

# Venture Capital & Seed Activity in NYS:

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## Perception, Reality, and Unrealized Potential

*Part I of a Two-Part Series*

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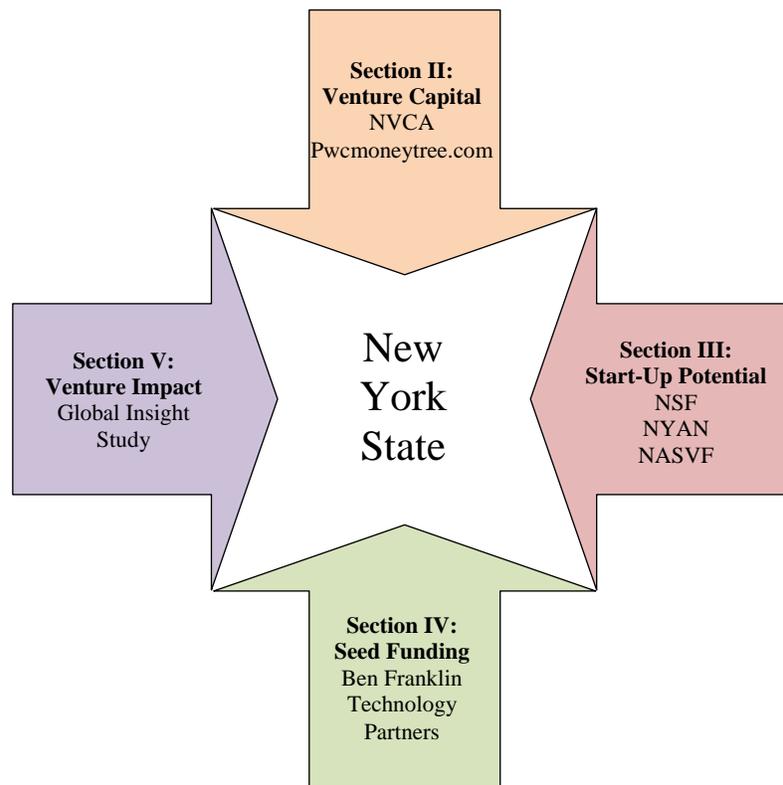
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## I. Introduction

This report tells a story about venture capital activity in New York State, particularly at the seed stage, and the unrealized potential in leveraging the incredible amount of research and development that is being generated at pre-eminent universities across the region. There are many misperceptions and misunderstandings about these matters among our state, regional, and local community stakeholders. Rather than discuss these issues anecdotally, we have elected to provide a significant amount of data in this white paper to paint the picture of what is really happening here in NYS.

As shown below, we have assembled data from “the four corners of the earth”.



***In Section II, we discuss Venture Capital investing here in NYS.*** The data in this section comes from the National Venture Capital Association (NVCA) and Pwcmoneytree.com. With over 60 venture capital (VC) firms, mostly concentrated in New York City, one of the biggest misperceptions is that we are one of the leading states in the nation in terms of venture capital activity and “up there” with California. A look at the data tempers that perception. It also leaves us with the question of whether or not we have enough companies in our state that are “investment worthy”.

***In Section III, we assess the potential in NYS for creating “investment worthy” Start-Ups.*** We go back to basics and take a look at our universities. We assemble data from the National Science Foundation (NSF) that provides insight into the incredible level of R&D at our universities. There is a general under-appreciation of the enormous potential for university spin-outs both Upstate and Downstate. But such spin-outs require seed capital to launch. The New York Angel Network

(NYAN) has provided data for this report relative to the commitment on the part of Angel Groups across NY to fund start-ups. We have also assembled data from the National Association of Seed and Venture Funds (NASVF) that illuminates the level of commitment on the part of NYS to supporting start-ups relative to what other states are doing. The data will likely be surprising to many.

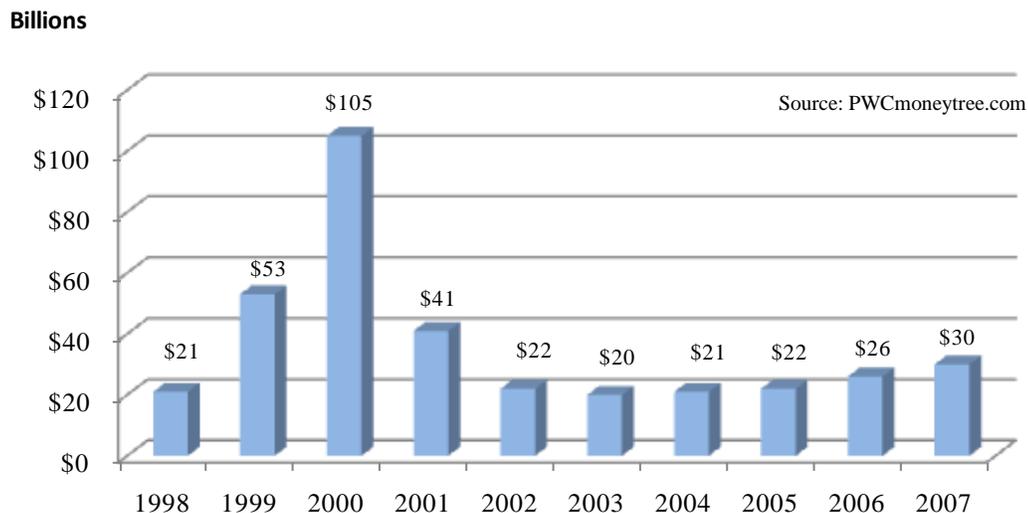
***In Section IV, we benchmark against Pennsylvania.*** Seed capital is severely lacking across NYS as elsewhere but many states have implemented solutions. While there is some acknowledgement as to the problem in our state, there seem to be many misconceptions regarding the nature of the solution and its scope. We take a particularly close look at the Ben Franklin Technology Partner (BFTP) Funds in Pennsylvania and provide data that reveal what a “replica” fund would look like in NYS.

***In Section V, we provide some final metrics on venture impact, relative to job creation and revenue generation.*** The NVCA commissioned Global Insight to conduct a study on the economic importance of venture-capital backed companies to the US economy in 2007. Data is also provided here at the state level. This section leaves us with the question about how committed we are as a state to realizing the potential of venture investing.

NYS has historically relied on the financial industry Downstate and major corporations Upstate for its economic strength. But we need to diversify our assets to participate in a global economy. Our objective in this white paper is to offer a candid look at the New York State data as it pertains to venture capital activity and the unrealized potential in growing a knowledge-based economy. We also offer potential solutions. There is no need to reinvent the wheel. Other states offer models.

## II. Venture Capital in NYS

**National VC Investments.** Before focusing on venture capital activity in New York State, we will first look at venture investing activity throughout the nation for the past ten years. The annual venture investing trend is shown in the following graph. In 1998, the total for annual VC investments was about \$21B. By 1999, that number had more than doubled to about \$53B. By 2000, it was \$105B. This was of course due to the dot.com and telecommunications bubble. But the bubble burst and VCs lost billions. They became more cautious and the following year investing plummeted to about \$41B. By 2003, it had dropped further to \$20B. In 2004, it was at \$21B. The market has been fairly stable since then. Investing has slowly increased each year approaching nearly \$30B in 2007. In 2008, investing was again nearly \$30B. With the current volatility of the market, it is anyone's guess what will happen in 2009 but general expectations are that activity will slow somewhat for the foreseeable future.



*Graph 1: Annual National VC Investments*

**Distribution of Capital.** After understanding how much venture capital is being invested nationwide, the next logical question becomes: so where is the money going? The answer is relatively simple. Year in and year out, the relative percentages received by states change little. Most of the money goes to California. And then a good portion comes to Massachusetts (basically Boston). Then the percentages drop precipitously and the rest of the nation shares in what remains.

To get specific numbers, we will use 2007 as a representative year. Table 1 focuses on the six states that, for every category discussed in this report, are consistently at the top of each list, i.e., besides New York, there is California, Massachusetts, Texas, Pennsylvania, and Maryland.

Nearly \$30B was invested in 2007. California is the most populous state in the union, but with 12% of the nation's population, it received nearly half of the nation's venture capital. Because of the activity

in Boston, Massachusetts ranked at #2, followed by Texas. Washington was #4 with \$1.3B but is not listed in the table because it is not one of our “comparison states”. At #5, New York received only 4% of the nation’s total.

Source: NVCA Yearbook 2008

Rank	State	Investments (\$M)	Pct of Total	No. of Companies
1	California	\$14,150	47%	1,313
2	Massachusetts	\$3,540	12%	356
3	Texas	\$1,427	5%	140
5	New York	\$1,168	4%	162
6	Pennsylvania	\$850	3%	140
7	Maryland	\$638	2%	87
--	Rest of Country	\$8,108	27%	1,028
--	Total	\$29,880	100%	3,226

Table 1: VC Investments by State, 2007

So California received nearly 50% of the venture capital and invested in about 1,300 companies while NYS received 4% and invested in 162 companies. \$30B was invested nationally in 2007 and NYS received just over \$1B. Relatively speaking, the investing activity in NY was not that great. This seems a bit surprising and counterintuitive! We are the third largest state in the union. NYC is the financial capital of the world. And we all know that there are “tons” of VCs down in NYC. In fact, the VCs in NYC are all discussed in the same breath as the VCs in Silicon Valley and Boston.

Maybe we need to separate out the question about how much venture capital each state receives from the questions about how much venture capital each state has under management and how much capital each state deploys across the nation.

**Capital Under Management and Capital Deployed.** Table 2 below reveals some interesting metrics. Again, 2007 is the representative year. While California (CA) had about 39% of the nation’s venture capital under management, it only deployed about 30% while it received about 47%. Massachusetts (MA) had about 18% of the nation’s venture capital under management, it deployed about 12% while it received about 12%. New York, as we know intuitively and from the data, comes in at #3 in terms

Source: NVCA Yearbook 2008

Rank	State	Capital Under Management	Total Capital Deployed	Total Capital Received
1	CA	\$99,372 39%	\$8,989 30%	\$14,150 47%
2	MA	\$46,756 18%	\$3,499 12%	\$3,540 12%
3	NY	\$31,508 12%	\$2,828 9%	\$1,168 4%
5	MD	\$10,518 4%	\$769 3%	\$638 2%
6	TX	\$7,092 3%	\$682 2%	\$1,427 5%
7	PA	\$5,265 2%	\$479 2%	\$850 3%
--	Rest of Country	\$56,590 22%	\$12,635 42%	\$11,721 39%
--	Total	\$257,100 100%	\$29,880 100%	\$29,880 100%

Table 2: VC Under Management and Capital Deployed (\$M), 2007

of capital under management. NYS managed about 12% of the nation’s venture capital, deployed about 9% but only received about 4%! New York State deployed more than twice as much as it received. Connecticut came in #4 with \$15B under management but is not listed here because it is not one of our “comparison states”. Interestingly, both Texas (TX) and Pennsylvania (PA) received more than they deployed.

**Taking Care of One’s Own. In-State Investing.** The next question provoked by the statistics above then becomes, if NYS VCs are sending more money out of state than is being received, then just how much money did they (and others) invest “at home”. Table 3 shows in-state investing for states of interest.

Source: NVCA Yearbook 2008

State	Total Capital Deployed (\$M)	Capital that Remained In-State (\$M)	
CA	\$8,989	\$6,498	72%
TX	\$682	\$317	47%
MA	\$3,499	\$1,307	37%
PA	\$479	\$148	31%
MD	\$769	\$80	10%
NY	\$2,828	\$250	9%

Table 3: In-State Investing, 2007

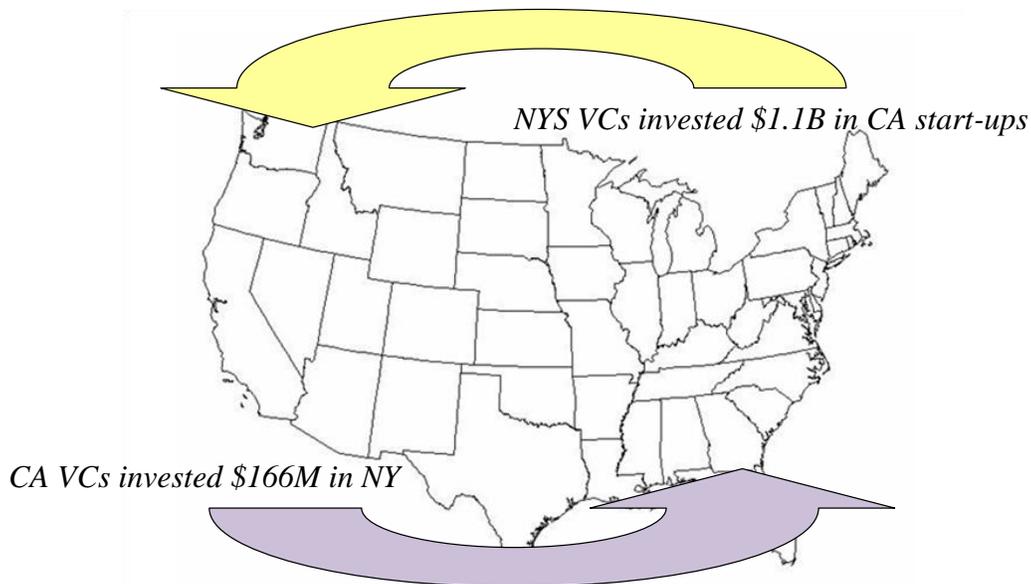
Of the nearly \$9B that California VCs invested in 2007, 72% was invested in-state. Texas VCs invested 47% in-state. Both Massachusetts and Pennsylvania VCs kept significant amounts of capital in-state. New York only invested \$250M in start-up companies within the state. That means that 91% of the in-state capital was deployed outside the state. This begs the question: where did the NY VCs invest their money? By showing the sources versus the targets of venture investing, Table 4 has the answer.

Source: NVCA Yearbook 2008

		T a r g e t					
STATE	Total Deployed	CA	MA	TX	NY	PA	MD
CA	8,989	6,498	595	192	166	122	136
MA	3,499	899	1,307	74	221	48	60
NY	2,828	1,119	301	146	250	178	65
MD	769	346	24	41	7	11	80
TX	682	179	40	317	5	3	11
PA	479	121	18	31	17	148	7
Total Received	29,880	14,150	3,540	1,427	1,168	850	638

Table 4: Sources versus Targets of Venture Capital Investing (\$M), 2007

In Table 4, the primary sources of venture capital are listed vertically in the left hand column. The recipients or targets of venture capital are shown horizontally. NYS is deploying all but \$250M of \$2.8B to other states. We are sending our money to California in large amounts but California is not sending its money to us.



The more provocative question might be: why are NY VCs not investing much “at home” and why are CA VCs likewise investing very little in NY start-ups? It’s too soon to speculate on the answer to that question. We’ll attempt to answer it later in this paper.

So, at this point, again with 2007 as a representative year, we understand that only about 4% of the nation’s total venture capital typically comes to NYS. The next question becomes: how much of that went Upstate versus Downstate?

**Upstate / Downstate Split.** Table 5 data is taken from [www.pwcmoneytree.com](http://www.pwcmoneytree.com). Up until now, we

Region	Investment (\$M)	%/Tot	Deals
Silicon Valley	\$10,067	34.2%	1184
New England	\$3,695	12.6%	478
San Diego	\$1,989	6.8%	159
Southeast	\$1,856	6.3%	243
NY Metro	\$1,715	5.8%	254
LA/Orange County	\$1,648	5.6%	205
Northwest	\$1,636	5.6%	216
Texas	\$1,416	4.8%	166
Midwest	\$1,298	4.4%	236
DC/Metroplex	\$1,242	4.2%	207
Philadelphia Metro	\$861	2.9%	125
Colorado	\$564	1.9%	86
Southwest	\$541	1.8%	90
North Central	\$526	1.8%	80
Upstate NY	\$137	0.5%	32
Sacramento/N. Cal	\$100	0.3%	16
South Central	\$92	0.3%	27
AK/HI/PR	\$20	0.1%	9
<b>TOTAL</b>	<b>\$29,403</b>	<b>100%</b>	<b>3813</b>

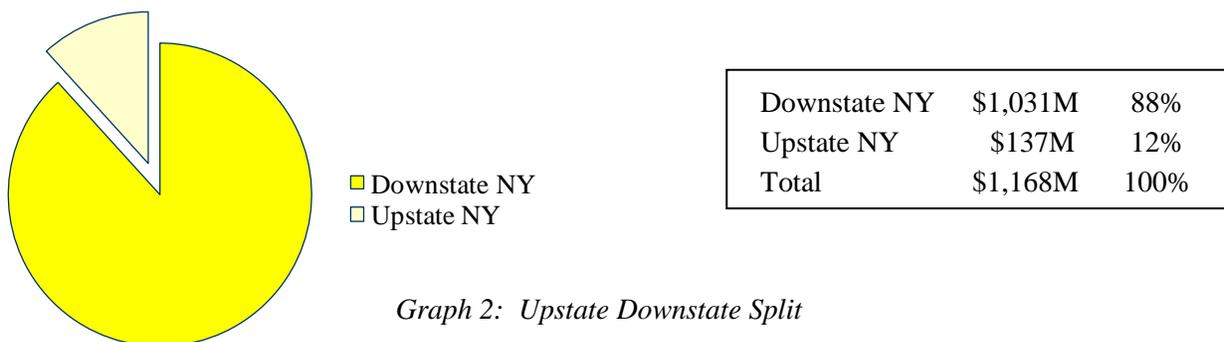
Table 5: Annual VC Investments by Region, 2007

have been using primarily NVCA (National Venture Capital Association) data which reports out by state. Now, we'll look at Pwcmoneytree data which reports out by region so that we can see the split between Upstate and Downstate NY, highlighted in Table 5 in yellow.

However, note that the total for Metro and Upstate NY in Table 5 is \$1,852M versus the \$1,168M reported for NYS by NVCA in Table 1. The discrepancy is easily explained. Pwcmoneytree defines "Metro NY" as "Metropolitan NY area, northern New Jersey, and Fairfield County, Connecticut". Therefore, Pwcmoneytree appears to be giving credit to NYC for money that is technically being invested in neighboring states. To determine how much money is actually being invested in Downstate NY, we can calculate simply as follows. In 2007:

- \$137M was invested Upstate (PWCmoneytree).
- The total for NYS was \$1,168M (NVCA).
- Therefore, Downstate NY must have received about \$1,031M.

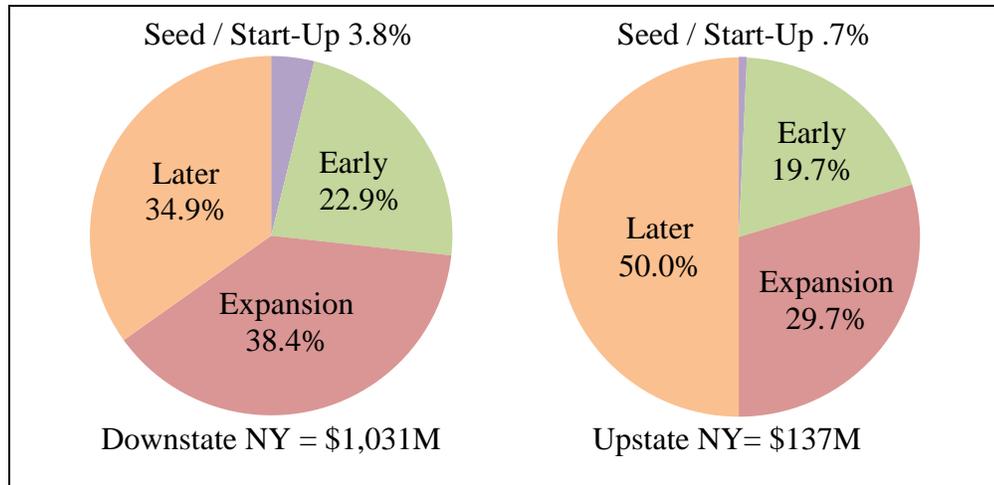
To illustrate the relative split between Upstate versus Downstate investing, we created the following pie:



Most of the NY VCs firms are located Downstate (53 out of 64 is our best reckoning), so logically Downstate start-ups probably have an advantage over Upstate companies in received capital from the NYC VCs as well as their out-of-state syndication partners. This represents an unfortunate situation for Upstate entrepreneurs. Upstate NY is a venture capital desert. Yet, in the next section of this paper, we will discuss the nearly 50:50 split of technical innovation being federally financed in this state between Upstate and Downstate. There seems to be much potential lost opportunity Upstate.

***Investing by Development Stage in NYS.*** Now that we understand *how much* money is being invested in NYS and elsewhere in the nation, the next question becomes *when* is the money being invested. Of the money that came to NYS in 2007, what types of companies, as defined by their stage of development, received monies?

Readers should understand that VCs invest in seed, early, expansion, and later stage companies in that order. Seed stage investing tends to be very high risk because these are pre-revenue companies. Early stage companies are just starting to realize revenues. Expansion and later stage companies already have commercially available product or services and are demonstrating significant revenue growth. These latter investments tend to be lower risk, require less oversight and guidance by the VCs, and net higher returns. Naturally, we might expect VCs to gravitate towards "arriving later". Indeed, that is the case.

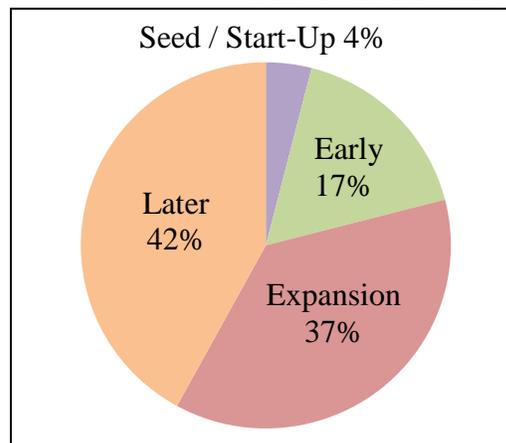


Graph 3: VC Investments in NYS by Stage of Development, 2007

In the pie graph above, Downstate statistics are on the left while Upstate statistics are on the right. Of the monies that are received in this state, relatively small amounts are being committed by VCs to seed stage companies. Both Upstate and Downstate NY have the same problem. There is simply a general and serious lack of seed capital for start-ups.

**VCs Arriving Later.** What we’re seeing in NYS is very consistent with trends across the country. Graph 4 shows national numbers for seed, early, expansion, and later stage investing at 4%, 17%, 37%, and 42%, respectively.

Historically, expansion stage investing has been the sweet spot for VCs, typically representing fifty percent or more of the total capital invested. But since the bubble years, VCs have moved downstream to “safer waters”. Now, in recent years, later stage investing has become equal to, and surpassed expansion stage investing. Early stage investing is not as preferred as expansion and later stage, but VCs still commit considerable capital at this stage. Seed investing by VCs is a rarity.



Graph 4: National VC Investments by Stage, 2007

The very low numbers relative to seed stage investing sends a clear message to the entrepreneurial community. “Find your seed money elsewhere.” This is high-stakes, labor-intensive investing. This is not a space that VCs participate in to any great extent anymore.

Further, in the US there are 741 VC firms managing 1,549 funds totaling \$257B. The average size of a venture fund in CA, MA and NYC is nearly \$200M and the average size for an investment is \$7M. This is big investing. VCs don’t want to dole out \$250-500K at a time. On the other hand, seed stage start-ups are not positioned to accept, and do not need \$7M on average to launch.

**Section Summary.** This section contained six pages of statistics, so let's summarize before we continue.

**NYS is not the “hub” of venture activity that some may think.**

- In 2007, which is very much a representative year for venture capital activity across the nation, VCs invested a total of nearly \$30B.
- Of that amount, NYS received \$1.1B or 4% of the national total. \$1B went Downstate and only \$137M came to Upstate for 162 companies total for the state. In terms of VC activity, NY is not even close to CA and MA and drops below TX and WA. Upstate NY is a venture capital desert.

**For some reason, NY VCs chose not to invest (much) in their own state.**

- NY ranks 3<sup>rd</sup> in the nation for capital under management. NY VC firms, mostly in NYC, controlled 12% of the total venture capital under management nationally and deployed 9% of the national total. However,
  - 91% of their deployed capital went out of state, 40% was invested in CA start-ups.
  - Only 9% was invested in NY start-ups (compared to 72% of CA VC capital which was invested in CA).
- For some reason, NY VCs chose to invest only \$250M in their own state.
- MA VCs don't invest much here either (\$221M) nor do California VCs (\$166M).

**There is a growing problem for seed stage start-ups.**

- Nationwide, VCs are sending a message to seed stage companies “Find your seed money elsewhere and then come to us after you've matured.”
- Consistent with nationwide trends, less than 4% of Downstate venture capital was invested at the seed stage and less than 1% of Upstate capital was seed.

What does all this mean? The statistics about VCs (including our own!) investing “everywhere” but in NYS are particularly disturbing. Could it possibly be that we don't have companies worth investing in in NYS? Or is it that we are so lacking in seed capital that we can't get companies off the ground to feed the pipeline for later stage investments?

### III. Start-Up Potential

Prompted by the questions above, we will attempt to find some answers. We will focus in this section on the start-up potential in NYS and what is required to launch new companies.

Let's get back to basics and consider the source of start-up companies. High-potential start-ups that receive VC-backing tend to be high-tech. High-tech start-ups tend to be built around high-tech inventions which have taken years of research and thousands/millions of dollars to develop. Funding for high-tech R&D is generally provided within corporations or to university-based teams by the federal government, e.g., NIH, DoD, DARPA. This tells us that corporate or university-based technology inventions can be used as a basis for new high-tech start-up companies that can create jobs and generate revenues for the region. But of course, corporations don't generally spin-out their inventions while universities do. This is common practice in our "comparison states", especially CA and MA. Therefore, it behooves us to take a look at the strength of our universities across NYS.

**University R&D Expenditure, 2006.** We have good news. One of the things we do very well in New York State is research and development at our universities. In fact, we're not sure that many New Yorkers, even those within the universities fully appreciate how well we do. We expend about \$4B annually in NYS. We are #2 in the nation, second only to California.

Rank	State	R&D (\$M)	Pct of Total
1	California	\$6,493	14%
2	New York	\$3,789	8%
3	Texas	\$3,270	7%
4	Maryland	\$2,530	5%
5	Pennsylvania	\$2,428	5%
6	Massachusetts	\$2,158	5%
--	Rest of Country	\$27,092	57%
--	Total	\$47,760	100%

Source: NSF  
fiscal year  
2006 Survey of  
R&D  
Expenditures at  
Universities  
and Colleges

Table 6: University R&D Expenditure, 2006

According to recent 2006 statistics, the national total for university R&D expenditures is \$48B. As shown in Table 6, NYS expends about 8% of national total. Unlike with the venture capital situation, we're not that far behind California and we exceed the R&D in MA and PA by significant amounts. Further, keep in mind that these are strictly university R&D numbers. We should also include the activity at our other elite academic (but non-university) facilities such as Brookhaven National Laboratory, Cold Springs Harbor, Roswell Park Cancer Institute, and Hauptman-Woodward.

**Upstate Downstate Split.** So, let's focus again on the Upstate Downstate split. Table 7 lists the ten universities with R&D expenditures near or over \$200M annually. Four of the top six are Upstate. As shown in Table 7, when the R&D numbers for all NYS universities are summed, the nearly \$4B total splits 50:50 between Upstate and Downstate -- just under \$2B each. This is probably surprising to many. However, Brookhaven Labs is another huge state asset with \$490M in annual R&D. Adding in Brookhaven and the other labs mentioned above provides a grand total of \$4.5B for NYS and a split of \$2.0B Upstate and \$2.5B Downstate.

Source: 2006 NSF Survey

Top 10 NY Universities	2006 R&D (\$K)
Cornell U	\$648,802
Columbia U	\$529,945
U Rochester	\$366,658
U Buffalo	\$297,909
NYU	\$284,164
U Albany	\$274,354
Mt Sinai	\$273,216
Stony Brook U	\$234,635
Rockefeller U	\$215,417
Yeshiva U	\$189,416
Total for these Univ	\$3,314,516
% of State Total	87%
9 Univ \$20-100M	\$320,961
45 Univ <\$20M	\$154,181
<b>Total for State (U only)</b>	<b>\$3,789,658</b>
Brookhaven Nat'l Lab	\$490,686
3 Non-Univ Labs (est.)	\$190,000
<b>Total for State (All)</b>	<b>\$4,470,344</b>

Table 7: Top 10 Universities in NYS, 2006

Source: 2006 NSF Survey

Upstate (\$K)	Downstate (\$K)
Cornell U	Columbia U
U Rochester	NYU
U Buffalo	Mt. Sinai
U Albany	Stony Brook U
Syracuse U	Rockefeller U
Upstate Medical	Yeshiva U
SUNY ESF	Cornell Weill
RPI	Downstate Medical
RIT	NY Medical Campus
Binghamton U	Polytechnic
Clarkson U	CUNYs
Other SUNYs	Other SUNYs
All Others	All Others
<b>\$1,852,964</b>	<b>\$1,936,694</b>
<b>\$3,789,658</b>	
Roswell Park	Brookhaven
Hauptman Woodward	Cold Springs Harbor
<b>\$1,977,964</b>	<b>\$2,492,380</b>

Table 8: R&D Expenditures in NYS, 2006

Based on these findings, it would seem that there is extremely high potential to create tech-based spin-out companies, both Upstate and Downstate. But of course, it is not possible to simply take an invention from an academic laboratory and form an investable company overnight. Start-ups progress through industry recognized stages of development.

**The Valley of Death.** Seed stage companies that have just recently incorporated are typically filing their patents, writing their business plans, building their management teams, finalizing their prototypes, optimizing their molecules and proving that their technology actually works outside the laboratory. This takes time and money and must occur before revenues can be generated. Companies need financial support during this pre-revenue development period.

The financial requirement to get companies through the seed stage is about \$500K for physical science companies and \$750K for life science companies. But it is extremely difficult to secure this capital because it is a period of very high-risk investing. The companies have not yet proven that they can sell a product. In many cases, the product is not even completely built and tested. This phase in a company's development is notoriously known as the "Valley of Death" for obvious reasons. Many companies die before they can get through the valley because of lack of capital.

In NYS, we have much potential for university spin-outs but they need seed capital to launch and grow. Who is willing to take a chance on funding seed stage companies? Where can that seed capital come from in our state? From VCs? From Angels? From the State? First, we'll take a look at VCs. Actually we already did.

**VCs as Seed Investors (or not).** In Section II, we already discussed this. VCs generally don't do seed funding anymore. They have moved downstream. They will invest in early stage companies but

their sweet spot is really expansion and later stage. This trend by VCs has created a problem in NYS, both Upstate and Downstate, as well as nationwide.

Over the last five to six years, Angel Groups and States have started to mobilize and are stepping in to help fill the “Seed Capital Gap”. What we want to look at next are the Angel Groups that are forming up across NYS and what the State of NY is doing.

***NYS Angel Networks.*** Something very good across the state is happening and that is that the Angels are getting organized. We now have several organized Angels Networks.

- *Western NY Venture Association, Buffalo*
- *Rochester Angel Network (RAN)*
- *Central New York Seed Capital Fund, Syracuse*
- *Tech Valley Angel Network, Albany*
- *Orange County Angels*
- *New York Angels*
- *Long Island Angels, etc.*

Many of these groups are “brand new”. The RAN group in Rochester organized in 2006. The Syracuse Angels made their first investment in 2008. The New York City Angels have been around for the longest time and are the largest and most established group. The Long Island Angels also just recently organized within the last year.

In addition, a collaboration among organized angel investor groups has resulted in the formation of the New York Angel Network (NYAN). NYAN consists of 11 organized Angel Investor Groups. Membership in these groups currently totals over 300 individual investors. In 2006, they invested in 17 high-tech, high-growth start-up companies. The majority of investments were the range of \$350-400K. The range of investment by individual angel investors in these groups varied from \$25-500K, with the majority of investors in the range of \$25-50K. The creation of NYAN has helped to facilitate communication and collaboration within the angel investment community and to align money, business experience and investment opportunities across the state.

This is all good news. Definitely, these are positive trends. But we’ve also seen some problems. We’ve seen that once organized, some Angels Groups move downstream to early stage investing. They expect portfolio companies to have early revenues -- most seed stage companies are pre-revenue. We’ve also seen that they tend to shy away from life sciences. Much of the Upstate wealth was created in manufacturing. Downstate wealth was created in the financial industry. So life sciences and complex protein therapeutic development pathways are foreign to them and outside their comfort zone. Also, life science companies tend to be very expensive and take many years before they “hit big”. The Angel disinterest in life sciences is unfortunate because:

- ***76% of Downstate R&D is Bio***
- ***56% of Upstate R&D is Bio***

Another difficulty with Angel groups is that not all are positioned to lead the due diligence, deal syndication, and negotiations of deal terms. They are independent groups of investors and the majority do not have a committed full-time staff member or managing director.

Having said all that, we want to reinforce the fact that Angels play a hugely important role. They are using their own money to make investments in high risk companies. They may or may not see a return. Entrepreneurs should be grateful for their participation. Angels make excellent syndication partners for professional investors who are willing to invest at the seed stage and are an excellent source of co-investor capital.

**State Capital for Start-Ups.** Now let's move on and take a look at what the states are providing in terms of capital for start-ups. In 2006, the National Association for Seed and Venture Funds (NASVF) conducted a survey called "*State Commitments to Current Capital Programs*". Their focus was on programs that provided funding primarily for technology commercialization and start-up to later stage capitalization. This included capital programs that provide research, pre-seed, seed, venture, mezzanine and late stage capital, grants and development loans.

The results of the survey showed that California, Pennsylvania, Maryland, and Texas all ranked at or near the top. New York State on the other hand ranked #25 -- below West Virginia, Alabama, South Dakota, Arkansas, Maine, Idaho ...

### NASVF Survey: "State Commitments to Current Capital Programs"

1. California	\$1,488,000,000
2. Pennsylvania	\$662,823,500
3. Ohio	\$578,070,000
4. Maryland	\$346,450,000
5. Alaska	\$335,556,000
6. New Jersey	\$231,000,000
7. Oklahoma	\$224,238,495
8. Texas	\$200,000,000
9. Iowa	\$199,800,000
10. Indiana	\$154,000,000
11. Michigan	\$153,071,600
12. Wisconsin	\$120,200,000
13. Colorado	\$102,000,000
14. West Virginia	\$101,500,000
15. Alabama	\$100,000,000
16. Utah	\$100,000,000
17. South Dakota	\$78,000,000
18. North Carolina	\$76,500,000
19. Arkansas	\$74,308,000
20. Illinois	\$64,500,000
21. Washington	\$64,500,000
22. Maine	\$61,000,000
23. Oregon	\$55,000,000
24. Idaho	\$40,200,000
25. New York	\$40,000,000

Table 9: State Capital for Start-Ups

This is the only publically available data of its kind and NYS ended up towards the bottom (#25 out of the 44 states that responded to the survey).

**State Support Relative to R&D.** We thought it might be interesting to put some numbers side by side and look at state support relative to R&D. If we calculate ratios ... by juxtaposing the dollars invested in R&D versus capital committed by states to supporting new and emerging ventures, we find the following:

State	University R&D Expenditures (\$K)	State-Supported VC Programs (\$K)	Ratio R&D:State VC
Pennsylvania	\$2,428,346	\$662,823	3.7 : 1
California	\$6,493,388	\$1,488,000	4.4 : 1
Maryland	\$2,530,231	\$346,450	7 : 1
Texas	\$3,270,728	\$200,000	16: 1
New York	\$3,789,658	\$40,000	95 : 1

Table 10: State Support Relative to R&D

This tells us, for example, that for every \$3.70 that PA universities expend annually for R&D, the State of PA has committed \$1.00 in some program to support commercialization and new and emerging start-ups. For every \$4.40 that CA universities expend annually for R&D, the State of CA has committed \$1.00 to support commercialization and new and emerging start-ups. \$7 : \$1 for MD, \$16 : \$1 for TX. Meanwhile, for every \$95.00 that NY universities expends annually for R&D, the State of NY has committed \$1.00 to support commercialization.

Given the survey methodology and the variability among the programs assessed in both type and time, it's hard to say if the numbers and ratios are perfectly accurate and this data must be presented with this caveat. But the data's message is consistent with our experience and the industry literature. As we look around NYS, we don't see many state-venture programs, particularly at the seed stage. Clearly we're getting the impression that states like PA, CA, MD, and TX are doing a better job of supporting their researchers, leveraging R&D, and creating start-ups.

**Section Summary.** So as we wrap up this section on start-up potential, we'd like to summarize by saying:

- \$4.5 B in mostly federally funded R&D at our academic research institutions
- #2 in the nation just for our universities alone
- R&D dollars are split almost evenly between Upstate and Downstate

Our universities and academic centers should be applauded!

But for seed capital to launch and support university spin-outs,

- We cannot count on professional VCs at the seed stage
- Angels are great seed investors, but are not a perfect solution and cannot bear all the responsibility
- Relative to the state of NY, it looks like relatively little has been done to establish state-supported venture funds, especially at the seed stage, and what has been done is disproportionate to the potential.

#### IV. Seed Funding for Company Launch

At this point, we've learned that the potential to create investment worthy start-ups is high but relative to other states, disproportionately little is being done in NYS to help launch start-ups via state-supported venture funds, especially at the point of greatest need, which is at the seed stage.

Therefore, in this section, we consider the possibility of establishing a state-supported seed fund in NYS. We're going to use PA's Ben Franklin Technology Partner (BFTP) Funds as a model. BFTPs are PA's state-supported seed funds which have been in operation for the past 25 years. BFTP is one of the most widely known and emulated state economic development programs, both nationally and internationally.

It appears that PA has been segmented according to population and critical mass of R&D. There are four BFTP centers in the state near Philadelphia (southeast), College Station (central), Pittsburg (southwest) and one rural center (northeast). Academic R&D in and around the first three centers is about \$700M each at UPenn, Penn State, and Carnegie-Mellon/U Pitt, respectively. Each center receives about \$5M annually from the state (for a total of \$20M). This money is earmarked for seed stage equity investing and also covers the operating costs of the centers, including staff.

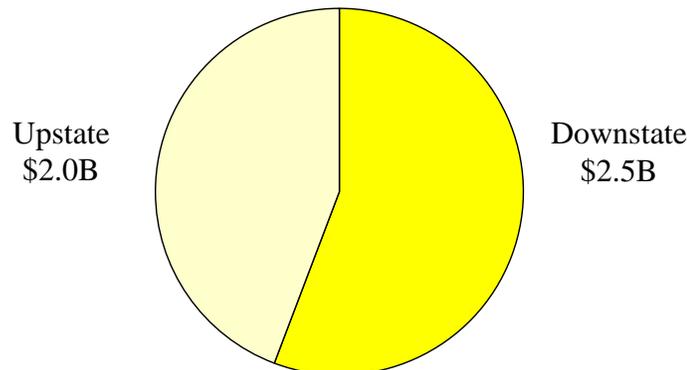
(In addition to BFTP, in 2002, PA used tobacco settlement money to form three seed stage Greenhouse Funds of about \$20M each exclusively for Life Science start-ups. But for now, our focus is just on replicating BFTP.)

So to establish BFTP equivalents in NYS, we would have to:

- 1) Segment NY according to population and critical mass of R&D
- 2) Determine how much each center should receive annually
- 3) Justify the number relative to deal flow and deal size

So, let's do 1, 2, and 3. First we'll segment the state.

**Segmenting NYS.** As everyone knows, NYC is a "heavy weight city" in NYS on many levels. It's very hard for Buffalo, Rochester, Ithaca, Syracuse, and Albany to each independently compete with "the city". Even when it comes to critical mass of R&D, each of these Upstate regions independently cannot balance NYC (plus Long Island!). However collectively, the Upstate communities balance Downstate very well. So, if we want to segment NY according to critical mass of R&D, there already seems to be a "natural", balanced segmentation as shown below:



Graph 5: Segmenting NYS According to Critical Mass of Academic R&D

So for sake of discussion, let's propose the establishment of two major BFTP type centers, one Upstate and one Downstate. Each center would create a staff and manage a Seed Fund like BFTP.

**Funding Per Center.** Next, we need to determine how much money each center would receive annually. Let's set up a proportionate relationship. If PA provides \$20M annually relative to \$2.4B of R&D, then the equivalent in NY would be \$37M for \$4.5B of R&D. A proportionate split for Upstate and Downstate would suggest \$20M for a Downstate Center and \$17M for an Upstate Center.

PA:	\$20M for \$2.4B of R&D
Equivalent NY:	\$37M for \$4.5B of R&D
	i.e., \$20M Downstate for \$2.5B of R&D
	\$17M Upstate for \$2.0B of R&D

Keep in mind that these are all annual numbers!

Now let's try to justify these fund size numbers relative to deal flow and deal size.

**Justify Relative to Deal Flow and Deal Size.** If we were to set up these funds, how much deal flow do we have or could we expect in Upstate and Downstate each year? *For right now, we'll focus just on Upstate.* We're going to say that we can conservatively expect at least 5 investable deals per year per region. There are five major regions (Buffalo, Rochester, Ithaca, Syracuse, and Albany), so 5 times 5 equals 25 deals per year.

Now, what's the right size for a deal? It is extremely important that we do "right-sized" investing otherwise companies die on the vine before they're through the "valley of death". A seed fund's primary objective is to get their companies into the hands of the Round A investors. There is a major misperception that \$50-100K is a seed stage deal. It is not. In today's investing climate, a typical seed stage deal for a "non-bio" company is \$500K. An average "bio" seed stage deal is \$750K.

Now, let's do some simple math to get the right order of magnitude for the size of the Upstate fund. If we make 25 deals per year at \$500K per deal, then we would need \$12.5M per year. If we made 25 deals per year at \$750K per deal, then we need \$19M per year. Let's summarize:

1) Deal Flow:
✓ Expect at least 5 investable deals per year
✓ Per 5 regions: Buffalo, Rochester, Ithaca, Syracuse, Albany,
✓ so 25 deals per year
2) Deal Size:
✓ "Right-sized" investing!
✓ Average "non-bio" seed stage deal is <b>\$500K</b>
✓ Average "bio" seed stage deal is <b>\$750K</b>
<b><i>Some simple math ....</i></b>
<b><i>25 deals per yr X \$500K per deal = \$12.5M per year for Upstate</i></b>
<b><i>25 deals per yr X \$750K per deal = \$19M per year for Upstate</i></b>

If we're right sizing deals, and meeting the need, the numbers add up quickly. It appears that somewhere between \$12.5 - \$19M would be the right size for a fund in Upstate. *Surely, 25+ deals per year is also easily justifiable in NYC and Long Island.* (BFTP invested in 29 start-ups in Philadelphia alone in 2007.) Regardless of the exact number, this is the right order of magnitude per center.

**Math to Optimize Fund Size.** Certainly we can manipulate the math to optimize fund size. If we:  
Add in staffing and operating costs, then the numbers go ↑  
Require 1:1 matching capital, then the numbers go ↓  
Syndicate all deals, then the numbers go ↓  
Increase / decrease the number of deals, then the numbers go ↑ ↓

**The bottom line is that numbers like \$17M or \$20M annually for Upstate, Downstate or \$37M total for NYS are not unreasonable.**

We need to pause and think about this! \$37M available annually (repeat annually) in this state for seed stage investing. We have been so “seed starved” in NYS for so long that it is difficult to even conceive of such numbers. Probably every New Yorker who understands venture capital investing would react to that number and say that’s impossible. This is simply foreign to our thinking in NYS!

- Yet PA has been doing a proportionate level of investing for 25 years.
- MD’s fund is listed annually as one of the most successful venture funds in the nation.
- TX set up a \$200M “Emerging Technology Fund” in 2005. (If this is a five-year fund, that’s \$40M a year.)
- And many more examples of state initiatives can be cited here.

**Keep in mind that these state-supported investments are not grants but rather equity investments. When these not-for-profit funds are managed *as if* they had a for-profit mission, then in time they recover their own operating costs and generate significant returns for the state.**

In 2008, BFTP commissioned an independent study which showed that from 2002-2006, with an investment of \$140M in the funds:

- *The state garnered more than \$517M in additional tax revenue as a direct result*
- *BFTP boosted Pennsylvania’s economy by \$9.3 billion*
- *BFTP generated 10,165 job-years*

**Section Summary.** We actually have some concerns that because NYS has been so lacking in seed capital, that many at the grass roots level are now talking about starting small “seed funds” of \$1-2M each. While these are well intentioned efforts, the level of funding being discussed is typically \$50-100K per deal. That’s pre-seed capital and these are pre-seed funds. It is enough to launch a company into the Valley of Death and then what?

As we wrap up this discussion of the “ideal” seed fund for NYS, we’ll end with this quote from the NASVF: *Seed and Venture Capital State Experiences and Options Survey, May 2006:*

*“The best programs are large enough to make a difference. Creating a **large, visible source of seed and venture capital** will help generate a willingness on the part of would-be entrepreneurs to take the plunge. There is no magic size for a program, but it must be **‘right-sized’** for the entrepreneurial and finance environment within the state.”*

## V. Venture Impact

In this section, we provide some final metrics on the impact that venture capital is having, relative to job creation and revenue generation both nationally, in NYS and in our “comparison states”.

**Job Creation and Revenue Nationally.** According to a Venture Impact study conducted by Global Insight in 2007, employment and sales data conclusively show the importance of venture capital backed companies to the U.S. economy. Together, the nation’s VC-backed companies employed over 10.4 million American workers in high-quality jobs or 9.1 percent of U.S. private sector employment in 2006. VC-backed companies generated \$2.3 trillion in revenue in 2006 or 17.6 percent of the nation’s gross domestic product (GDP).

Further, VC-backed companies outperformed their non-ventured counterparts in job creation and revenue growth. Between 2003 and 2006, employment in VC-backed companies jumped by 3.6 percent, while national employment grew by just 1.4 percent. At the same time, VC-backed company sales grew by more than 11.8 percent, compared to an overall rise in U.S. company sales of 6.5 percent during the same period.

**Job Creation and Revenue by State.** VC-backed companies create jobs in every state and significantly contribute to the economic health of state economies. As shown in Table 11, California, Texas, Pennsylvania, and Massachusetts led the nation for VC-backed employment in 2006 as measured by VC-backed companies headquartered in their states. California provided the greatest number of jobs, totaling nearly 2.4 million in 2006.

Source: Venture Impact, Fourth Edition, Global Insight

Rank	State	Employment at VC-Backed Companies, 2006	Revenue at VC-Backed Companies, 2006 (\$B)
1	California	2,362,400	566.6
2	Texas	1,118,600	293.7
3	Pennsylvania	697,400	121.6 *
4	Massachusetts	674,300	131.3
8	New York	427,700	98.0

\* 5<sup>th</sup> for revenue

Table 11: Jobs and Revenue at VC-Backed Companies

California, Texas, Massachusetts, and Pennsylvania were also the top states by revenue at VC-backed companies headquartered in their state. California was the nation’s leader by this metric, with more than \$566B in revenue tied to VC-backed companies.

New York State was in the #8 position for both job creation and revenue generation by VC-backed companies. States above New York in either category included Georgia, Washington, Tennessee, and Virginia.

**Section Summary.** In short, NYS is starting to seriously trail behind the rest of the pack.

## VI. Conclusions

Given all the data assembled in this white paper, let's now try to summarize with some type of "score sheet".

If we were to use state rankings as "points earned" and focus, as in the table below, just on Academic R&D and VC Under Management, then NY would fair very well among our comparison state with the second highest tally.

Attribute	National Rankings					
	CA	NY	MA	TX	MD	PA
Academic R&D	#1	#2	#6	#3	#4	#5
VC Under Management	#1	#3	#2	#6	#5	#7
"Score"	2	5	8	9	9	12

*Table 12: Summary Table of Previous Metrics*

Our excellent centers of academic research truly are a strength in this state. We have two Ivy League universities, eight other pre-eminent research universities, one national laboratory, and many smaller academic research centers. With about \$4B expended annually for R&D just at our universities, split 50:50 between Upstate and Downstate, we are second only to California. When we add in our other non-university academic centers, the total is pushed up to \$4.5B.

Another apparent strength is that NYS has a significant amount of venture capital under management. We have about 64 VC firms, concentrated primarily in NYC. These firms are managing large funds. However, as such, they tend to focus primarily on expansion and later stage companies. *And since they are expending 91% of their capital on deal flow outside of NYS, that means that, for the most part, start-up companies in our state are not the beneficiaries of these monies.*

Again, using state rankings as "points earned" and now focusing, as below, on some of the other categories reviewed in this paper, NYS drops well behind all the other comparison states (although granted, we are missing one data point each for MA and MD).

Attribute	National Rankings					
	CA	MA	TX	PA	MD	NY
VC Received	#1	#2	#3	#6	#7	#5
Employment in VC-backed Companies	#1	#4	#2	#3	--	#8
Revenues by VC-backed Companies	#1	#4	#2	#5	#15	#8
State Supported Venture Funds	#1	--	#8	#2	#4	#25
"Score"	4	10+	15	16	26+	46

*Table 13: More Summary Metrics*

NYS is not particularly high on the receiving end of venture capital. While we rank #5 nationally, there is an enormous chasm between us and the top recipients, i.e., CA and MA. Relative to the economic impact of VC-backed companies on our economy, at #8, NY drops significantly below the comparison states shown here as well as the other states not shown here. For revenues generated by VC-backed companies, Georgia and Tennessee capture the #6 and #7 ranking positions. For employment in VC-backed companies, Georgia and Virginia rank higher than NYS. But the worst metric of all, is NYS's very low position at #25 for state supported venture capital programs.

Earlier in this paper, we asked the questions: why are NY VCs not investing much "at home" and why are CA and MA VCs likewise investing very little in NYS? Is there not enough qualified deal flow here?

The fact that there is limited state support for "birthing" start-up companies could explain why we are not receiving much venture capital later in the investing continuum, i.e., at the early, expansion, and later stages from either our own VCs as well as outside VCs. We need to do a better job of feeding the pipeline.

It could also explain why we don't rank high for jobs created and revenues generated by VC-backed firms. The fact that Pennsylvania, our neighbor to the south, has historically had a very strong commitment to state-supported venture programs could explain why it consistently ranks higher than NYS in the "Venture Impact" studies and reaps the economic benefits of jobs created and revenues generated.

In these difficult economic times, we hope that this report helps our state, regional, and local community stakeholders recognize the potential of venture investing and the reality of our investing performance relative to other states. The venture capital sector has grown to become a major force and integral part of the U.S. economy. It funds and builds companies from the earliest stage into freestanding, mature organizations. It helps turn ideas and basic science into products and services. It continually reinforces America's entrepreneurial spirit and helps emerging business men and women reach their full potential.

Fundamentally, venture investing is dependent upon a good flow of science and as the data in this report clearly indicates, that is exactly what we have in abundance here in NYS. While finance and manufacturing companies have traditionally comprised much of our current economy, universities and academic research centers may be emerging as powerful economic engines capable of jumpstarting NYS's economy into the 21<sup>st</sup> century. If their full commercial potential is realized, the cutting-edge research and technologies emerging out of these institutions may serve as the basis of a new generation of high-tech companies that hold the key for the future economic growth of New York State.

**Excell Partners Inc.** manages a venture capital fund which provides pre-seed and seed stage financing to high-tech start-up companies. It was formed in partnership with the University of Rochester and the State of New York to support regional economic development. Excell's mission is to bridge the pre-seed and seed stage funding gap which exists in the Upstate New York region and prepare companies for their next major round of financing. Excell focuses on technology companies emerging from regional universities and research centers.

Since 2005, Excell has invested:  
\$2.4 Million Dollars  
In 21 Companies  
In Ithaca, Geneva, Rochester, and Buffalo  
In the fields of Biotechnology, Medical Devices, Industrial/Energy,  
Electronics & Instrumentation, and Consumer Products  
Excell's average investments are matched more than 3:1 by Co-Investors  
for an average total Seed Round raise of about \$500K per company

Total for Co-Investor and Follow-on Funding for our Portfolio Companies has been \$28M  
and 117 jobs have been created with much potential for future growth.

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