

## Historical Returns in Angel Markets

Recently, interest in startup investments has motivated at least eight large studies in the US and UK to examine the historical returns in the business angel market. The average return across all these studies was **27.3%**:

Date Published	Study	Total Investments	Exited Investments	IRR
2007 US	Wiltbank & Boeker: "Returns to Angel Investors in Groups"	3,097	1,137	31.4%
2009 US	DeGennaro & Dwyer: "Expected Returns to Angel Investors"	603	434	33.0%
2007 US	Villalobos & Payne: "Startup Pre-Money Valuation: The Keystone to Return on Investment"	117	117	24.3%
2008 US	Sohl: "The Angel Investor Market in 2007: Mixed Signs of Growth"	Unknown	Unknown	27.7%
2009 US	Sohl: "The Angel Investor Market in 2008: A Down Year in Investment Dollars But Not in Deals"	Unknown	Unknown	22.0%
2009 US	Band of Angels Website FAQ	200+	Unknown	18.0%
2002 UK	Mason & Harrison: "Is it worth it? The rates of return form informal venture capital investments"	372	128	37.4%
2009 UK	Wiltbank: "Siding with the Angels: Business angel investing - promising outcomes and effective strategies"	1,080	406	24.6%

These studies further reveal that most of the returns came from only 5% to 10% of investments—the cases where the startup became very successful. Most startups failed, resulting in a total or near-total loss of the invested capital. By modeling the distribution of individual startup outcomes that reflect this evidence, we have determined that a portfolio of angel investments should have included at least 100 investments to adequately mitigate against the historical level of idiosyncratic risk.

The implications for research are twofold:

- Any study that analyzes the returns of the angel market should evaluate an investment portfolio of more than 100 investments to achieve statistical relevance.
- All statistically relevant research studies performed over a similar investment time period in the same region should produce similar answers to the question of return.

All the studies listed above meet the 100 investment threshold. The variance in IRR across the studies is relatively low considering that the investment time frame and in two instances the country are not constant. Furthermore, the underlying dynamics that drove returns were also quite consistent. In studies that provide data on individual investments, most resulted in failure. A small percentage of investments, usually in the single digits, provided the majority of the liquidity. This evidence supports the conclusion that a large seed portfolio would have had reasonably high returns.

More detailed analysis of each study follows.

### **“Returns to Angel Investors in Groups”<sup>1</sup>, 2007**

The Ewing Marion Kauffman Foundation and the Angel Capital Education Foundation funded this study by Robert Wiltbank of Willamette University and Warren Boeker of the University of Washington. The study includes investment data from 539 angel investors that belonged to 86 angel groups. These 539 investors made 3,097 investments, 1,137 of which had experienced exits. To our knowledge, this is the largest data set of angel investments ever collected and analyzed.

Of the 3,097 investments:

- 90% were made after 1994
- 65% were made after 1999

Of the 1,137 exits:

- 8% occurred prior to 2000
- 30% occurred between 2000 and 2003
- 60% occurred after 2003

52% of all investments resulted in a negative return, most of these with a total loss of invested capital. 7% of investments returned greater than 10X to investors.

Wiltbank and Boeker calculate the average IRR of all exited angel investments as 27%.

However, they calculate the average return by weighting each investment the same, regardless of the length of time to exit.<sup>2</sup> Because higher IRR investments generally take longer to exit than lower return exits (i.e., failures occur faster), this method of calculation underestimates the true portfolio return. A more accurate estimate of IRR can be obtained by taking the average return multiple (2.6X) and the average holding period (3.5 years) and calculating the resulting IRR. This yields an IRR of 31.4% across the 1,137 exited investments in the study.

### **“Expected Returns to Angel Investors”<sup>3</sup>, 2009**

The Federal Reserve Bank (FRB) of Atlanta published this report by Ramon DeGennaro of the University of Tennessee, Knoxville and Gerald Dwyer of the FRB. DeGennaro and Dwyer use a subset of the 3,097 investments in the Angel Investor Performance Project database, the same source used by Wiltbank and Boeker. DeGennaro and Dwyer evaluated the entire dataset and determined that 603 records contained enough information about the lifecycle of the investment for the authors to perform their analysis.

DeGennaro and Dwyer calculate that the expected return by investors for these investments was 57.8% per year. Expected returns are important because they drive investment decisions, but they are often very different than realized returns. The authors also performed a detailed value-weighted analysis of realized returns across the 434 investments that had exits and determined the IRR was 33%.

## “Startup Pre-Money Valuation: The Keystone to Return on Investment Ventures”<sup>4</sup>, 2007

The Ewing Marion Kauffman Foundation published this article by William Payne and Luis Villalobos. Villalobos is the founder and Payne is a member of Tech Coast Angels, one of the most prolific angel groups in the US. The article examines the dynamics of return generation within a portfolio of angel investments. The authors state that, “...a large, diversified angel portfolio should provide an IRR of at least 25 percent per year.”

The article then analyzes a combined portfolio of 117 angel investment made by four angel investors. The average investment size was approximately 85k. 68% of the investments resulted in a break-even or negative return. The total cash returned to the four investors from the portfolio was \$51.1 million, a 5X return on invested capital. The authors divide the exited investments into 5 different categories based upon the ROI multiple:

<u>ROI Multiple</u>	<u>Number</u>	<u>Amount Invested</u>	<u>Liquidity Amount</u>	<u>Avg. Time to Exit</u>
0	31	\$2,291,525	\$ -	2.6
>0 to <1	26	\$3,812,914	\$ 1,878,426	3.6
1	23	\$ 671,422	\$ 671,422	2.0
>1 to 10	21	\$1,870,541	\$ 5,614,653	5.0
>10x	<u>16</u>	<u>\$1,290,132</u>	<u>\$ 42,927,748</u>	8.6
	117	\$9,936,534	\$ 51,092,249	

Using the data above, we calculate the IRR from this sample as 24.3%.

## “Angel Investment Market”, 2007 and 2008<sup>5</sup>

The Center for Venture Research (CVR), currently led by Jeffrey Sohl, has conducted research on the US angel market since 1980. For the past decade, CVR has published estimates of angel activity in the US. CVR uses bi-annual surveys to sample a large number of angel groups and then extrapolates market-wide metrics such as overall market size, number of deals, number of active and inactive angel investors, participation by stage (e.g., seed, startup, late stage), and participation by sector.

Starting in 2007, CVR began tracking and publishing return data on the basis of exit-year vintage—all investments that exited in a given year. An exit is defined as any investment that comes to an end through bankruptcy, merger and acquisition, IPO, etc. For 2007 and 2008, CVR's IRR estimates are 27.7% and 22.0%, respectively.

## Band of Angels Website FAQ<sup>6</sup>

The Band of Angels is an angel group based in Northern California. The group has more than 125 members and has invested over \$186M into over 200 companies since 1994. According to the FAQ on their website, "...the cumulative IRR for all band investments since inception, including the losses suffered through the bust, is a positive 18%."

## "Is it worth it? The rates of return from informal venture capital investments"<sup>7</sup>, 2002

Colin Mason and Richard Harrison published this study in the Journal of Business Venturing. It analyzes returns from 128 exited investments made by 127 UK-based angel investors. Most of the investments occurred in the 1980s (48%) or the 1990s (38%), though a handful date back to the 1960s and 1970s. 90% of the exits were fairly recent, occurring after 1985. Since the study was originally submitted in April 1999, it is reasonable to assume that the latest exit in the study probably occurred in 1998.

Mason and Harrison report that almost half of all investments (47%) were break even or worse. They subdivide the investments into 5 performance-based groups and provide some aggregate data for each group:

<u>IRR</u>	<u>% of Portfolio</u>	<u>Median Time to Exit</u>
Negative	39.8%	2 years
0 - 24%	23.8%	6 years
25 - 49%	12.7%	6 years
50 - 99%	13.3%	4 years
100+%	10.2%	4 years

We can make a conservative IRR estimate for the entire portfolio by making the following five assumptions:

- All negative IRR investments are total losses (very conservative)
- All 100%+ IRR investments average exactly 100% IRR (very conservative)
- The average IRR of the other three ranges is the mid-point
- Each investment is the same size
- The median time to exit for each group is also the mean time to exit

The resulting calculation yields an IRR of 37.4%.

## **“Siding with the Angels: Business angel investing – promising outcomes and effective strategies”<sup>8</sup>, 2009**

Robert Wiltbank conducted this comprehensive study on UK angel investor returns using a methodology similar to his US study. He surveyed active UK angel investors, all members of angel groups. 158 investors completed surveys, representing 1,080 investments, 406 with exits. Part of Wiltbank’s survey protocol required that exits occur in 2001 or later. 30% occurred between 2001 and 2004 and 70% occurred 2005 and 2008.

56% of the exits result in negative returns, mostly total losses. 9% of the exits provided a greater than 10X return on investment. Using an equally-weighted method of determining IRR (ignoring the amount of time each investment was held), Wiltbank calculates an average IRR of 22% across the portfolio of 406 exited investments. As we have previously mentioned, this method of calculation inherently underestimates the true IRR. A more accurate estimate of IRR uses the average return multiple (2.2X) and the average holding period (3.6 years). This approach yields an average IRR of 24.6%.

### **Conclusion**

The average return across eight large research studies on angel investment returns within the US and UK was 27.3%. Furthermore, even though the investment time frame and country are not constant across all of the studies, the underlying dynamics that drive angel portfolio returns are remarkably consistent. Thus, it is highly likely that the composite portfolio represented by these studies is an accurate gauge of the long-term historic returns of the US and UK angel markets.

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<sup>1</sup> Wiltbank, Robert and Boeker, Warren, “Returns to Angel Investors in Groups”, Ewing Marion Kauffman Foundation and Angel Capital Education Foundation, November 2007.

<sup>2</sup> DeGennaro, Ramon and Dwyer, Gerald, “Expected Returns to Angel Investors”, Federal Reserve Bank of Atlanta, March 2009, <[http://www.clevelandfed.org/research/Conferences/2009/3-12-2009/DeGennaro\\_Dwyer-Revised.pdf](http://www.clevelandfed.org/research/Conferences/2009/3-12-2009/DeGennaro_Dwyer-Revised.pdf)>.

<sup>3</sup> DeGennaro and Dwyer.

<sup>4</sup> Villalobos, Luis and Payne, William, “Startup Pre-Money Valuation: The Keystone to Return on Investment”, Ewing Marion Kauffman Foundation, 2007, <<http://www.entrepreneurship.org/startup-pre-money-valuation--the-keystone-to-return-on-investment.html>>.

<sup>5</sup> “Analysis Reports”, Center for Venture Research, University of New Hampshire, <<http://wsbe.unh.edu/analysis-reports-0>>

<sup>6</sup> “About the Band FAQs”, Band of Angels, August 8, 2009, <<http://www.bandangels.com/faqs/index.php>>.

<sup>7</sup> Mason, Colin and Harrison, Richard, “Is it worth it? The rates of return from informal venture capital investments”, Journal of Business Venturing 17, 2002, pp 211-236.

<sup>8</sup> Wiltbank, Robert, “Siding with the Angels: Business angel investing – promising outcomes and effective strategies”, British Business Angels Association and NESTA, May 2009.