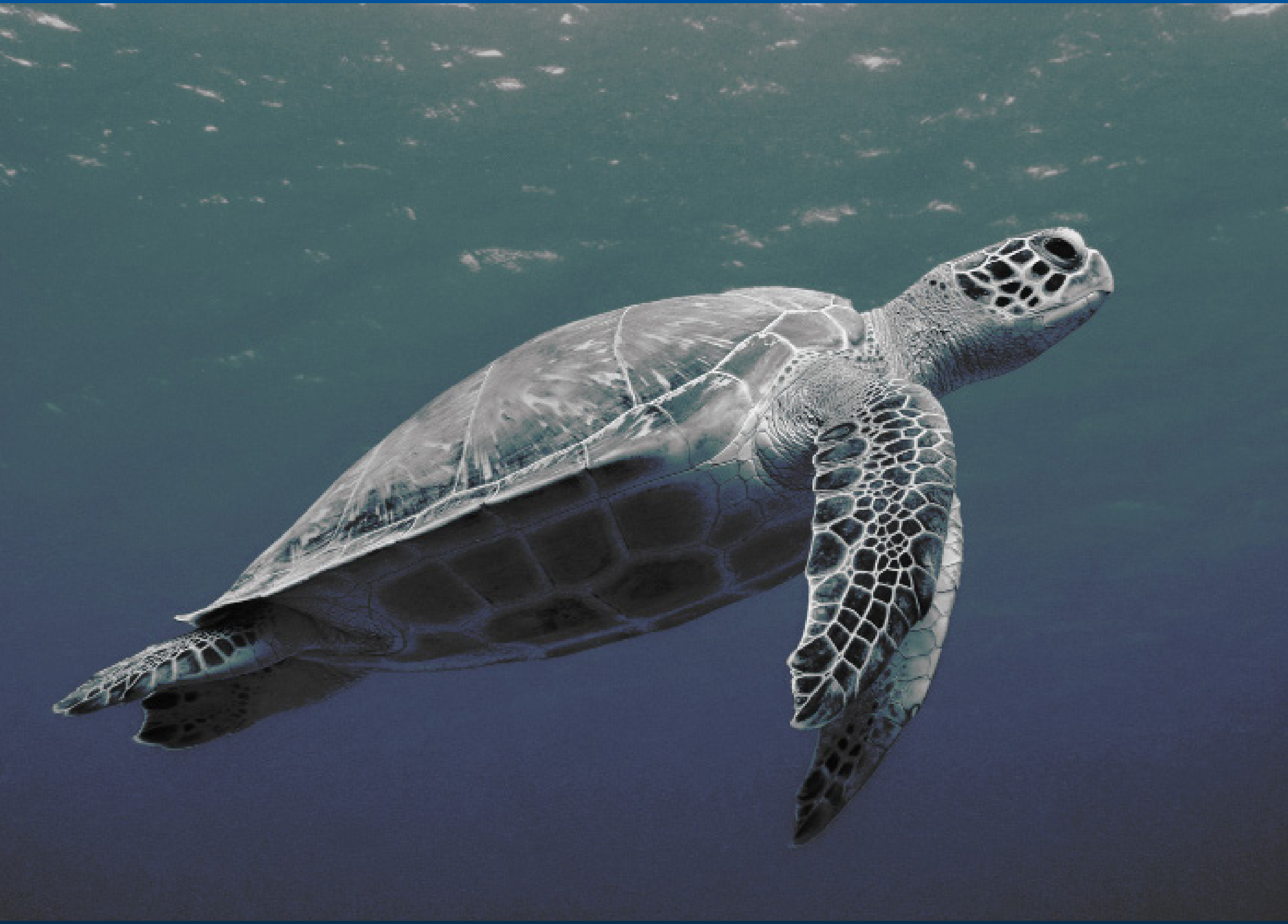
ALUMNI VENTURES GROUP



WHITE PAPER REPORT

How Many Eggs in a Venture Capitalist's Dozen?

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EXECUTIVE SUMMARY

SINCE ITS FOUNDING IN 2014, Alumni Ventures Group has been dedicated to opening up the venture industry to many more accredited investors. We believe that investing in VC can give investors access to the most entrepreneurial (and therefore higher-growth) segments of the economy. However, investing intelligently in venture requires a very large portfolio to minimize the risk of loss and maximize the odds for outsized returns. We'll show how the strategy of making many bets and spreading them widely is the surest way to thrive in venture investing.

QUANTITY + DIVERSITY = SURVIVAL

Every summer, from about May to September, nesting female sea turtles emerge from the water to lay their eggs. Of the ~1,000 eggs laid, 20% won't hatch. Those that do must face the perils of crawling to the water, which include predatory crabs and birds along with deadly crashing waves. Only 50% will make it to the sea. Those that reach it face continued dangers: reef sharks, dolphins, and fish in the shallows and scores of additional predators in deeper waters. Ultimately, only 20 turtles — just two percent — of the total eggs laid will survive.[1]

The plight of the sea turtle is analogous with venture capital, where startups face many obstacles to survive. The U.S. Department of Labor estimates that the survival rate for small businesses is 80% after one year, is roughly 50% after five years, and falls rapidly to 20% as time elapses.[2]

While the odds against sea turtles might seem insurmountable, they have roots dating back to the dinosaurs about 150 million years ago. This is largely thanks to the diversification and number of

> The plight of the sea turtle is analogous with venture capital, where startups have a minute chance of survival.

1 https://www.youtube.1 com/watch?v=MB5p2B3ytHw
2 https://www.toptal.com/finance/venture-capital-consultants/venture-capital-portfolio-strategy

investments (eggs laid), which decreases their overall risk (extinction) and increases their return (breeding & proliferation). This same principle can be applied to investing. A diverse and large N (number of investments) can help investors withstand the test of time by reducing risk and garnering outsized returns.

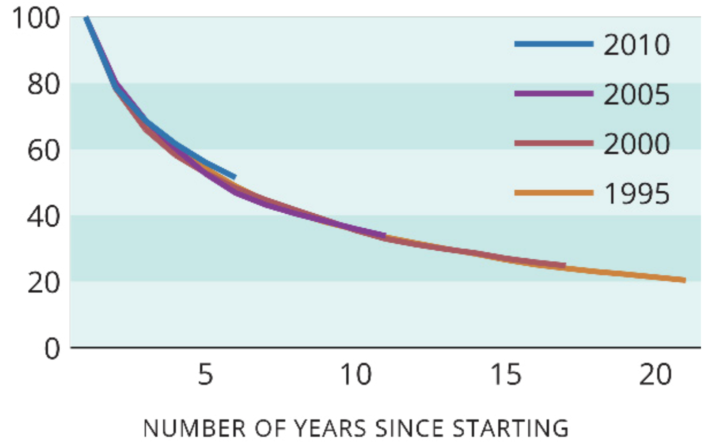
The survival of the sea turtle is just one example of diversification and large-N principles. As documented by Darwin, these are pillars of evolutionary history — specifically, biological bet hedging — and are why we all exist today.[3] Moreover, dating back to ancient times (~2000 B.C.), humans practiced diversification principles as merchants traveling dangerous waters would split their goods across many vessels to limit the loss due to any single ship failing.[4] We still see this today with farmers planting multiple types of crops to spread the risk of a specific harvest having a bad season and overplanting to minimize loss. Everyone reading this paper likely uses a form of risk mitigation via large-N diversification through insurance.[5] Furthermore, we also likely applied to more than one school or job to increase our chances of acceptance.

INVESTING IN VENTURE: THINK BIG

Principles of diversification are also a hallmark of investing. Modern portfolio theory relies on having a large enough N to diversify. This contributes to lower standard deviation and impact of outliers, reducing volatility and risk, while improving the average rate of return.[6] Diversification improves a portfolio's risk/reward profile.[7]

This applies to the economics of venture capital as well. A Correlation Ventures study of over 20,000 investments (from 2004-2013) showed that 65% of venture capital deals returned less than the original principal. This was

Survival Rates of Startups

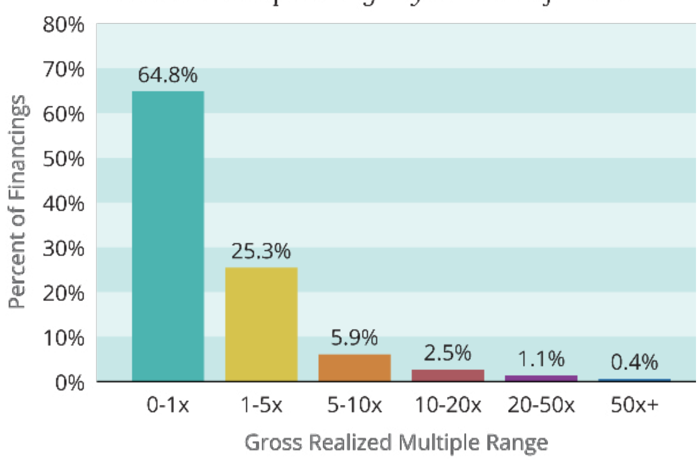


Source: Bureau of Labor Statistics, Business Employment Dynamics

> Diversification improves a portfolio's risk/reward profile.

Diversification cannot ensure a profit or protect against loss in a declining market. It is a strategy used to help mitigate risk

Realized Multiple Range by Percent of Total

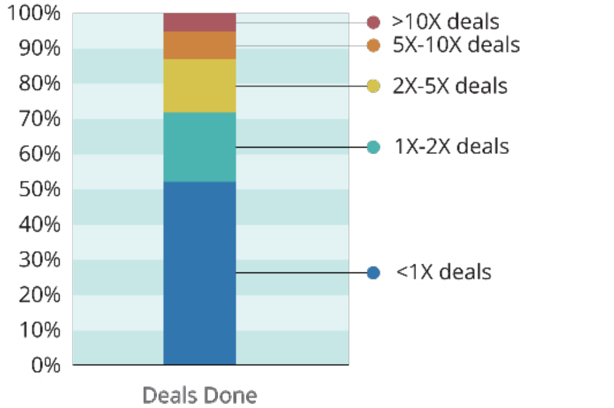


Data Source: *Correlation Ventures*

3 https://en.wikipedia.org/wiki/Bet_hedging_(biology) and https://www.researchgate.net/publication/318502138_The_Origin_of_Diversification_An_Evolutionary_Theory
4 https://en.wikipedia.org/wiki/History_of_insurance
5 https://www.investopedia.com/articles/08/history-of-insurance.asp
6 https://www.forbes.com/sites/davidmarotta/2012/04/16/asset-allocation-and-the-efficient-frontier/#483005d33e7b
7 http://www.moneychimp.com/articles/risk/efficient_frontier.htm

corroborated by a similar analysis of over 7,000 investments (from 1975 to 2014) by Horsley Bridge.[8]

U.S. Venture Investments by Return Range



Data Source: *Horsley Bridge*

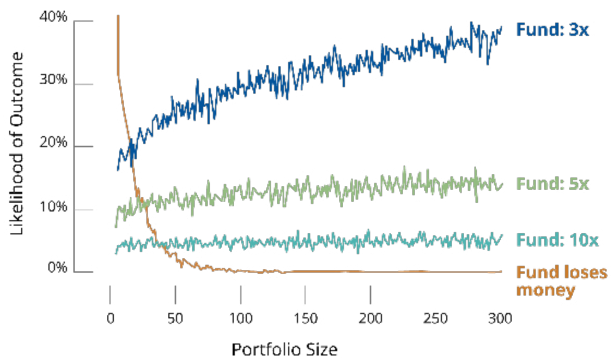
As seen in the graphs from each study, venture investments follow a power law distribution where an outcome's likelihood is inversely proportional to its size. "With a power law distribution of returns, success is all about hitting that rare outlier. Other things being equal, the more chances you have, the greater the chance of a big hit."[9]

Therefore, a more prudent VC investment strategy would be to construct a portfolio size based on the number of investments required to generate several big outcomes. For more on the economics of venture capital, please refer to our other publications.

Venture Capital fund and accelerator 500 Startups perhaps stated it best:

"Most VC funds are far too concentrated. ... The industry would be better served by doubling or tripling the average number of investments in a portfolio, particularly for early-stage investors where start-up attrition is even greater. If unicorns happen only 1%–2% of the time, it logically follows that portfolio size should include a minimum of 50 ... companies in order to have a reasonable shot at capturing these elusive and mythical creatures."[10]

Simulated Performance by Portfolio Size



Source: Steve Crossan, "Modelling suggests rational venture investors should have bigger portfolios"

Similarly, Steve Crossan took 10,000 company returns to simulate 1,000 portfolios at sizes ranging between five and 300 investments using Monte Carlo Simulation. This shows the effect of portfolio size (N) on the chances of failing (returning < 1x) and achieving outsized returns (3x or more).

As shown in the graph, with just five investments in the portfolio, there is an over 40% chance of losing money. This falls dramatically until portfolios reach 50 investments, where there is minimal chance of loss. Moreover,

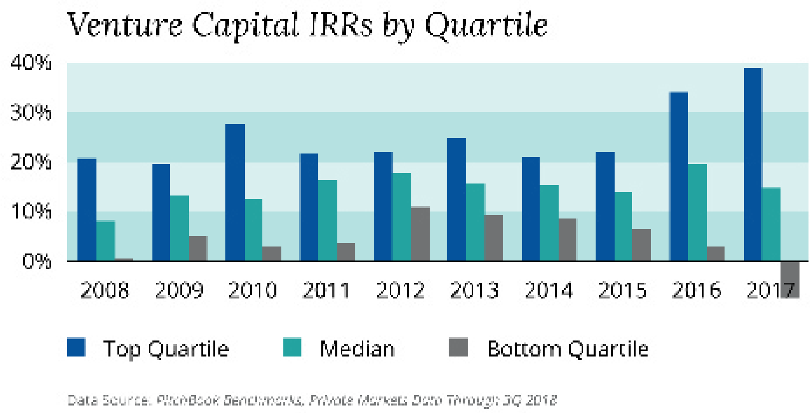
8 https://www.toptal.com/finance/venture-capital-consultants/venture-capital-portfolio-strategy
9 https://medium.com/unreasonable-effectiveness/rational-venture-investors-should-have-bigger-portfolios-c9ea2ff4589
10 https://500hats.com/99-vc-problems-but-a-batch-ain-t-one-why-portfolio-size-matters-for-returns-16cf556d4af0

the odds for outsized returns increases as portfolio size grows. Thus, having at least 50 investments in the portfolio improves the likely performance.[11]

It's not just the number of investments, but the diversification that leads to lower risk and better returns.

Of course, there are exceptions and caveats to these findings. Statistics alone cannot ensure a low-risk and high-return portfolio. One such limitation is that increasing portfolio size usually will limit the maximum return. As the number of investments grows, the overall portfolio value must increase to produce the same rate of return, and generating a high ROI at larger scale is harder.[12]

Furthermore, linking back to modern portfolio theory, it's not just the number of investments, but the diversification that leads to lower risk and better returns. Investing across industries (e.g., Healthcare, FinTech, Robotics), stages (e.g., seed, Series A, Series B), geographies, and time can contribute to more successful portfolios. For more on the benefits of diversification in portfolio construction, please refer to our other publications.



Additionally, venture capital is both a science and an art. The art can be hard to quantify as investors offer strategic value, provide extensive networks, give operational guidance, advise as board members, leverage specialized experience, and contribute follow-on capital. Given the extent of these value-add contributions, only a small set of venture capital funds end up providing the large majority of returns. The justifiable conclusion is that co-investing with only the top-tier investors would further increase investment success — and indeed there is evidence to prove that logic.[13] See the chart above and our other publications.

11 https://medium.com/unreasonable-effectiveness/rational-venture-investors-should-have-bigger-portfolios-c9ea2ff4589
12 https://blog.usejournal.com/diversification-in-venture-portfolio-construction-8bb7980e7ea1
13 https://techcrunch.com/2017/06/01/the-meeting-that-showed-me-the-truth-about-vcs/ and https://www.saastr.com/why-only-12-of-vcs-can-be-considered-successful-max/

For more information on Alumni Ventures Group and our comprehensive approach to venture investing, please reach out to Investor.Relations@AVGFunds.com.

CONCLUSION: OPTIMIZING ODDS FOR A VENTURE WIN

In closing, we will note that while venture capital is a high-risk asset class, numerous studies suggest that a large and diverse portfolio generates the greatest chance of reducing risk and increasing returns. This minimizes the risk of bad investments ruining the entire portfolio and increases returns by finding outsized winners. Investors should seek to construct a portfolio of 50 or more investments spanning sector, stage, geography, lead investor, and vintage.

BUILDING YOUR VENTURE NEST EGG

50+

Ideal number of deals in a portfolio

Diversity

By stage, sector, region, co-investors, and vintage

Experienced VCs

Co-invest with established venture firms

ABOUT THE AUTHOR

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Cainon has 10+ years of experience in finance, venture capital, and entrepreneurship, having worked at Boston Consulting Group and PBM Capital Group and served on the founding teams of five startups. At BCG, he worked in their private equity practice to conduct due diligence across the semiconductor, transportation, and medical device industries. At PBM (a $500 million healthcare-focused venture capital firm), he led investments and worked as an operating partner within portfolio companies (including Human Design Medical, Revive Pharmaceuticals, and Triangle Research Labs). Cainon is a Co-Founder and advisor of Viafy and was previously a Co-Founder and CEO of University Laundry (acquired by a national operator and now part of Proctor & Gamble's marquee Tide brand). He has an MBA from MIT Sloan and a BS from the University of Virginia in Systems Engineering.