium-low
Annual earnings-change distribution	Strongly negatively skewed; kurtosis ~10–30 (Gaussian = 3); most years near-zero change, rare large jumps	Guvenen et al. 2021, Econometrica	High
Persistence of positive vs negative shocks	High earners: positive shocks transitory, negative persistent; reverse for low earners	Guvenen et al. 2021	High
Size of mass-layoff job loss	PV loss of 1.4 (unemployment <6%) to 2.8 (>8%) years of prior earnings	Davis & von Wachter 2011, BPEA	High
Size of entering labour market in recession	Persistent losses fading over ~8–10 years; larger for less advantaged	Oreopoulos, von Wachter & Heisz 2012	High
Size of health shock (hospitalisation, age 50–59, insured)	−11 pp employment; ~−20% annual earnings, persistent	Dobkin et al. 2018, AER	High mit
Frequency of major negative events (displacement, health shocks) per career	**No good direct estimate gathered here**; Guvenen et al. show large heterogeneity in years nonemployed between ages 25–55	—	Gap

Parameter	Evidence-based range	Source	Evidence quality
Frequency of major positive career events	**No good direct evidence**; heavy right tail in earnings changes implies rare large positive jumps	Guvenen et al. 2021 (indirect)	Gap
New-business survival	1 yr ~80%; 5 yr ~50% (range 45–52% across cohorts since 1994); 10 yr ~35%	BLS Business Employment Dynamics (via secondary tabulations)	High (verify against BLS tables)
Industry spread in 5-yr survival	~47% (information) to ~62% (retail)	BLS BED via secondary tabulation	Medium
VC-backed founder exit payoff	~73–75% receive zero; mean ~$5.8M; heavy right tail to >$1B	Hall & Woodward 2010, AER	High
VC investment outcomes	~55% terminated at a loss; ~6% return >5x and supply roughly half of returns	Kerr, Nanda & Rhodes-Kropf 2014, JEP	High researchgate
Skill effect on venture success (track record)	Success 30% (prior success) vs 18% (first-time) in NBER WP 12592; 21% for first-timers and 22% for prior failures in the published JFE version	Gompers et al. 2006/2010	Medium-high
Ex-ante predictability of venture returns by experts	Correlation ~0.1	Kerr, Nanda & Rhodes-Kropf 2014	Medium (one firm) harvard
Self-employment earnings vs paid work	Median −35% after 10 yrs (all self-employed); incorporated ~+18% residual hourly	Hamilton 2000; Levine & Rubinstein 2017	Medium (definitions differ) nyu
Talent → ability to convert luck (TvL rule)	Model assumption only (P = talent); outputs vary >50% across identical runs	Pluchino et al. 2018; Elvidge 2020	Low (uncalibrated)

Parameter	Evidence-based range	Source	Evidence quality
Effect of windfall on labour earnings	~−1% of prize per year, persistent	Cesarini et al. 2017, AER	High aeaweb
Heritability of entering entrepreneurship	37–42%	Nicolaou et al. 2008, Mgmt Sci	Medium

Simulation guidance (my interpretation):

- Model annual wage income as a persistent individual component plus non-Gaussian shocks: mostly small changes, with rare large ones (a normal mixture fits this).
- Model entrepreneurial payoffs as a separate, heavy-tailed lottery with a zero-inflated mass of about 75% (for VC-backed ventures).
- Let skill shift the probability of success modestly, for example by a factor of about 1.5–1.7 for strong vs average, rather than determine it.
- Calibrate so that persistent factors explain about 55–65% of lifetime earnings variance.

5. Conclusions and Practical Implications

1. **Luck's share rises with the extremity and path-dependence of the outcome.** Confidence: high. This is consistent across distributional data, persistence studies, field experiments and theory.
2. **For lifetime earnings, about 55–65% of variation reflects pre-career differences and about 35–45% reflects later shocks.** Confidence: medium. It rests on structural models with contestable assumptions, and alternative models range up to 90/10.
3. **For any single venture's success, persistent founder factors explain only a minority of variation. Venture-specific chance and timing dominate.** Confidence: medium. This is inferred from modest persistence (30% vs 18–21%) and low expert predictability ($r \approx 0.1$). The exact share is not directly estimated in the literature I reviewed.
4. **Skill is real, cumulative and partly learnable (industry experience, age, track record).** Confidence: high.
5. **The strict-sense luck share (counting genes, family and birth timing as luck) is larger than any of these figures.** Confidence: medium. Heritability and initial-condition estimates support it, but the boundary is definitional.
6. **People overattribute success to themselves.** Confidence: high (large meta-analysis).

Practical implications:

- **For individuals.** Your skill raises your odds; it does not set your outcome. Maximise the number of independent "shots" and survive bad draws: keep savings buffers, avoid ruin, and give priority to industry experience before founding. Judge decisions by process, not by outcomes.

- **For investors and evaluators.** Discount extreme track records. The second tier can be a better skill signal (Denrell & Liu). sciencedaily Use base rates of about 50% five-year survival and about 75% zero founder payoff.
- **For policy.** Because large, unchosen shocks (layoffs in recessions, health events, graduating into a downturn) have lasting effects, insurance against them has strong justification. Windfall evidence shows that access to capital changes who becomes an entrepreneur.

6. Limitations and Open Questions

- **No direct measurement of luck.** All estimates are residuals or model-based. Persistence tests confound skill with persistent non-skill advantages such as wealth, networks and reputation, and with perceived skill.
- **Definitional dependence.** Whether genes and upbringing count as luck changes the answer from about 35% to well over half.
- **Data gaps.** I found no good direct evidence on how often major positive career events occur, and I did not gather direct estimates of displacement or health-shock frequency per career. These are flagged as gaps in the table.
- **Geographic concentration.** Most evidence is U.S.-based, with some Canadian, Swedish, Spanish and UK data. Cross-country comparisons of the luck share are largely missing.
- **Time variation.** VC buyout persistence weakened after 2000, which suggests the skill share can change as markets mature. researchgate
- **Secondary-source reliance.** BLS survival figures come from third-party tabulations of BLS Business Employment Dynamics Table 7 and should be verified against the BLS original. The Gompers first-timer success rate differs between versions: 18% in NBER WP 12592 and 21% in the published JFE paper. The Keane & Wolpin 90% figure is taken from Todd & Zhang's (2020) summary, not the original JPE text.
- **Toy models.** The Talent vs Luck model has been influential (including an Ig Nobel prize) but is uncalibrated and parameter-sensitive. csh It should not be cited as an empirical estimate.
- **Open questions:**
  - Can the latent-skill share in venture success be estimated directly, for example with Bayesian models on serial-founder panels?
  - How do platform economies, with stronger rich-get-richer dynamics, change the luck share?
  - How large are the long-run effects of positive shocks compared with negative ones?

Note on sources: each source is identified inline by author, year, title, venue and DOI where available. Secondary sources (strategy+business summaries, BLS tabulations by third parties, blog and GitHub replications of the TvL model, and textbook summaries of Mezulis et al.) are labelled as such in the text.