

Venture Capital: Looking Outside the Education Sector

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Revenues of for-profit education companies account for only 10% of the \$780 billion spent on education. And the total market capitalization of education stocks makes up less than 1% of U.S. capital markets. But as the millennium dawns, the private sector is poised to play a much larger role...This revolution is being fueled by an explosion in the money available to education startups.¹

Business Week, January 10, 2000

Business Week's prognostication proved not to be prescient – especially in K-12 education. With the exception of a few niche post-secondary education companies, the market capitalization of all education companies is still not much more than what it was in 2000.

Meanwhile, venture capital and private equity have expanded rapidly into other sectors, with the success of well-known, venture-backed companies like Google and MySpace.

Business Week's optimism was based on trends in the knowledge economy, dissatisfaction with the performance of public schools, and education's potential to be the internet's next "killer app". But seven years later, one prominent venture capital investor – who has made several very successful investments in K-12 companies – laments that she would prefer never to invest in K-12 again:

Successful venture investors look for opportunities to leverage intellectual capital in situations where an industry is going through a transformative event – that is, an event that wrecks the economics of big industry players. For example in computers and communications, there were many opportunities for creative destruction. In K-12, the things that make the system more effective are not in interests of the system. There are too many obstacles against transformation. K-12 is not a free market. It is regulated, unionized, bureaucratic, and highly fragmented despite its \$400 billion size.²

The purpose of this chapter is to explain the role that private equity and venture capital firms play in catalyzing changes within industry structures. For example, while the government provided the research dollars to fund the basic research that became the internet, private investors took the next step to invest in companies like Google (to help people search the internet) and Amgen (a biotech firm that creates drugs to cure diseases). Without private capital

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markets, the basic research dollars that government spends would much less efficiently create broad economic benefits. America's innovation economy relies heavily on private capital investors to do this job; the government generally does not invest directly in companies, and very few philanthropists have the mission or capability of playing that role. Contrary to *Business Week's* dawn of the millennium optimism, institutional investors by and large have not "discovered" most segments of the education industry, leaving a vacuum into which private investment dollars flow to fund the companies and sectors that can alter the education industry landscape for widespread benefit.

While it is not the government's role to invest in companies, policy changes have played a significant role in developing the legal and regulatory structures that created venture capital financing – which led to America's leadership position in areas like technology and pharmaceuticals.

This chapter focuses on how the venture capital investment process works outside the education sector, as a way to understand how it could work better within the sector. The first section provides an introduction to how the government helped create the venture capital industry. This section presents an overview of how venture capital industry participants operate, and provides a summary of some common misperceptions about venture investing. The first section also describes the equally large, but less well documented, "angel" market for private capital.

The second section compares investment in post-secondary education to investment in K-12 education. It summarizes some of the key differences between these two segments of the education sector, in order to explain the substantial difference in investment history and opportunity. It also identifies those characteristics that, if employed in K-12, could possibly

attract investment capital. While there are substantial differences between K-12 and post-secondary, advocates of supply-side reform can potentially leverage the experience of post-secondary education investment to germinate a crop of innovative companies in K-12.

The third section explores whether there are concrete models from outside education that could be employed by government or philanthropies to attract and leverage private investment in K-12. Specifically, we present three examples, in increasing order of formality: a prize (or pay for performance) model that is increasingly being used in philanthropy, an angel portal model like the Department of Defense's Defense Venture Catalyst Initiative ("DeVenCI"); and a traditional venture capital co-investment model like the Central Intelligence Agency's In-Q-Tel.

Private Equity, Venture Capital, and Angel Investing

Philanthropists and governments rarely invest capital in for-profit businesses. Even venture philanthropists, often funded by the fruits of for-profit enterprises, rarely invest in for-profit entities. Instead, profit-motivated entrepreneurs rely on the "capital markets" to raise debt and equity investment dollars. Capital markets investments are typically in the form of securities, like bonds or shares of stock. Equity capital represents ownership in companies by governments, public shareholders, private shareholders, company founders, or some or all of the above. "Public" companies like Coca-Cola have many, many shareholders, and anyone can buy or sell publicly traded shares on a regulated exchange like the New York Stock Exchange or NASDAQ. "Private" companies are owned by founders and private investors who cannot trade their shares on a public exchange, but may sell them in private transactions. This chapter is mainly concerned with the private equity market – and within that market, the market for risk capital that can be invested in startups and young, rapidly-growing companies that are not yet big enough or stable enough to have their shares sold to the public in an initial public offering

(“IPO”). The two subsets of the private equity market we address are the formal venture capital and informal market for angel financing.

By limiting this discussion to those subsets, we are excluding the “buyout” fund part of the private equity market. Buyout funds tend to make highly levered (i.e., using borrowed money) investments in established businesses with strong cash flow. Participants in this market generally seek to buy undervalued assets and increase their value by improving their operating or financial strategy. The buyout industry itself has a fascinating history³ – from bargain hunters in the 1970s, to junk bond financing in the 1980s, to easy credit in the 1990s, to the recent megafunds and megadeals. Buyout firms generally maximize their returns not by funding new, high risk enterprises, but by financial engineering or changing the cost structure of existing, and usually large, companies.

In this chapter we are more interested in describing the characteristics of financing earlier stage companies. The importance of the venture capital industry to the economy cannot be overstated – by the end of 2000, over 20 percent of U.S. public companies, representing 32% of the total stock market capitalization, were companies that had been venture-backed.⁴

Historical Perspective

American Research and Development (ARD) was the first modern venture capital firm. It was founded in 1946 to commercialize applications of technologies that were developed in World War II. Under General George Doriot’s 30 year leadership, its core values were not to “make money,” but rather to finance “noble ideas.”⁵ ARD created today’s venture capital paradigm with its 1957 financing of Digital Equipment Corporation (DEC) – its \$77,000 investment became worth \$355 million over a period of 14 years.⁶

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Before 1957, most of venture capital firms were based in the Northeast. In that year, Arthur Rock traveled from New York to California to help secure financing for Eugene Kleiner and other employees of Shockley Laboratories. Rock's trail led to Sherman Fairchild (IBM's largest shareholder at the time), who invested \$1.5 million to form Fairchild Semiconductor. In 1961, Rock moved to California and started venture capital funds that invested in future industry leaders such as Intel, Teledyne, and Apple.⁷

In 1958, the Federal government created the Small Business Administration to promote the creation and development of small businesses by chartering new small business investment companies (SBICs) that would provide early stage financing to companies. In less than ten years, 700 SBICs dominated the U.S. market for risk capital and accounted for 75 percent of venture capital financing. There were some inherent flaws with the SBIC model – for example, SBIC managers tended not to be industry experts, and they evaluated investments mainly on the basis of loan repayment. But the biggest problem with the model emerged when the government tried to lever the SBIC investments by guaranteeing \$4 for each \$1 of equity capital. Since the government subsidized debt, SBICs tended to invest in more risky enterprises – ones with less certain cash flows – with more debt than equity capital. Therefore, the government guarantees created perverse incentives to the investment managers, encouraging them to use the wrong form of capital for startup and growth companies. During the subsequent economic downturn, high debt levels forced many SBIC companies into bankruptcy and the SBIC community shrank. By 1978, only 250 were active, and by 1988, SBICs accounted for only seven percent of venture capital financing.⁸

Two legislative changes drove a surge of venture capital investing in the 1980s. First, the tax rate on capital gains was reduced from 49.5 percent to 28 percent in 1978.⁹ Second, and with

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a much greater impact, was the 1979 change in the “prudent man” rule – a restriction under the Employee Retirement Income Security Act of 1974 (ERISA) that a professional investor must adopt the perspective of a prudent person seeking a reasonable income and preservation of capital to allow pension funds to invest in venture capital. Venture capital funds now had a huge new source of investment capital. By 1987, pension funds accounted for 15 percent of the \$216 million of commitments to venture capital funds; in 1998 pension funds accounted for almost half of the \$19.7 *billion* venture capital commitments. Over that period, the share of commitments made by individuals decreased from 32 percent to 11 percent.

While there has been a degree of feast or famine cyclicalness to the pattern of venture capital funding – there were significant declines after the oil embargo and again after the stock market crash of 1987 – the pumping up and bursting of the internet bubble in 1999-2001 was on a completely different scale. During that three year period, \$200 billion of venture investments were made. Excepting those three years, however, the level of venture capital investments between 1998 and 2006 has been relatively stable at between \$20-26 billion per year. And from 2002 to 2006, the share of those investments that were made in startup, seed, and early stage companies was consistently 20 percent.¹⁰

How Does Venture Investing Work?

The typical venture capital firm raises money into a specific investment fund, say Strategic Academic Opportunities I. If the initial fund is successful, the firm may raise follow-on funds, numbered II, III, etc.¹¹ The venture capital firm’s principals serve as general partners (“GPs”) of the fund, and they raise money from outside investors who are the limited partners (“LPs”). The partnership agreement among the GPs and LPs specifies the lifespan of the fund (typically 10 years) and the management fee structure. The typical management fee structure is

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“two and twenty” – that is, two percent per year of the total capital raised, plus 20 percent of the profits after the LPs have recovered 100 percent of their invested capital at the end of the fund’s life. Because of the cumulative effect of management fees, a \$500 million fund with a two percent annual management fee for ten years would only have \$400 million to invest.

Over that 10 year horizon, venture capital firms typically go through a process of fundraising, identifying and structuring investments, managing portfolios, and exiting (selling) investments. Firms that establish a track record have a much easier time raising additional capital – most new venture capital investments are made by follow-on funds of established firms. And those follow-on funds tend to outperform the initial funds.¹²

Within the capital markets universe, venture capital is just about the most expensive money there is. In evaluating investments, venture firms typically seek a 38 percent annual rate of return on their investment on a particular deal; at that compounded rate, the investment would return 500 percent over five years. In other words, the venture firm would expect a \$5 million investment to be worth \$25 million within five years. The rate of return required is directly correlated to the investor’s risk – early stage, money-losing companies are more likely to go bankrupt than large companies with substantial assets. Venture firms fully expect to “write-off” 30-50 percent of all the companies they invest in, so the winners have to experience outsized returns. By way of contrast, private equity buyout funds typically target returns in the mid-20 percents, but can afford this lower rate of return because they experience relatively few bankruptcies. Because of its even lower risk of failure, the cost of public equity capital tends to be in the teens, and the cost of debt tends to be in the single digits.

To achieve high levels of returns despite potential bankruptcies, venture capital firms seek to invest only in companies that have the potential for “home run” returns (in the thousands

of percent), such as those realized by the venture investors Yahoo! or Google. Such growth potential is most likely to exist in a big industry in which there are significant opportunities for radical innovation. In fact, the majority of venture funding has been focused on only a handful of industries, especially information technology and healthcare.

Table 1: Venture Capital Investments by Industry (2006)¹³

Industry	Total Investments 2006 (in millions)
Software	\$ 5,114
Biotechnology	4,633
Medical Devices and Equipmen	2,660
Telecommunications	2,598
Semiconductors	2,050
Industrial/Energy	1,887
Media and Entertainment	1,671
Networking and Equipment	1,075
IT Services	1,025
Electronics/Instrumentation	712
Business Products and Services	637
Consumer Products and Service	516
Computers and Peripherals	430
Financial Services	428
Healthcare Services	416
Retailing/Distribution	220
Undisclosed/Other	20
Grand Total	\$ 26,090

While the total size of the education industry is far larger than many of the sectors on the list, education does not even appear on the table. Venture investors are virtually ignoring education, most likely because of the limited potential for radical innovation in the sector.

Some Common Venture Capital Myths

The formal venture capital market has characteristics that are sometimes misperceived, and which should be understood in the context of policy prescriptions aimed at promoting targeted education industry investment.

Venture Capital Investors Invest Equity on the Same Terms as Company Founders

The venture capital investors typically invest the riskiest money, and they usually ensure that their investment is paid back ahead of the company founders. They typically structure their investments as convertible preferred stock or convertible debt. Preferred stock or convertible debt is paid back before founders, who hold common stock. “Convertible” means the investments can be converted into common stock once the initial “preferred” investment is paid back – usually once the founder’s equity is worth more than the preferred stock. These structures have several advantages for the venture investor:

- founders only receive a return on their equity if returns are high, thereby allowing venture investors to ensure that the entrepreneur truly believes in his or her aggressive business plan projections for revenue and profit growth;
- preferred shares usually have a dividend so the venture firm receives some current income while retaining the ability to convert to common equity if the investment becomes worth a lot of money; and
- the preferred stock can have a preferred dividend and a liquidation preference so the venture investors get paid first in the event of a sale or bankruptcy.

If You Send a Great Business Plan To a Venture Capitalist, You Are Likely To Get Funded

As a general rule, only 10 percent of business plans received by venture capitalists warrant any response at all, and only 1 percent ever get funded. Business plans coming in “over the transom” are the least likely to get funded: most venture investors rely on their own network of friends and business contacts to provide investment opportunities.

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The Market Opportunity and Company Strategy Are the Most Important Parts of the Business Plan

The first page most prospective investors flip to is the people page – who are the founders and managers, what have they done in the past, who do they know that can give a personal reference that can be trusted.

A Lot of Companies Receive Venture Funding

Only about 1,000 companies each year receive “first sequence” funding. That is about 0.1 percent of the approximately 1 million new businesses started every year in the U.S.

It Doesn't Matter Where You Live, As Long As Your Idea Is Good

Over a third of venture capital investments in 2006 were made in California's Silicon Valley. Adding Los Angeles, Orange County and San Diego accounts for about half of all investments. Route 128 outside Boston, New York, and Metro Washington D.C. accounts for another 25 percent.¹⁴ In other words, about three-fourths of all investment are in a few California locales, Boston, New York City, and greater Washington D.C.

Venture Capitalists Are Long Term Investors

In structuring their investments, venture investors typically provide only enough funding to allow the company to make it to the next significant milestone, at which time they can either invest more or cut their losses. The pension fund managers who invest in the funds are also evaluated monthly, quarterly, and annually, so there is enormous pressure for short term performance. As a result, investors have shifted from allocating approximately 40 percent of capital to startup, seed, and early stage companies in the 1980s to around 20 percent today. The need to realize investment returns by going public or selling the company encourages firms to

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focus on later stage opportunities that are closer to an “exit” opportunity to get strong returns sooner thereby bolstering the reputation of the investment firm.

Angel Investing

As venture firms have reduced their share of funding seed stage companies, young companies increasingly turn to the informal risk capital market known as the “angel” market. The positive connotation of “angel” suggests friendly, supportive investors that care more about the company’s future than their own investment; that may be true of some investors, but it is not a valid generalization. Angel investors tend to be wealthy individuals who invest limited (i.e., under \$1 million) into a company because it is not yet ready to receive venture capital funding. While the formal venture capital industry dates back to the end of World War II, angel-backed ventures can be said to include Queen Isabella’s and King Ferdinand’s sponsorship of Columbus’s 1492 voyage, King Louis XVI’s \$450,000 investment in the National Bank of Philadelphia, and Boston attorney Gardiner Greene Hubbard’s and leather merchant Thomas Sanders’s funding of Alexander Graham Bell and the Bell Telephone Company of Boston (after bank officers and the *Boston Post* had ridiculed Bell’s idea).¹⁵ Today, angel investors are typically wealthy individuals, doctors and lawyers, or successful entrepreneurs.

Because angel investments are harder to track and measure than those from the formal venture capital market, it is more difficult to estimate the size and impact of angel investing activity. The University of New Hampshire’s Center for Venture Research, founded by Jeffrey Sohl, estimates a total of \$25.6 billion of angel investments were made in 2006 – almost exactly the level of investments made in the formal venture capital market. While angel and venture investors are investing the same aggregate amounts, angel investments were made in 51,000 companies by 234,000 individuals – in contrast to 3,500 transactions funded by the roughly

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2,000 venture firms. That is, the average angel investment per deal was \$500,000 versus \$7.4 million for venture capital investment, and the average investment per investor was \$100,000 versus \$13 million.¹⁶

Angel investing accounts for a much higher percentage, and dollar value, of seed and startup investments – 46 percent versus four percent for the traditional venture capital industry.¹⁷ That means that the angel market accounts for *ten times* the amount of traditional venture capital invested in seed and startup companies. One reason angel investors fund earlier stage companies is their investment horizon – angel investors are more patient, and expect to hold the investment for a minimum of three to five years.¹⁸

Despite the differences in average deal size and stage of investment, there are many similar characteristics between angel and venture capital investing. The industries benefiting from angel investments are similar to those receiving traditional venture capital investments: healthcare, software, biotech, and retail.¹⁹ Convertible preferred stock, which gives more protection to the outside investors relative to the company founders, is the most common form of investment.²⁰ Angel investors also tend to invest close to home – over 80 percent of angel investments are made within a half-day's travel from the investor's home.²¹ One reason for investing close to home is the preference for angel investors to source deals and make investment decisions on a face-to-face basis²², and to spend time with the company. Another is that they tend to invest with fewer formal terms and conditions. But the biggest reasons angel investing tends to be up close and personal are that it carries relatively greater agency risk – the risk of conflict of interests between managers and investors – and prospective investments may have significant informational asymmetries between entrepreneurs and potential investors.

The Angel Capital Education Foundation, a non-profit organization founded in 2005 by the Kauffman Foundation, lists over 200 angel groups, capital source databases, and other angel resources in North America.²³ Many of these groups function as what Sohl calls angel “portals” – “organizations that provide a structure and approach for bringing together entrepreneurs seeking capital and business angels searching for investment opportunities.” He describes six different forms of angel portals: matching networks, facilitators, informal angel groups, formal angel alliances, electronic networks, and individual angels.²⁴

Matching networks evolved to feature matching databases in which the networks screen investor criteria against business plan submissions, venture forums at which pre-screened entrepreneurs make sequential formal presentations, and educational seminars. For instance, the New York Angels meets monthly to listen to vetted business plans. Outside the U.S., many of these original networks still operate (Business Angels Party Limited in Australia, Halo in Northern Ireland, and Euroregional Business Angel Network in Germany). But in the U.S., most of them have evolved into the venture forum format with published investment criteria, specific business plan submission processes, and formal screening processes that must be passed before an entrepreneur is given the opportunity to make a 30 minute presentation to the investors.

Facilitators tend to provide more educational and less formal opportunities for investors and entrepreneurs to meet in person and share experiences. Facilitators include private sector organizations as well as public-private sector hybrids. The hybrids tend to foster economic development in their geographic area – examples include International Angel Investors in Tokyo and TechInvest in Wales. In the U.S., informal angel networks such as eCoast Angels and Walnut Venture Associates tend to rely on group members to refer deals internally; formal angel alliances like the Band of Angels can have a variety of structures, some requiring minimum

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levels of annual investment, regular participation at presentations, formal voting, and pooling of funds.

Electronic networks are an intriguing form of angel portal. During the 1995 White House Conference on Small Business, the concept of forming a clearinghouse to improve access to equity capital for young, entrepreneurial companies was conceived. That concept led to the creation of the Angel Capital Electronic Network (“ACE-Net”) – an internet-based market to match angel investors with new and early stage companies – by the U.S. Small Business Administration’s Office of Advocacy. The target size for the investments was \$250,000 to \$2 million, on the assumption that investments of less than \$250,000 were likely to be made by friends and family while investments of greater than \$2 million were being made by the formal venture capital market. The SBA also sought to broaden the availability of early stage financing beyond the concentration of industries and geographies of the formal venture capital industry. In 2000, the SBA spun off ACE-Net into a university-based operation, and in December 2004, ACE-Net became Active Capital. Overall, electronic networks have as their principal weakness the preference for angel investors to be up close and personal in order to manage the agency risk of their investment.

The opportunity to establish an education industry-specific angel portal appears to be a potentially effective mechanism to promote angel investing in the sector, as well as a good way to create some of the human capital networks addressed in other chapters in this volume. This concept is explored further as a model in a later section of this chapter.

Why is K-12 Different Than Post-Secondary?

The U.S. K-12 and higher education sectors have vastly different public perceptions of their overall effectiveness. They also have dramatically different investment characteristics.

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Despite the higher total spending on K-12 education than on postsecondary education, investment dollars have flowed disproportionately to colleges, universities, and the companies that service them. Over 1 million Americans attend the 2,561 for-profit post-secondary schools; nine companies running hundreds of schools are publicly traded for-profit colleges (many of which had previously been venture-funded) that now have approximately \$25 billion of market capitalization.²⁵

In 2005, there were \$300 million of mergers and acquisitions in the post-secondary industry and only \$64 million in the K-12 sector; 82 percent of all K-16 investment dollars in 2005 flowed to post-secondary. But the amount of money invested in solutions companies (those that provide services to K-12 institutions and colleges) was approximately the same. So while companies servicing post-secondary institutions and K-12 districts attracted similar levels of investment, few investors will seriously consider investing in K-12 schools and in the delivery of K-12 education.²⁶ As a result, there is no for-profit operator of a K-12 school system with over a billion dollars of market value. Without industry leaders and scarred by years of failure, investors tend to shy away from K-12 investments. One notable example was Edison Schools Inc., which had a market capitalization in excess of \$1.5 billion at the time when investors perceived its school management system to be radical, transformative, and welcome; but which was acquired only a few years later by a private equity investor for approximately 10 percent of its peak stock market value. Another potential example of transformative secondary school delivery is K12 Education, an online education company (backed by Michael Milken's education industry investment vehicle Knowledge Universe) that serves home-schooled and virtual charter school students. K12 filed registration papers to go public in the fall of 2007 and will likely attract Wall Street interest. But these are rare exceptions.

Why do investors focus almost exclusively on post-secondary education? There are four main reasons why investors have poured billions of dollars of capital to improve and modernize the delivery of post-secondary education, but have virtually ignored K-12 schools:

- the federal government student loan and grant programs function like a voucher system that encourages competition amongst all players and generally does not discriminate against for-profit providers;
- for-profit providers have carved out market niches that are not addressed by traditional non-profit institutions;
- there is broader acceptance of for-profit operators in post-secondary education; and
- the cost structure of higher education provides greater operating leverage – that is, direct instructional expense is lower as a percentage of revenue, so there are greater economies of scale.

The “Student Loan” Voucher System

The federal government supports the post-secondary education of its citizens by providing approximately \$85 billion of (primarily) subsidized loans and grants each year. Students can use these federally subsidized loans at any accredited institution.²⁷ Students apply for financial aid, which is disbursed on determined by a need based formula.

With the exception of the accrediting hurdle, the government imposes no restrictions on how that tuition money is spent, and there is only slightly greater regulation of for-profit providers. This voucher system has fostered a competitive environment even amongst the top universities. Harvard and Stanford compete aggressively for the world’s top talent, while the University of Phoenix and Strayer Education compete to serve America’s working adults.²⁸

For-profits Have Sought Out Niches Underserved by Traditional Institutions

When most scholars and policy analysts think about post-secondary education, there is still a dominant notion that universities serve young adults, aged 18 to 25, who focus a reasonable portion of their time and attention on scholarly pursuits. But the largest and fastest growing segment of America's college population is "non-traditional" students. Sixty-three percent of all students attending for-profit colleges are over 25 years old, whereas approximately 40 percent of students in traditional colleges are over 25. The average age of a student at a for-profit college is 27.3 years old; 42 percent of such students are white and only 39 percent are male.²⁹

Traditional schools – even community colleges – have shied away from serving this population. Instead, virtually every non-profit and state school has focused its attention on gaining ground in the *U.S. News and World Report* rankings by competing to attract top ranked professors and raise the SAT scores of their applicants. Meanwhile, for-profit colleges targeted a new segment of student: working adults more interested in furthering their career than in receiving a traditional liberal arts degree.

For-profit colleges also embraced technology before their non-profit peers. Today, 10 percent of all post-secondary degrees are granted online and for-profit colleges have a disproportionate market share, estimated at 30 percent. The University of Phoenix alone enrolls approximately 200,000 of the country's 1.2 million online students. Meanwhile, observers estimate that 55 percent of all online learners are aged 26 to 45—the non-traditional niche that for-profits are serving.³⁰

Broader Acceptance of For-profit Providers in Post-secondary

While for-profit colleges and universities still face significant discrimination, there is a long history of private operators of post-secondary institutions that makes the presence of for-profit operators less controversial. K-12 education is more politically charged due to its role in our nation's history as a leveling force for social equality, its emphasis on local control, the greater strength of K-12 teachers unions, and the age of its students. It is important to note that for-profit colleges have suffered a large number of scandals over the years and much criticism of the for-profit sector is well deserved. While that criticism has resulted in some increased regulations (e.g., the rules that no more than 90 percent of an institution's revenue can come from federal grants and loans, and limits on each institution's loan default rates), the federal government has continued to fund student attendance at for-profit colleges. At the local level, certain states and municipalities have restricted the operations of for-profit colleges. Most states have separate rules governing the operations of schools within their borders. However, these restrictions have not overly constrained the growth of for-profit providers.

The Cost Structure of Higher Education Provides Opportunities for Higher Returns on Investment

Running a college or university is fundamentally a more profitable business than running a K-12 school because the cost of instruction is lower. The economics of Strayer Education, one of the more successful publicly traded for-profit colleges, compare favorably to those of even the most successful K-12 school operators:

Table 2: Cost Structure (as Percent of Revenue) of K-12 Versus Post-Secondary

	K-12 ³¹	Strayer ³²
Instruction	65%	35%
Selling and Promotion	5%	15%
General and Administrative	25%	15%
Profit Margin	5%	35%

While for-profit colleges must spend about 15 percent of their revenue on marketing, their total education spending as a percent of revenue is significantly lower than K-12 operators. Students pay for their own books, go to class day and night (optimizing space usage), and require less day to day guidance. But the biggest difference is the percent of revenue spent on instruction, specifically personnel. Because of class size and the amount of time students spend in class, colleges spend a lower percentage of their revenue on personnel. The math is simple:

- Price paid per student per class: \$1,500
- Students per class: 25
- Average revenue per class: \$37,500
- Average pay of instructor per class: \$5,000

Conversely, a K-12 school will receive about \$7,000 per student, be able to put 20 students in a class, but have to support a full-time teacher at the same \$50,000-\$60,000.

Investors are generally attracted to higher margin, lower capital requirement opportunities. With its low margin structure, K-12 education providers are generally less attractive than post-secondary education providers.

Ecosystem of Capital and Entrepreneurs

As a result of these four key drivers, entrepreneurial efforts have exploded in post-secondary education. The rapid expansion of the for-profit sector, coupled with the efforts of entrepreneurial non-profit schools, has created an ecosystem of entrepreneurs and capital to solve real world problems in post-secondary institutions.

For example, new generations of student information systems have sprung up alongside enrollment management companies. E-College (recently acquired by Pearson), Embanet (recently acquired by Knowledge Universe) and Blackboard (NASDAQ: BBBB) compete to bring courses from both traditional and for-profit schools online. At the same time, enrollment management companies like Plattform have developed to service the growing needs of colleges as they try to attract students in an increasingly competitive market for students.

America's colleges and universities are generally considered among the world's best, but its K-12 system is considered mediocre, at best. While a wholesale restructuring of K-12 school finance is unlikely, there are numerous other ways that the government and foundations can foster a spirit of entrepreneurship and capital deployment in the K-12 sector.

It is highly unlikely that the economic structure of K-12 education will mirror that of post-secondary education. Rather than get disheartened, supporters of supply-side school reform should understand the factors driving success in post-secondary investments to develop concepts that can be applied to the K-12 sector. One of the most powerful concepts is the focus on niche areas of education that are less competitive. Currently, private investors are focusing significant resources in certain areas of K-12; for example, companies that run programs or services for children with learning disabilities – an area traditional school systems have tended to avoid. Similarly, K12.com, which provides online education, is planning an initial public offering.

Focusing attention on niche areas will start to develop the ecosystem required for supply-side school reform. When University of Phoenix started 30 years ago in a single classroom in California serving working adults, no one expected it to become the nation's largest private university. By focusing efforts on such incremental changes, governments and philanthropists can make some significant changes to increase the role of market forces in the K-12 system. The following section proposed three mechanisms that could help create the ecosystem required to create supply-side solutions in K-12. These proposals are:

- implementing a “prize” model for success in niches;
- creating a subsidized education investment firm; and
- developing an angel portal for education.

The Prize Model: Creating a Pay for Performance Market in Education

The X Prize Foundation calls itself “the leading model to leverage the elements of public interest, entrepreneurial spirit and cross-disciplinary innovation to bring about breakthroughs that benefit us all”.³³ It points to the success of the \$25,000 Orteig Prize offered to the first person to fly non-stop between New York and Paris. The prize was won by Charles Lindbergh, but the offer stimulated the efforts of nine different teams, which collectively spent \$400,000 to win the purse – sixteen times the proffered amount. In the meantime, these initial efforts and investments catalyzed the development of the \$250 billion aviation industry. X Prize's founder, Dr. Peter Diamandis, estimates that in the prize model, “ten to 40 times the amount of money gets spent” relative to the prize.³⁴ Other notable prize offerings include the Gates Foundation and others' Advance Market Commitments to stimulate vaccine production and Sir Richard Branson's Virgin Earth Challenge to award \$25 million to the inventor of a commercially and environmentally viable method of removing greenhouse gases from the atmosphere. While

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definition of a clear and measurable outcome in the social sciences is more challenging, the following example illustrates how the model could be applied to solve an important problem in education.

Advocates of educational entrepreneurship and the creation of market forces in the delivery of K-12 education in the past 10 to 15 years have focused their attention on charter schools and vouchers. Charter school enrollments have grown steadily to about 1.1 million students in the 2006-07 school year, but at that level still only represent 2.0 percent of total K-12 enrollment.³⁵ The optimistic advocates of system reform might say that in 1970, virtually no foreign automobile manufacturers sold cars in America, but by 2000, 40 percent of all cars sold in the United States were imports.³⁶ Pessimistic observers might counter that K-12 does not function like a consumer market, and that student achievement results for charter schools are uneven.

Instead of focusing on systemic reforms that are highly politicized and open to subjective evaluation, advocates of market forces could attempt to leverage the concept of a prize to promote a simple educational market that works – for example, one that creates a “prize” for achieving a social good.

It is difficult to imagine putting up a \$10 million “prize” for, say, improving reading scores for 3rd graders in the Philadelphia School District. Who would receive the prize? Parents, teachers, the school, or the curriculum provider? Instead, education could focus “prizes” on organizations that achieve specific educational outcomes that can be easily measured – for example, high school graduation.

High school graduation is the Holy Grail for many education policy makers – high school graduates have basic skills that help them spend more time employed and less time in prison or

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on welfare. Educating someone to the level of high school graduate has one of the highest returns on investment (“ROI”) for an individual and society of any investment in education spending. However, our education system does not reward high school graduation. In fact, most school districts have a variety of policies that allow drop-outs to slip through the system. This disparity between the economic return of graduation and reward structure creates one of the most compelling examples of distorted incentive structures between outcome and investment required. High school graduation could therefore be a test case for a prize model because there is such a high potential return on the program sponsor’s investment. The average income of a high school graduate is \$7,000 (or 30 percent) higher than a high school drop out, and high school graduation yields a 7.8 percent increase in full time employment.³⁷

The social cost to a high school dropout is even more pronounced than the economic gain to the individual. Professor Henry Levin of Teachers College, Columbia University, estimates that each high school dropout costs American society an incremental \$209,100.³⁸

Table 3: Cost of High School Dropouts

Category	HS Dropout Cost	Notes
Lost Tax Revenue	\$139,100	Graduates earn more and therefore pay more in taxes.
Health Care	\$40,500	Dropouts are significantly more likely to go on Medicaid and are statistically sicker than graduates.
Criminal Activity	\$26,500	Dropouts are about 20 percent more likely to commit violent crimes and end up in prison than graduates.
Welfare Payments	\$3,000	Dropouts are more likely to end up on welfare.
Total Cost	\$209,100	

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The problem of low high school graduation rates is not a minor one – most experts agree that approximately 30 percent of Americans do not graduate from high school.³⁹ The prospects for dropouts are grim – prison systems are said to estimate the number of beds required by projecting the number of high school dropouts.

High school graduation would be a strong candidate for a test case for a prize-based pay for performance of educational entities because it is relatively easy to track success at the local level (high school graduation is defined by each state, and, to a certain extent, the federal government through the General Equivalency Diploma, or GED, program) and because thousands of community based organizations (“CBOs”) already deliver many of these services on an ad hoc basis. Many CBOs struggle to raise funds to save children from the streets; with adequate funding opportunities, the most successful of these programs would grow to fill the demand. There would be a significant shift in the funding world: instead of debating the efficacy of each program, the market would sort out the most successful programs and fund the outcome.

Establishing such a program would be relatively straightforward. A government or foundation could first announce the concept that there would be a “prize” of \$10,000 paid to an educational provider for each high school dropout that went through a course offered by the educational provider, and received the skills necessary to become a high school graduate. The sponsoring organization would certify providers that wish to offer such services, in a consistent and transparent way, to control quality. Once registered as a provider, any education organization would receive a small fee to cover the costs of offering a single course (for example, a small fee for each three credit course completed by a high school drop-out). The fee, say \$200, would be enough to pay the basic costs of operations. Each successful course

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completion would be tracked online and the school district would ensure that the student had not received credit for the course previously. Upon completion of high school diploma as defined by existing state standards (e.g., passing the state level exam or GED), the provider would receive a prize of \$10,000.

The impact of such a program would be immediate, with the potential prize model effect of substantial multiples of the bonus being invested to solve the problem. Organizations like the Boys and Girls Clubs that already offer such programs would register and get an income stream for providing the services they already offer – and they would likely invest in improving quality. Entrepreneurial school districts might start their own programs serving students from outside their district to gain extra income. For-profits and other competitors would likely develop. Companies and school districts with the best high school recovery model would attract investors to fund growth. Before long, educational providers will be advertising to attract drop-outs back to class. Imagine right next to all those ads for “University of Phoenix”, advertisements geared towards 11th grade drop-outs urging them back to school.

Running the program would not take disproportionate dollars away from existing programs. A pilot program, even in a district with 65,000 students, would likely cost approximately \$10 million and – if the numbers above are correct – save society countless woes, not to mention over \$160 million in future expenses.⁴⁰

The creation of a high school graduation “market” would be significantly more capital efficient than the tens of millions spent on supplemental educational services (“SES”) under the No Child Left Behind Act. Most policy makers are unsure of the success of SES partially because there are no clear metrics to judge effective programs. There is no generally accepted benchmark test to evaluate efficacy of the tutoring. Even if a benchmark test existed, students

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are enrolled in school so evaluators must parse out the relative success of SES or the classroom experience. Drop-outs have no alternative source of education, and success is measured by established state norms for high school graduation. Finally, note that all school districts, even failing ones, could be eligible for the program. So school districts themselves would have an incentive to start and support these programs to capture additional revenue.

Today, dropouts are virtually forgotten by the traditional school systems. By rewarding institutions that enroll drop-outs and turn them into graduates, there would be competition to service 11th grade drop-outs. And in the process, American society would reap a massive return on investment – \$209,100 minus the cost of running the program.

Creating a Portal to Increase the Efficiency of the Angel Market in Education

A second model that could be employed to increase private capital investment in K-12 education is the creation of an angel portal. The angel investing market, as described above, is as large as the formal venture capital market. One way to promote angel investing in K-12 opportunities is to smooth out some of the inefficiency – the high costs of matching innovators, entrepreneurs, and investors – in the market for education-related angel financing. This section explores how an education industry angel portal – sponsored by government, a foundation, or other non-profit organization – might catalyze seed and early stage investment in K-12 opportunities.

There is an active precedent in the U.S. for a government department to create a portal to attract private investment to facilitate investment in the areas it targets. The Defense Venture Capital Initiative (DeVenCI)'s goal is “to speed Department of Defense adoption of promising new commercial technologies, and to encourage broader commercial support of the Department of Defense supply chain.”⁴¹ It was founded on an experimental basis after the 9/11 terrorist

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attacks, and by the end of 2005 its participants had made suggestions that led to the adoption of 15 technologies for military and intelligence uses. Based on its initial success, in early 2006 the Department of Defense expanded the project, funded an office with four full-time staff, and signed up 11 venture capitalists from 30 applicants to serve two-year terms. Bob Pohanka, DeVenCI's director, calls it a "search engine."⁴²

There are many examples of public sector-sponsored portals (some with private co-sponsorship) in other countries. Sohl has analyzed the research on many of them, including Canada Opportunities Investment Network (COIN), Local Investment Networking Company (LINC) in the United Kingdom, Chalmers Venture Capital Network (CVCN) in Sweden, Business Introduction Service (BIS) in Denmark, Matching-Palvelu in Finland, and Business Angel Network Deutschland (BAND). He concludes that the success of these organizations is mixed. Successful portals, he found, are regional and provide for face-to-face interaction between the angels and the entrepreneurs; they undertake marketing efforts to increase awareness; they conduct screening and develop criteria to ensure the opportunities are investor-ready; and they remain portals and do not become investment funds.⁴³

A new education industry portal – called it AngeEd – would draw on some of these recommendations. It should focus on the linkages between the innovator and the entrepreneur – not unlike the Angel Investors of Greater Washington, a portal that focuses on using federal lab and university liaisons to help entrepreneurs commercialize federally funded research and development. Perhaps the portal could be an offshoot of the Institute of Education Sciences, the research arm of the Department of Education. (Of course, increased funding of basic research, the purview of the IES, is a no-brainer policy prescription for increased commercial development

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of that research.) If federal policymakers won't take the lead, a sufficiently large state—say California or Texas—or consortium of several states could undertake the effort.

AngelEd is well suited for government or foundation sponsorship because of the investment and cost of marketing and screening that would need to be undertaken (probably in the zone of \$10 million) and the importance of giving the portal the proper exposure and profile. Given the growing university linkages between graduate business schools and education schools – notably at Stanford and Harvard Universities – a potential source of subsidized screening talent may be provided by graduate students. One other potential feature of AngelEd would be to provide matching funding to leverage third-party investment dollars. The lessons of the SBIC policy notwithstanding, there are examples of monetary incentives that have worked, including the Scottish Enterprise Business Growth Fund and the Scottish Co-investment Fund (which accounted for seven percent of total early stage company investment and 55 percent of all deals recorded in 2004, which a significant increase in average deal size⁴⁴).

AngelEd could also connect entrepreneurs to the end customers. Through the portal, for example, entrepreneurs might be able to give products away for free or at low cost to a network of “early adopter” teachers or school systems. These early adopters could serve as a test of the product's efficacy and help investors make better decisions based on the results of the “field tests”.

There is substantial evidence to support the idea that angel investment in K-12 could be increased and be made more efficient through the successful creation of AngelEd. The lessons of ACE-Net, DeVenCI, and other international angel investment portals, along with input from knowledgeable foundations like Kauffman, should all be taken into account in its design, in order to maximize the success of such a portal.

Creating a Principal Firm to Co-Invest in Education

In the late 1990s, the CIA realized that the nation's intelligence agencies were not accessing the rapidly expanding field of technology companies. Large companies like Boeing received the vast majority of contracts, while small companies had trouble navigating the complex web of government procurement policies which seemed "custom made to discourage innovation".⁴⁵ As a result, the CIA did not have access to the latest technologies, and entrepreneurs did not realize the potential value of their products.

The CIA (and later other agencies) decided to create and fund In-Q-Tel, a "venture capital" firm to invest in businesses that may prove useful to the intelligence services. In-Q-Tel was built to invest *alongside* other venture capital firms to avoid the government "picking" winners, investing in as many companies as possible that will improve national security, and introduce new ideas to government bureaucracies without committing too much capital. Successful investments have been made in companies that have a product and team that would be successful on its own, but In-Q-Tel's capital and expertise facilitate the growth and development of products for the agencies. In-Q-Tel structures investments in a variety of ways including debt, equity, and pay-for-development of specific services. To date, In-Q-Tel has invested in over 60 companies. It has a ten person staff in the Silicon Valley and 50 more in the Washington, DC area.

What makes In-Q-Tel successful, though, is that it does much more than just invest dollars. It also works closely with companies to bridge the gap between Silicon Valley (or other dynamic locales) and the CIA's headquarters in Langley, VA. In-Q-Tel's staff includes senior level investment professionals and technologists from the highest ranks of the intelligence community, who can cross the gap between the business and government cultures. The board of

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directors ranges from the President of Arizona State University, to a former Secretary of Defense, to the former CEO of Lockheed Martin. These staffers, board members, and advisors help guide the development of technology and interface with the various government agencies to help them buy products.

Each year, Congress appropriates funding for In-Q-Tel and it recycles some of the profit from its investments in new companies. Based on the success of In-Q-Tel, Congress has funded similar programs run by the Department of Defense and NASA.

The education industry faces a similar problem: how to encourage entrepreneurs to focus on education and then attract capital so these companies can grow. Access to capital is not necessarily the issue for education entrepreneurs. There are a large number of small education companies that receive some capital. Where education companies stumble is the growth from a small company to one of the size and scale. In education, it is difficult to “cross the chasm” from a small company to a big company. The long sales cycles – that is, the time from the initial sales meeting to the contract signing – faced by companies trying to sell to government security agencies is not dissimilar to, and quite possibly worse, than those faced by young education companies.

The single largest issue faced by growing education companies is the sales cycle inherent in selling to school districts – except that an education company must experience the long sales cycle each time it approaches one of the nation’s 10,000 school districts. Each district has its own procurement bureaucracy, standards for buying products, and curricular program. The average sales cycle for each district is greater than 12 months – an eternity for a startup. At a minimum, school districts could agree on a common procurement platform similar to the ones created by the Department of Defense.

However, America's educational establishment could go one step further. The Department of Education, or even a consortium of states or school districts, could create an In-Q-Tel in the education industry. Call it EduFund. However, there are a few key structural differences between the defense technology industry and education. First, there is only a limited eco-system of venture capital and private equity firms focused on education. Second, K-12 education businesses tend to have fewer opportunities for venture capital like returns. And third, not even the largest school districts have the scale of the federal government in purchasing.

Therefore, the creation of EduFund would require creative thinking and structuring. The first step would be to focus on what types of companies EduFund would target and the mechanism for funding them. Some possibilities include:

- employ a funding model akin to the World Bank type of an equity investment: EduFund needs to receive a return on investment, but without the home run equity returns in some parts of its portfolio, it may be difficult to realize the 20+ percent returns that most private investors target;
- focus on enabling technologies (curriculum, software, etc.) rather than creation of school or delivery of education. Or vice-versa;
- create a network of 10 to 20 of the largest school districts to “fast-track” purchase of services from EduFund portfolio companies;
- focus EduFund activities on high need areas of school districts (e.g., special education software, remedial education, longitudinal student data tracking);
- only fund companies with a minimum revenue hurdle (say, \$1-2 million) that are investor-ready and poised for growth; and

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- build network of venture and private equity firms to co-invest with. (Do not invest without a partner).

Conclusion

Huge flows of private capital fund promising companies through the formal venture capital market and informal angel investment market every year, but very few of those dollars flow to the K-12 sector because of its limited potential for radical innovation. The history of policy efforts to promote private capital investment is mixed at best. The biggest boon to increase private capital investing generally was the ERISA reform that allowed pension funds to invest in venture funds; less important policy tools included a reduction in capital gain tax rates. The SBIC example highlighted the delicate nature of creating such incentives. A warning to policy makers seeking to promote private capital investment in K-12 is to ensure they don't try to solve a problem that doesn't exist – that is, trying to increase the supply of venture capital without changing the structural constraints of the K-12 industry that limit the potential returns on investment for that capital.

Yet there are several models that could be employed to increase such investment within the existing constraints of the K-12 industry. This paper addressed three specific ideas: a prize model to generate high levels of investment to solve problems with a specific outcome (like high school graduation); the creation of an angel portal to improve the efficiency of angel investing in K-12 opportunities and promote such investment; and a co-investment model to increase traditional venture funding of education opportunities and give its sponsors a window on innovations that could have a substantial impact on the K-12 sector. These models, if constructed with careful research on the lessons of analogous examples from other industries,

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could effectively and efficiently catalyze an increase in the flow of private capital to the K-12 sector.

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- ² Janet Hickey, personal interview, March 6, 2007.
- ³ Thomas Boulton, Kenneth Lehn and Steven Segal, "The Rise of the Private Equity Market," prepared for The Brookings-Nomura Conference on New Financial Instruments and Institutions; Opportunities and Policy Challenges, Washington, DC, September 12, 2006.
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- ⁶ Gompers, "A Note on the Venture Capital Industry," p. 6.
- ⁷ *Ibid*, p. 7.
- ⁸ *Ibid*.
- ⁹ Pension funds do not pay income tax and are therefore not sensitive to changes in the capital gains tax rate.
- ¹⁰ PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association/MoneyTree Survey, Investments by Year and by Stage of Development, retrieved August 4, 2007 from <https://www.pwcmoneytree.com/MTPublic/ns/nav.jsp?page=notice&iden=B>.
- ¹¹ Note that each fund may have different investors and even different managers. For example, a Fund could have five partners, but after the first fund, one of the five partners retires and the other four partners raise Fund II. Similarly, an investor may invest in one or the other fund.
- ¹² Kaplan, Steven N. and Schoar, Antoinette, "Private Equity Performance: Returns, Persistence and Capital Flows" (November 2003). MIT Sloan Working Paper No. 4446-03; AFA 2004 San Diego Meetings. Available at SSRN: <http://ssrn.com/abstract=473341> or DOI: 10.2139/ssrn.473341.
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- ²⁵ "Education and Training – September 2006", BMO Capital Markets, p. 81.
- ²⁶ "Education Investor", Eduventures, p. 3.
- ²⁷ The Department of Education has "outsourced" the accreditation process to regional and national bodies that monitor education quality.
- ²⁸ For more on the student loan industry, see the American Enterprise Institute's 2007 volume "Footing the Tuition Bill".)
- ²⁹ Education and Training, BMO Capital Markets, September 2006, p. 82.
- ³⁰ *Ibid*, p.168.
- ³¹ Based on authors' experience.

³² Strayer Education Inc., 2005 Annual Report.

³³ Retrieved from <http://www.xprize.org/about/index.html>.

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³⁵ BMO, p. 58

³⁶ Carnegie Foundation Globalization Project, retrieved from <http://www.globalization101.org/index.php?file=issue&pass1=subs&id=8>, October 5, 2007.

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³⁸ Retrieved from http://www.cbcse.org/media/download_gallery/Leeds_Report_Final_Jan2007.pdf, October 5, 2007.

³⁹ The Silent Epidemic, Gates Foundation.

⁴⁰ Of the 65,000 students, there are approximately 5,417 students per grade. In each grade, about 30% drop out. Thus 1,625 students would be eligible, but only about half of those would graduate at an average cost of \$10,000 per student.

⁴¹ Retrieved from <http://devenci.dtic.mil/pdf/Overview.pdf>, October 5, 2007.

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