Fostering VC-Funded Innovation

By Bart Stuck and Michael Weingarten

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In recent articles on innovation,[1] we expressed concern that VCs are funding surprisingly little important new technology. Instead, we're seeing the same type of incrementalism highlighted in The Innovator's Dilemma, a behavior attributed in that book to established corporations who have a lot to lose from disruptive technologies. One would have thought that VCs, who have nothing to lose and a lot to gain, would be more supportive of new technology. Unfortunately, as we highlighted in the articles, we believe that structural problems with normal VC funds make true innovation problematic.

The Solution?
If the source of the problem is structural, we need to look to structural solutions for the answer.

In particular, what we think we need is a new kind of fund focused on developing important new technologies, as opposed to conventional VCs funding incremental improvements to established technologies. Just as the industry has for many years distinguished between early stage and late-stage VCs (allowing major private equity investors to invest in a balanced package of funds), so **there should be special venture funds focused exclusively on high-innovation opportunities**.

As we pointed out in "Innovation and Profitability," high-innovation investments will not necessarily result in low returns. Just the reverse. So such a fund could foster innovation and be profitable at the same time.

Naming the Fund
What to call such a fund? In "Death of Innovation Revisited," we established a ranking methodology for assessing the degree of technological innovation, using a 1-5 scale:

- We reserved our highest rank (T1) for new technologies representing a fundamental departure from anything existing previously, and whose commercialization made possible an entirely new (and important) business market. A good example is the invention of xerography.

- Moving down one notch, we ranked a company as T2 if it was able to demonstrate fundamental technology improvement in an existing product category. These include

[1] "Death of Innovation" (Revisited);" "Innovation and Profitability;" "Innovation and Investment;" "Innovation and Life Cycle;" "VCs and Innovation"

Clay Christensen's 'disruptive technologies;' i.e., new technologies that supplanted old technologies in already-established markets, rather than creating new markets.

- Our T3 designation was reserved for companies able to demonstrate non-trivial technical improvements in existing product categories. However, the nature of the improvement was largely one of extending existing technologies (i.e., by using ASICs with .13 rather than .18 nm traces). The result of T3 innovations could well be the next Moore's Law jump in speed/computing capability. However, we see these as obvious (if non-trivial) serial extensions in existing technologies rather than truly disruptive innovations. We also tend to see T3 improvements as substantially less defensible long term than T1s or T2s (unless first mover advantage results in long-term customer lock-in). After all, a first-mover Moore's Law announcement by Player A invariably is matched within months by Players B, C and so on.

- Our T4 designation was used for companies able to demonstrate modest improvement in existing technologies, perhaps by repackaging a combination of already-commercialized technologies in novel ways. In many ways, T4 is like T3 but with less significant improvement over what came beforehand.

- Our T5 designation was used for companies who did not create new technology, but were able to successfully market existing technology. Alternatively, companies developing *new business models* using well-established Internet technologies (i.e., EBay or Amazon) would receive T5 designations.

Since the top two rankings clearly reflect important new innovation, we have decided to call our prototypical high-innovation fund the T1/T2 Fund, or "T12F."

Key T12F Elements
Our idealized T12F would look something like this:

1. **Investment Portfolio:** T12F would invest in 10-15 different investment opportunities, beginning with seed and Series A investments. It would continue to invest in portfolio companies so long as they are making acceptable progress against defined milestones. Companies not making acceptable progress will be pruned.

   By the end of the fund, there may only be 1-3 companies remaining in the portfolio, with each of these making clear progress toward major success status.

2. **Degree of Diversification:** As the fund matures, there will be low diversification by normal VC fund standards – since the odds of developing multiple major successes in a single fund are low. Institutional investors will need to obtain diversification by investing in other funds.

3. **Fund Life Cycle Focus:** As a result, T12F would start as an early stage fund, but evolve over time into a late stage fund. Fund II, III, etc., would continue the cycle with new portfolio opportunities, so that the T12F general partner would continue to look for major opportunities at any point in time.

4. **Fund Life:** Given the sole focus on major opportunities, it may take longer than the normal 2-3 years to be fully invested. Also, since it may take 3-5 years for a T12F company to have commercialized product, the fund life needs to be longer than the normal 6-7 year VC fund. We think 10-12 years may be needed.

5. **Fund Size and Reserves:** Given that T12F will need to be able to reinvest in multiple successive rounds of successful portfolio companies and to sustain 10-12 years of operations, the fund will need to be at least $50M - $100M in size.

6. **Round Leader:** Given that T12F by definition will be looking to invest in major opportunities that other funds may be overlooking, in most instances, T12F must be prepared to lead or co-lead each round.

7. **Market Size Hurdle Rate:** The market opportunity must be at least $1B annually, with company revenues of $500M annually.

8. **Competitive Advantage:** The market opportunity must have significant competitive advantage, and hopefully few competitors. This means that the T12F will not be investing in 'fashionable' companies, unless the investment candidate has a clear path to market share leadership based on superior technology (not simply based on the prospect of superior execution).

9. **Links with Labs:** Most VCs emphasize close contacts with serial entrepreneurs, and they develop business plans around a core seasoned business team.

   For T12F, the key source of business deals must be the (remaining) corporate research labs and university labs, since this is where the fundamental research continues to take place. As Willie Sutton used to say about why he robbed banks, "Because that's where the money is."

   There are two problems with a lab-centric approach, however, that we deal with below:

   - A lot of research is not ready for prime time. Some technologies take years or even decades to mature, and require fundamental advances in multiple disciplines before commercialization is possible. In dealing with labs, one needs to be able to distinguish between 'ready for prime time' and 'science project.'

   - Researchers are not business people. They don't know how to run businesses.

10. **Need In-Depth Technical (as well as Business) Expertise:** T12F needs the ability to distinguish between science projects and technologies whose time has come and can be commercialized. This means having GP members with technical degrees in relevant areas who can communicate effectively with researchers, and understand the technical issues without over-filtering.

    It also means having people who understand the business side and can make appropriate business decisions. Indeed, until a professional business team can be recruited, the VC effectively IS the business talent.

11. **Higher Investment Multiple:** T12F portfolio companies must have substantially higher investment multiple potential than seen in normal VC fund investments.

    For the overall VC industry, the 20-year IRR (as of Q2 2003) was 16.1%. Most VCs use the '10x your money in five years' standard, which is equivalent to a 58% IRR. That's wishful thinking except for the successes. In a portfolio of 10 companies, if you have one investment with a 10x return, four with a 2x return, three with breakeven returns and two complete write-offs, you have a weight-averaged 16.0%% IRR, which is close to the 20 year average (Table 1). So even in a 'normal' VC, most portfolio companies don't generate great returns.

Table 1
Pro Forma Standard VC Fund

	Per Company: Investments with 10x Return	Per Company: Investments with 2x Return	Per Company: Investments with 1x Return	Per Company: Investments with 100% Write-off	Total Investments
Number of companies	**1**	**4**	**3**	**2**	**10**
Yr 0	-100	-100	-100	-100	**-1000**
Yr 1	0	0	0	0	**0**
Yr 2	0	0	0	0	**0**
Yr 3	0	0	0	0	**0**
Yr 4	0	0	0	0	**0**
Yr 5	1000	200	100	0	**2100**
IRR	**58%**	**15%**	**0%**	**N/A**	**16.0%**

In contrast, a T12F relying on one company that might not go liquid for 10 years with only one success (with the other deals resulting in 100% write-offs) needs investment opportunities that generate something like a 44x return in 10 years on a single big success (along with 2 breakeven deals and 7 complete write-offs), to generate the same 16% overall IRR (Table 2). This means that T12F needs to look not simply at companies with new technologies, but companies with technologies that have the possibility of creating a significant new industry (T1s) or which can transform a major pre-existing industry (T2s). The fund by definition must go after elephants, not one or two baggers.

Table 2
Pro Forma T12F Fund

	Per Company: Investments with 10x Return	Per Company: Investments with 2x Return	Per Company: Investments with 1x Return	Per Company: Investments with 100% Write-off	Total Investments
Number of companies	**1**	**0**	**2**	**7**	**10**
Yr 0	-100	-100	-100	-100	-1000
Yr 1	0	0	0	0	**0**
Yr 2	0	0	0	0	**0**
Yr 3	0	0	0	0	**0**
Yr 4	0	0	0	0	**0**
Yr 5	0	0	0	0	**0**
Yr 6	0	0	0	0	**0**
Yr 7	0	0	0	0	**0**
Yr 8	0	0	0	0	**0**
Yr 9	0	0	0	0	**0**
Yr 10	4400	200	100	0	**4400**
IRR	**46%**	**7%**	**0%**	**N/A**	**16.0%**

12. **Aggressive Use of Option Values:** To reduce overall T12F fund riskiness and also to reduce the required investment multiple of T12F investments, the fund will need to employ option value thinking. This is eminently do-able. Since T12F will be investing in several rounds of successful portfolio companies, and will pruning unsuccessful companies, a large fraction of the overall fund dollar investment could be made in later years of the fund when the incremental risk is reduced substantially, thereby generating a higher IRR.

    For example, let's assume that T12F invests $33.3 in year 1 in each of 10 portfolio companies (Table 3; the 1/3 investment level compared to the 'normal VC' proforma in Table 1 reflects a need to reserve more of the fund's capital to support follow-on rounds). Two years later, the fund writes off its investments in companies 1, 2 and 3, and invests $33.3 each in companies 4-7. Two years after that, it writes off its investment in companies 4, 5 and 6, and invests $66.7 each in companies 7,8, 9 and 10. Two years after that, it writes off its position in companies 7 and 8 and 9, and invests $100 in 'keeper company' 10 – leaving company 10 as the only remaining company in the portfolio. In Year 10, the fund sells its position in company 10 for a 12.4x multiple on funds invested in company 10.

    The net result is that on a T12F fund investing a total of $1000 (the same as in our Table 1/2 proformas), the fund generates a 16.0% IRR, with the one successful company having a 14x multiple, compared to the 44x multiple required in Table 2 without option values. The basic point is that the aggressive use of option values reduces the required investment multiple.

    Hopefully, by aggressive pruning and follow-up investments in high payoff deals, T12F will be able to generate higher returns than this.

13. **Back-ended GP carry:** If we want our T12F fund to generate high returns, we need to give the general partner the incentive to aim high. In place of the standard 20% carried interest on profits, T12F should consider lower carries below 16% IRR and higher carries above 16%.

Conclusion

To deal with endemic structural problems associated with normal VC funds (highlighted in "VCs and Innovation"), we believe that the right answer is to develop a new VC business model for an innovation-oriented fund that is focused solely on T1 and T2 investments. Such a T12F will have a structure that is different from ordinary funds along the dimensions described above. Managed appropriately, the fund can have returns at least as good as traditional funds, and possibly much higher returns, by focusing on deals that have strong prospects of transforming significant markets.

Table 3
Pro Forma T12F Fund
Using Option Value Pruning

	Company 1	2	3	4	5	6	7	8	9	10	Total
Year 1	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	**-400**
Year 2	-	-	-		-	-	-	-	-	-	**-**
Year 3	-	-	-	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	**-233.1**
Year 4	-	-	-		-	-					**-**
Year 5	-	-	-		-	-	-66.7	-66.7	-66.7	-66.7	**-266.7**
Year 6	-	-	-		-	-					**-**
Year 7	-	-	-		-	-	-	-	-	-100.0	**-100**
Year 8	-	-	-		-	-	-	-	-	-	**-**
Year 9	-	-	-		-	-	-	-	-	-	**-**
Year 10	-	-	-		-	-	-	-	-	2900.0	**2,900.00**
Investment	-33.3	-33.3	-33.3	-66.7	-66.7	-66.7	-133.3	-133.3	-133.3	2666.7	**-999.8**
IRR	**Loss**	**Loss**	**Loss**	**Loss**	**Loss**	**Loss**	**Loss**	**Loss**	**Loss**	**70.10%**	**16.00%**
Investment Multiple	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12.43**	**2.9**