INNOVATORIUM
Technologies Corporation

How to Invest Like a Venture Capitalist

The investment schedule in independent projects can make a huge difference

Cristian Vava, PhD*

•CEO of Innovatorium Technologies Corporation, Your Special Analytics Department

I'm not a VC, why should I care about it?

- Many forms of repetitive investments follow the rules of chained low probability events: R&D, start-ups, playing lottery. Other applications may encompass series of unlikely events as economic crisis or consecutive failure of multiple defense layers.
- By controlling the investment schedule the investor is able to maximize gains maintaining an acceptable risk level or better understand the risk associated with the desired profit.
- In this study we'll assume completely independent events sharing the source of funding.

Simulation Conditions

- The overall initial investment is an arbitrarily chosen value of $10.
- There are 10 projects available to invest in.
- All investments have the same profitability probability with an uniform distribution of 10% (on average one out of ten projects is profitable all others lose the entire investment).
- The profit of a successful project is equal to the product between the investment and an arbitrary chosen value of 10 (each $1 invested generates $10).

How to Do It

- Common methods use simulations; measuring the effect of 0.00000001% probability events requires billions of samples and the evaluation of risk involves tedious stochastic integrals.

- Since each project could have only two outcomes (Success / Fail) ten projects will generate 1024 possible combinations.
- With a discrete number of possibilities we'll analyze outcomes individually and compute probabilities using Lebesgue integrals (simple conditional sums for empirical distributions).
- This method could be used for any distribution including empirical ones while being intrinsically stable, more accurate, and orders of magnitude faster than traditional simulations.

Schedule 1

Investment Terms

- Invest same amount in each project ($1 per project).

Profits

- Maximum profit of $100 (all projects are profitable) with 0.00000001% probability.
- Minimum profit of $0 (no project is profitable) with 34.9% probability.
- Average profit is $10, equal to the initial investment.

Table 1. Most profitable project - Schedule 1

Project Number	Schedule	Investment per Project	Cash available
1	1	$1.00	$19.00
2	1	$1.00	$28.00
3	1	$1.00	$37.00
4	1	$1.00	$46.00
5	1	$1.00	$55.00
6	1	$1.00	$64.00
7	1	$1.00	$73.00
8	1	$1.00	$82.00
9	1	$1.00	$91.00
10	1	$1.00	**$100.00**

Schedule 2

Investment Terms

- Invest in each project 10% of all cash available at the time of investment.

Profits

- Maximum profit of $6,131 (all projects are profitable) with 0.00000001% probability.
- Minimum profit of $3.49 (no project is profitable) with 34.9% probability.
- Average profit is $10, equal to the initial investment.

Table 2. Most profitable project - Schedule 2

Project Number	Schedule	Investment per Project	Cash available
1	1	$1.00	$19.00
2	1	$1.90	$36.10
3	1	$3.61	$68.59
4	1	$6.86	$130.32
5	1	$13.03	$247.61
6	1	$24.76	$470.46
7	1	$47.05	$893.87
8	1	$89.39	$1698.36
9	1	$169.84	$3226.88
10	1	$322.69	**$6,131**

Schedule 3

Investment Terms

- Invest in each project a part of the available cash decreasing with the rate given by Schedule (increasingly conservative).

Profits

- Maximum profit of $17,361,688 (all projects are profitable) with 0.00000001% probability.
- Minimum profit of $0.00 (no project is profitable) with 34.9% probability.
- Average profit is $10, equal to the initial investment.

Table 3. Most profitable project - Schedule 3

Project Number	Schedule	Investment per Project	Cash available
1	10	$1.00	$19.00
2	9	$17.10	$172.90
3	8	$138.32	$1417.78
4	7	$992.45	$10349.79
5	6	$6209.88	$66238.68
6	5	$33119.34	$364312.75
7	4	$145725.10	$1675838.64
8	3	$502751.59	$6200602.98
9	2	$1240120.60	$17361688.36
10	1	$1736168.84	**$17,361,688**

Schedule 4

Investment Terms

- Invest in each project a part of the available cash increasing with the rate given by Schedule (increasingly optimistic).

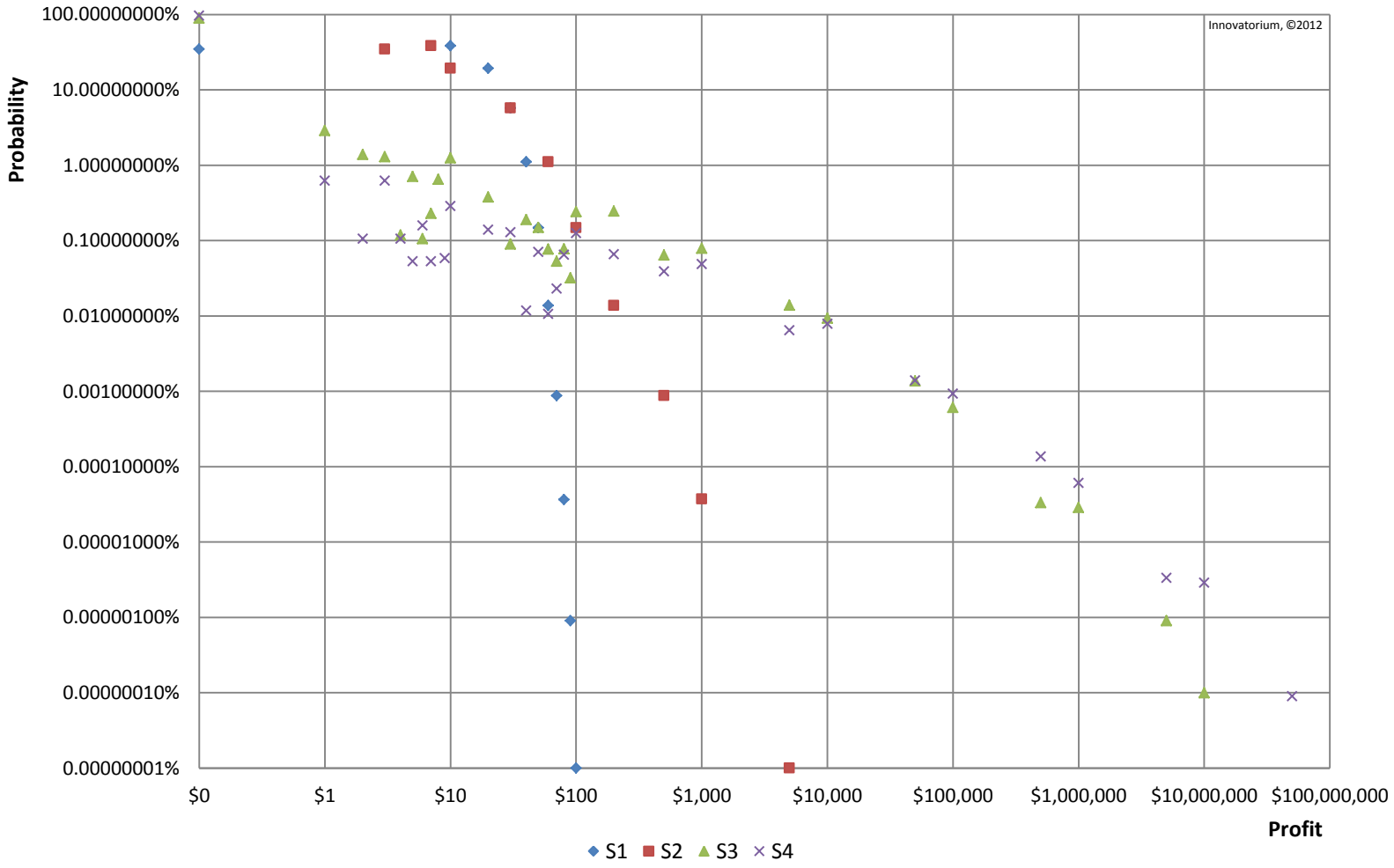
Profits

- Maximum profit of $173,616,884 (all projects are profitable) with 0.00000001% probability.
- Minimum profit of $0.004 (no project is profitable) with 34.9% probability.
- Average profit is $10, equal to the initial investment.

Table 3. Most profitable project - Schedule 4

Project Number	Schedule	Investment per Project	Cash available
1	1	$1.00	$19.00
2	2	$3.80	$53.20
3	3	$15.96	$196.84
4	4	$78.74	$905.46
5	5	$452.73	$4980.05
6	6	$2988.03	$31872.33
7	7	$22310.63	$232668.03
8	8	$186134.42	$1907877.84
9	9	$1717090.06	$17361688.36
10	10	$17361688.36	**$173,616,884**

Distribution of Profits



Conclusions

- By properly selecting the investment schedule an investor can match the potential gain with a personally acceptable risk level
- The four proposed schedules generate exponentially growing gains with similarly high risks.

Profit under	S1	S2	S3	S4
$10	34.87%	73.61%	97.04%	98.37%
$100	65.13%	26.23%	2.31%	0.74%
$1,000	0.00%	0.16%	0.63%	0.28%
Maximum Profit	$100	$6,131	$17,361,688	$173,616,884

- Computation of discrete events with very low probability using point calculation and Lebesgue integrals is intrinsically stable, more accurate, and orders of magnitude faster than simulations based on stochastic integrals.

Contact Information

Web: www.innovatt.com;
www.heuristicanalytics.com

Email: bd @ innovatt.com

Phone: +1-267- 342-2815

Legal Disclaimer

Under no circumstances but not limited to negligence, shall Innovatorium Technologies Corporation be liable for any direct, indirect, special, incidental or consequential damages whatsoever that result from the use of information presented in this white paper, unless that information is subsequently confirmed in writing as part of a legally binding contract.

The information presented in this white paper cannot and do not address the unique facts and circumstances of your specific situation and should not be relied on for your particular applications. Therefore, you should not use this information without first contacting Innovatorium Technologies Corporation (www.innovatt.com).