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“First-Round Entrepreneurial Investments: Where, When and Why?”

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Abstract

This paper examines the where, when and why of first round entrepreneurial investment activity in the United States from the first quarter of 1995 until the second quarter of 2010. The paper analyzes these venture capital investments taking into consideration the role of macroeconomic variables, region, and industry. Additionally, trends in regional and industrial investments are evaluated using statistical and graphical analyses. By studying these findings, we are able to understand the impact of different periods of economic growth on venture capital investments. Lastly, the shock of the dot.com bubble and recent financial crisis are integrated into the findings.

JEL Classification: C12, D81, D92, E22, G12, G24, G3, M13, M21, O16, O3

Key Words: Venture Capital; First Round of Financing; Innovations; Inventions; Economic Geography; Location; Biotechnology; Business Products and Services; Computers and Peripherals; Consumer Products and Services; Electronics and Instrumentation; Financial Services; Healthcare Services; Industrial and Energy; Information Technology Services; Media and Entertainment; Medical Devices and Equipment; Networking and Equipment; Retailing and Distribution; Semiconductors; Software; Telecommunications.

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Financing Innovation First Round of Financing by Venture Capital

I. Introduction

This paper examines the first round of venture capital investment in the United States (U.S.) from 1995Q1 to 2010Q2, taking into consideration both location and industry sector. The data concentrate only on the first sequence of financing. This point is the time when invention becomes innovation and the firm or entrepreneurs seek the cooperation of venture capitalists. In other words, it is the first time that venture capitalists become involved. Venture capitalists can invest in a firm in different stages of its development, be it Seed/Start-Up, Early Stage, Expansion Stage, or a Later Stage. From the point of view of the venture capitalist, investing in a company for the first time is likely riskier than investing in a company in which it already holds equity.

The research question is whether industry and region are important factors in determining the first round of venture capital investment. Furthermore, this paper examines the effects of a wide array of macroeconomic variables on first stage venture capital financing activity. Consequently, the venture capital data are augmented by Real Gross Domestic Product, Gross Domestic Product (GDP), Implicit Price Deflator, Gross Private Domestic Investment, Personal Savings, Producer Price Index, Consumer Price Index, Effective Federal Funds Rate, Bank Prime Rate, 3-Month Treasury Bill Rate, 6-Month Treasury Bill Rate, 3-Year Treasury Bill Rate. As detailed in the results section, only some of these variables were found to significantly impact first round venture capital investment. In addition, this paper examines long-term trends and the effect of the current economic crisis on first round of venture capital investment.

It is worthwhile to examine the venture capital market, which heavily relies on expectations of future GDP, investment, and innovation. Confidence and uncertainty about the future economic environment are vital factors in committing to financing a new company for the first time. Furthermore, economic geography has recently risen to the frontier of research due to the works of the 2008 Nobel laureate, Paul Krugman, who was awarded the Nobel Prize for his “analysis of trade patterns and location of economic activity.” Although

both international economists and industrial organization researchers study economic geography, it has received limited consideration in the venture capital literature.

The unique data on venture capital investment activity in the United States, spanning from 1995Q1 until 2010Q2 are from The MoneyTree Survey. The survey is a quarterly study of venture capital investment activity in the United States and is considered to be a credible source of information on emerging companies that receive financing from venture capital firms. The database allows for stratifications of the data by seventeen industries and nineteen regions. The statistical analysis confirms that, in addition to the effects of Real Gross Domestic Product, CPI, PPI, S&P500 and three-month interest rate, both region and industry sector are significant factors in explaining first-round investment in the venture capital market of the U.S. economy.

The remainder of the paper is organized as follows. Section II presents a brief review of the literature. Section III describes the data. Section IV derives the empirical results, and Section V concludes.

II. Literature Review

Davis and North (1971) offer an early overview of the importance of finance, both public and private, in generating economic growth. Economists have long held the view that innovative activities are difficult to finance in a freely competitive market place. Support for this view in the form of economic-theoretic modeling begins with the classic articles of Nelson (1959) and Arrow (1962).

The main output of innovation investment is the knowledge of how to make new goods and services. This knowledge is non-rival. Its use by one firm does not preclude its use by another (Hall, 2005). To the extent that knowledge cannot be kept secret, the returns to the investment in it cannot be appropriated by the firm undertaking the investment, and

therefore such firms will be reluctant to invest, leading to the under-provision of Research and Development (R&D) and other innovation investments in the economy.

The topic of innovation finance has drawn a wide variety of research. Khortum and Lerner (1998, 2000) and Lerner (2001) propose an explanation for high innovation in the 1980s and 90s through the expansion of venture capital. They note that patent trading has accelerated and that in traditional industries such as pharmaceuticals, research intensity at the firm level has contracted somewhat. Lamoreaux, Levenstein and Sokoloff (2007) and Klepper (2007) find that start-ups were fundamental to the Second Industrial Revolution (1870–1920) and often received venture capital from small-scale sources personally affiliated with the inventors themselves. Hall (2008) explains underinvestment in innovation through reasoning based on financial markets and concludes in part that venture capital is a limited solution to what he claims is underinvestment.

The reemergence of economic geography theory can be attributed to the pioneering works of Krugman (1991a, 1991b, 1998), Fujita and Krugman (2004), and Venables (1996, 1998, 2003). Krugman (1991a) examines the uneven economic development of regions, emphasizing the importance of economic geography in explaining divergent regional development. Krugman (1991b) develops a simple model in which a country can endogenously become differentiated into an industrialized “core” surrounded by an agricultural “periphery.” Krugman (1998) discusses the emergence of a new area of research, labeled as the 'new economic geography'. It differs from traditional work in economic geography by incorporating a modeling strategy that uses the same rigorous technical and mathematical tools. Furthermore, these models utilize recent developments in

industrial organization that explicitly consider the notion of economies of scale, found in the 'new trade' and 'new growth' theories.

Lamoreaux and Sokoloff (1999a) study the geography of the market for technology in the late-nineteenth- and early-twentieth century in the United States. Lamoreaux and Sokoloff (1999b) describe inventive activity and the market for technology in the United States, during 1840–1920. The same authors study the financing of U.S. innovations spanning from 1870 to the present (Lamoreaux and Sokoloff, 2007).

The study of industrial location is fundamental to understanding the field of economic geography. Behrens (2005) investigates the importance of market size as a determinant for industrial location patterns. Midelfart, Overman, and Venables (2000) estimate a model of industrial locations across countries. The model combines factor endowments and geographical considerations, showing how industry and country characteristics interact to determine the location of production. Furthermore, Alonso-Villar (2005) shows that transport costs have an impact on industrial locations. He studies the location decisions of upstream and downstream industries when transport costs in each sector are analyzed separately. He concludes that the effects of cost reductions in transporting final goods are different from those in intermediate goods.

In addition to geographical location, another important consideration is industry choice. In the context of venture capital literature, the pioneering study, based on one hundred start-up firms, is Murphy (1956). The importance of industry choice in achieving start up success has also been studied by others. In a series of papers, Y. Shachmurove (2001), and A. Shachmurove and Y. Shachmurove (2004) study annual and cumulative returns of publicly traded firms which were backed by venture capital. Y. Shachmurove

(2006) examines venture capital investment activity in the United States for the years 1996 – 2005. Y. Shachmurove (2007) relates issues in international trade to entrepreneurship, innovation, and the growth mechanism of the free-market economies. Perez (2002, 2004) proposes an explanation for the clustered nature of innovation by focusing on the nature of the financing of invention.

III. Data

The data on venture capital investment activity in the United States are from The MoneyTree Survey. The survey is a quarterly study of venture capital investment activity in the United States which measures cash for equity investments by the professional venture capital community in private emerging U.S. companies. The survey is a collaboration among PricewaterhouseCoopers, Thomson Venture Economics and the National Venture Capital Association, and is the only source endorsed by the venture capital industry. Table 1 displays summary statistics for the macroeconomic variables. Figures 1 shows the total amount of quarterly first-round investment. Figure 2 displays the total amount of quarterly first round financing deals. Both figures clearly reach their maximum value around the year 2000. Note that there is a clear trend in both series from 1995 until the late 1990s. At this point, there is a clear disruption in both trend estimations by the dot com bubble. Since 2002, first round investment has exhibited steady growth, until the recent recession in 2008. The slope after 2002 appears very similar to the slope of the trend before the dot com bubble. Additionally, it appears that first stage investment has already reached its lowest point during the financial crisis and is currently making a slow recovery along with the broader economy.

The MoneyTree™ Report records cash for equity investments as the cash is actually received by the company (also called a *tranche*) as opposed to when financing is committed (often referred to as a *"term sheet"*) to a company. Accordingly, the amount reported in a given quarter may be less than the total round amount committed to the company at the time when the round of financing closed. The type of financing as it is used in the MoneyTree™ Report refers to the number of tranches a company has received. The number designation (1, 2, 3, etc.) does not refer to the round of financing. Rounds are usually designated alphabetically, e.g. Series A, Series B, and so on. The MoneyTree™ Report does not track rounds.

The data include the first sequence of financing by a venture capital firm in all stages of development of the firm, either at the stage of Seed/Start-Up, Early Stage, Expansion Stage, or Later Stage. Appendix 3 provides the definitions of the various stages of development. Since the data concentrate only on the first sequence of financing, one identifies this point as the crossroad where invention becomes innovation and the firm or entrepreneurs seek the cooperation of the venture capitalists.

Figure 3 exhibits total first sequence financing by stage of development. It appears that venture capitalists prefer to invest during the Early Stage and Expansion Stage of development. It is probable that venture capitalists are cautious of investing in a start-up firm, which has no credit history, revenue, or track record. Although innovation and ideas are important to the venture capital industry, a firm needs to establish that it has enough financial and managerial competence to grow before a venture capital firm will invest. A firm has to demonstrate it has some degree of survivability in order to attract venture capital financing.

Furthermore, Figure 3 shows that the first sequence of financing occurs much less frequently in the Later Stage of development. After a firm has generated a steady revenue and profit stream, the firm is likely able to obtain financing from other creditors such as banks, and is able to access various credit markets. Venture capital firms generally do not get involved this late in the development of a company. The basis business model of a venture capital firm is to spread many high-risk, high-return investments among many promising young corporations with the hope that a few will become successful, yielding a high return for a minimal investment. Once a company has established itself, it is usually able to attain better credit terms from more traditional creditors such as banks. Figure 3 shows that the share of first sequence investment that goes to firms in each stage of development stays roughly constant overtime. The persistence of this relationship suggests that the association between first stage financing and stage of development is important to the nature and business plan of venture capitalism.

The database stratifies the geographical areas into eighteen locations. They include the following geographical areas: Alaska/Hawaii/Puerto Rico; Colorado; DC/Metroplex; LA/Orange County; Midwest; New England; New York Metro; North Central; Northwest; Philadelphia Metro; Sacramento/Northern California; San Diego; Silicon Valley; South Central; Southeast; Southwest; Texas; and Upstate New York. Appendix 2 provides precise definitions of all these regions. Figure 4 displays first stage venture capital investment stratified by region. All the regions are included except for AK/HI/PR, Sacramento/N. Cali, Unknown, Upstate NY. The excluded regions have missing values and too many values of zero.

Figure 5 plots the ranking of each region relative to other regions as measured by first-stage investment of venture capitalists. The figure clearly shows that different regions changed their ranking relative to their previous positions. The one exception is Silicon Valley, which except for the first year of the sample, 1995, remains the highest recipient of first stage financing throughout the 1995Q1 through 2010Q2 period. Silicon Valley is known as a hotbed for technology firm start-ups. Not surprisingly, Silicon Valley received a very large portion of first sequence financing during the dot com boom. Although there is some degree of cross over, there are some regions, such as Silicon Valley, New York Metro, and New England which tend to consistently obtain higher first round investment than other regions over time. In addition, many regions specialize in particular industries. Hence, when a surge in demand or innovation hits a certain industry, it likely impacts the amount of first stage financing some regions receive. Thus, history is important in determining the destination of future first stage financing.

Figure 6 shows first stage venture capital investment stratified by industry. All the industries are included, except for “Other,” which had too many missing values and values of zero. The industry classifications are: Biotechnology, Business Products and Services, Computers and Peripherals, Consumer Products and Services, Electronics/Instrumentation, Financial Services, Healthcare Services, Industrial/Energy, IT Services, Media and Entertainment, Medical Devices and Equipment, Networking and Equipment, Retailing/Distribution, Semiconductors, Software, Telecommunications, and finally, Other. Appendix 1 contains the exact definitions of all the industries. Figure 7 plots the annual ranking of each industry relative to other industries from 1995 until the end of the sample. There is a good degree of crossover in how much first round investment each industry

receives. However, software appears to be the largest recipient of first stage financing over time. It can be seen that the industry and amount of first stage financing vary over time. Thus, region, industry, and time period all matter in predicting first stage investment.

There are 7,872 quarterly observations of venture capital investment. The data span from the first quarter of 1995 until the second quarter of 2010. In addition to the venture capital data, the following macroeconomic variables are included in the study: Real Gross Domestic Product, Gross Domestic Product: Implicit Price Deflator, Gross Private Domestic Investment, Personal Savings, Producer Price Index, Consumer Price Index, Effective Federal Funds Rate, Bank Prime Rate, 3-Month Treasury Bill Rate, 6-Month Treasury Bill Rate, 3-Year Treasury Rate, 5-Year Treasury Rate, 10-Year Maturity Rate, Industrial Production: Durable Consumer Goods, S&P 500 Index, Change in Private Inventories, and the University of Michigan's Consumer Sentiment index.

The effect of the current recession on first stage venture capital investment has been dramatic. The year 2008 was the first year in which first round investment decreased since 2003, which represents a marked deviation from trend. The financial crisis negatively impacted investment in all regions and all industries. Although there are significant variations across industry and region during the current economic crisis, geography and industry remain important determinants of venture capital investment. A general recovery is observed in most industries and regions. First stage financing is up since the second quarter of 2009 in all four stages of development. Although there is currently not enough data for a statistical analysis since first stage financing hits its low point during the recession in 2009Q1, it appears that the new trend line has a less steep slope than before the financial

crisis. This suggests that the recovery in first stage financing could be slow, and span a long time.

IV. Empirical Results

Table 2 presents the Pearson Correlation Coefficients for the macroeconomic variables and their corresponding significant values for the variables used in the study. Investment and Real GDP deals are highly correlated, with a correlation coefficient of 0.871. Every measure of GDP is strongly negatively associated with all interest rates. The very short run overnight federal funds rate is more correlated with IR3 than IR5 and IR10 (-0.709, -0.761,-0.829 respectively). The correlation between all the interest rates is significant as can be expected. The pair-wise correlations between the interest rates are all above 0.90. The correlation between the S&P500 and Real GDP is 0.638. This is of interest because both the stock market and venture capital rely heavily upon speculation between future economic prospects and returns.

Table 3 presents the regression results for the first round of venture capital investment as a function of the quarter of the transaction, number of deals, real GDP, GDP deflator, private investment, personal savings, PPI, CPI, federal funds rate, bank prime rate, durable goods production, S&P500, change in inventories, consumer sentiment, and the interest rate on treasury bills for maturities of 3 months, 6 month, 3 years, 5 years, and 10 years. In addition, the industry and regional indicators are included. The sixteen dummy variables for the different industries were measured relative to the biotech industry, and the eighteen

dummies for the different regions were measured relative to the Alaska/Hawaii/Puerto Rico region.

The first regression model uses all the available variables. This regression represents the starting point from which the final model was derived. As shown in Table 5, the Adjusted R^2 is equal to 0.5147. As expected, a rise in the number of deals increases the amount of venture capital invested. The coefficients on Software, Telecommunication, Networking and Equipment, Medical Devices and Equipment, Industrial/Energy, Financial Services were statistically significant. Furthermore, in terms of the regional coefficients, LA Orange County, NY Metro, and Texas were significant. As displayed in Table 5, with all other variables held constant, an increase in GDP raises the amount of investment by venture capitalists. Interestingly, all the interest rates were statistically insignificant except for the 3 month and 6 month Treasury bill rates. The 3 month rate has a negative coefficient, while the 6 month rate had a positive coefficient. The high degree of collinearity between the interest rates is likely making their estimation difficult. Additionally, the coefficient on private investment is negative, which is surprising. One could explain this trend by interpreting that total private investment crowds out venture capital investment. In any case, the first model needs to be refined. Insignificant and highly correlated regressors were dropped from the regression, resulting in a reduced model.

Table 4 displays the results of the reduced model. The first round of venture capital investment is represented as a function of the number of deals, real GDP, private investment, PPI, CPI, federal funds rate, S&P500, and the 3 month Treasury bill rate. In addition, the industry and regional indicators are included. Many more coefficients on the regional and industrial dummies are now significant. In terms of the industrial sector indicators, Business

Products and Services, Computers and Peripherals, Consumer Products and Services, Electronics/Instrumentation, IT Services, Media and Entertainment, Medical Devices and Equipment, Other, Retailing/Distribution, and Semiconductors were all significant. All the regional dummies were highly significant with the exception of Unknown and Upstate New York. Observing the p-values, it appears that region is a more significant predictor of first round investment than industry. Furthermore, first stage investment is positively related to Real GDP and the S&P500 index. The coefficient on CPI is negative, while the coefficient on PPI is positive. It is plausible that higher prices decrease profit margins and make new investment seem less attractive. The estimated coefficient on private investment is negative again. This could be interpreted as a crowding out effect on total investment on venture capital investment. The coefficient on the federal funds rate is negative, but insignificant. The estimate on the 3 month Treasury bill rate is positive and significant. Based on the various intermediate fits which were run to obtain this model, it does not appear that first stage investment is sensitive to interest rates.

V. Conclusion

This paper investigates first round venture capital investment in the United States for the period 1995Q1 through 2010Q2, stratified by both locations and industries. The first round is the point where venture capital is invested in a company for the first time. The statistical results confirm the importance of both regions and industries in explaining the investment in

venture capital. Even in light of many macroeconomic variables, industry and region are still dominant factors in determining first-sequence venture capital financing.

Table 1: Summary Statistics of Macroeconomic Variables, 1995Q1-2010Q2

Variable	Mean	Std Dev	Minimum	Maximum
Real GDP	11562.1	1365.58	9025.27	13363.5
GDP Deflator	94.6187	9.58319	80.969	110.488
Private Investment	1747.11	352.299	1126.2	2352.1
Personal Savings	302.744	142.152	110.2	793.5
PPI	148.01	17.0821	127.2	182.5
CPI	184.035	21.3015	150.867	218.909
Federal Fund IR	3.59365	2.11274	0.12	6.52
Prime Rate	6.61302	2.08442	3.25	9.5
IR3M	3.3027	1.96585	0.06	6.02
IR6M	3.40333	1.94469	0.16	6.04
IR3Y	4.11937	1.73122	0.83	7.27
IR5Y	4.45413	1.45542	1.55	7.39
IR10Y	4.91111	1.10128	2.74	7.48
Durable Consumer Goods	87.3661	10.0261	68.7742	101.554
SP500	1092.6	262.008	480.47	1497.18
Change Inventories	51.0855	36.0252	3.1	179.5
Consumer Sentiment	89.7905	13.253	57.7	110.1

Table 2: Pearson Correlation Coefficients

Table 2: Pearson Correlation Coefficients	Real GDP	GDP Deflator	Private Investment	Personal Savings	PPI
Real GDP	1	0.95075	0.87119	0.24515	0.90445
		<.0001	<.0001	0.0548	<.0001
GDP Deflator	0.95075	1	0.73701	0.45729	0.98334
	<.0001		<.0001	0.0002	<.0001
Private Investment	0.87119	0.73701	1	-0.1701	0.68795
	<.0001	<.0001		0.1862	<.0001
Personal Savings	0.24515	0.45729	-0.1701	1	0.49477
	0.0548	0.0002	0.1862		<.0001
PPI	0.90445	0.98334	0.68795	0.49477	1
	<.0001	<.0001	<.0001	<.0001	
CPI	0.96425	0.99699	0.75211	0.43727	0.98006
	<.0001	<.0001	<.0001	0.0004	<.0001
Federal Fund IR	-0.57231	-0.60907	-0.19077	-0.58057	- 0.58007
	<.0001	<.0001	0.1375	<.0001	<.0001
Prime Rate	-0.5682	-0.60165	-0.19023	-0.57043	- 0.57212
	<.0001	<.0001	0.1386	<.0001	<.0001
IR3M	-0.59566	-0.63374	-0.21034	-0.58587	- 0.60858
	<.0001	<.0001	0.1008	<.0001	<.0001
IR6M	-0.58793	-0.62468	-0.1981	-0.5839	-0.5994
	<.0001	<.0001	0.1227	<.0001	<.0001
IR3Y	-0.70931	-0.73752	-0.35173	-0.54841	- 0.70614
	<.0001	<.0001	0.0051	<.0001	<.0001
IR5Y	-0.76055	-0.78397	-0.42835	-0.52534	- 0.74854
	<.0001	<.0001	0.0005	<.0001	<.0001
IR10Y	-0.82882	-0.83146	-0.55005	-0.45217	- 0.78562
	<.0001	<.0001	<.0001	0.0002	<.0001
Durable Consumer Goods	0.66587	0.42138	0.85655	-0.4388	0.31254
	<.0001	0.0006	<.0001	0.0004	0.0126
SP500	0.63843	0.45085	0.78248	-0.24651	0.40338
	<.0001	0.0002	<.0001	0.0534	0.001
Change Inventories	0.13535	0.22983	-0.02177	0.47329	0.20998

	0.2942	0.0723	0.8666	0.0001	0.1014
Consumer Sentiment	-0.62546	-0.78213	-0.30417	-0.59785	- 0.82206
	<.0001	<.0001	0.0162	<.0001	<.0001

	CPI	Federal FundIR	Prime Rate	IR3M	IR6M	IR3Y	IR5Y
GDP Deflator	0.99699	- 0.60907	-0.60165	-0.63374	-0.62468	-0.73752	-0.78397
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Private Investment	0.75211	- 0.19077	-0.19023	-0.21034	-0.1981	-0.35173	-0.42835
	<.0001	0.1375	0.1386	0.1008	0.1227	0.0051	0.0005
Personal Savings	0.43727	- 0.58057	-0.57043	-0.58587	-0.5839	-0.54841	-0.52534
	0.0004	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
PPI	0.98006	- 0.58007	-0.57212	-0.60858	-0.5994	-0.70614	-0.74854
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
CPI	1	- 0.64098	-0.63442	-0.66604	-0.65852	-0.76551	-0.80725
		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Federal Fund IR	- 0.64098	1	0.99939	0.99391	0.99112	0.94155	0.90524
	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001
Prime Rate	- 0.63442	0.99939	1	0.99243	0.99009	0.93883	0.90196
	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001
IR3M	- 0.66604	0.99391	0.99243	1	0.99847	0.9618	0.92794
	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001
IR6M	- 0.65852	0.99112	0.99009	0.99847	1	0.96704	0.9325
	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001
IR3Y	- 0.76551	0.94155	0.93883	0.9618	0.96704	1	0.99201
	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001
IR5Y	- 0.80725	0.90524	0.90196	0.92794	0.9325	0.99201	1
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	
IR10Y	- 0.85067	0.82735	0.82377	0.85225	0.85577	0.95073	0.98117
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

Durable Consumer Goods	0.44168	- 0.15024	-0.15662	-0.16185	-0.15769	-0.25443	-0.29593
	0.0003	0.2399	0.2203	0.2051	0.2171	0.0442	0.0185
SP500	0.47179	0.06455	0.06595	0.03094	0.03346	-0.08873	-0.15363
	<.0001	0.6153	0.6076	0.8097	0.7946	0.4892	0.2293
Change Inventories	0.20307	- 0.19201	-0.18422	-0.16763	-0.15259	-0.13784	-0.15766
	0.1134	0.1349	0.1518	0.1928	0.2364	0.2854	0.221
Consumer Sentiment	- 0.78351	0.67645	0.66636	0.70366	0.69887	0.75414	0.76198
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

	IR10Y	Durable Consumer Goods	SP500	Change Inventories	Consumer Sentiment
Real GDP	-0.82882	0.66587	0.63843	0.13535	-0.62546
	<.0001	<.0001	<.0001	0.2942	<.0001
GDP Deflator	-0.83146	0.42138	0.45085	0.22983	-0.78213
	<.0001	0.0006	0.0002	0.0723	<.0001
Private Investment	-0.55005	0.85655	0.78248	-0.02177	-0.30417
	<.0001	<.0001	<.0001	0.8666	0.0162
Personal Savings	-0.45217	-0.4388	-0.24651	0.47329	-0.59785
	0.0002	0.0004	0.0534	0.0001	<.0001
PPI	-0.78562	0.31254	0.40338	0.20998	-0.82206
	<.0001	0.0126	0.001	0.1014	<.0001
CPI	-0.85067	0.44168	0.47179	0.20307	-0.78351
	<.0001	0.0003	<.0001	0.1134	<.0001
Federal Fund IR	0.82735	-0.15024	0.06455	-0.19201	0.67645
	<.0001	0.2399	0.6153	0.1349	<.0001
Prime Rate	0.82377	-0.15662	0.06595	-0.18422	0.66636
	<.0001	0.2203	0.6076	0.1518	<.0001
IR3M	0.85225	-0.16185	0.03094	-0.16763	0.70366
	<.0001	0.2051	0.8097	0.1928	<.0001
IR6M	0.85577	-0.15769	0.03346	-0.15259	0.69887
	<.0001	0.2171	0.7946	0.2364	<.0001
IR3Y	0.95073	-0.25443	-0.08873	-0.13784	0.75414
	<.0001	0.0442	0.4892	0.2854	<.0001
IR5Y	0.98117	-0.29593	-0.15363	-0.15766	0.76198
	<.0001	0.0185	0.2293	0.221	<.0001
IR10Y	1	-0.38562	-0.27948	-0.17609	0.73608

		0.0018	0.0265	0.171	<.0001
Durable Consumer Goods	-0.38562	1	0.76883	-0.24207	0.02963
	0.0018		<.0001	0.058	0.8177
SP500	-0.27948	0.76883	1	-0.04578	0.06715
	0.0265	<.0001		0.7239	0.6011
Change Inventories	-0.17609	-0.24207	-0.04578	1	-0.15968
	0.171	0.058	0.7239		0.2151
Consumer Sentiment	0.73608	0.02963	0.06715	-0.15968	1
	<.0001	0.8177	0.6011	0.2151	

Table 3: Regression Results (Full Model)

Dependent Variable: Investment
Number of Observations Read: 7872
Number of Observations Used: 7456
Number of Observations with Missing Values: 416

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr>F
Model	53	3.50E+18	6.60E+16	150.17	<.0001
Error	7402	3.25E+18	4.39E+14		
Corrected Total	7455	6.75E+18			
Root MSE	20958444	R-Square	0.5181		
Dependent Mean	15060360	Adj R-Sq	0.5147		
Coeff Var	139.163				

Variable	Label	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept		-1.8E+08	93137068	-1.93	0.0539
Date		-654315	612198	-1.07	0.2852
Deals		5753693	82250	69.95	<.0001
industry2	Business Products and Services	485758	1298599	0.37	0.7084
industry3	Computers and Peripherals	-235572	1567065	-0.15	0.8805
industry4	Consumer Products and	-1537734	1328339	-1.16	0.247

	Services				
industry5	Electronics/Instrumentation	-1577111	1585420	-0.99	0.3199
industry6	Financial Services	3717954	1386321	2.68	0.0073
industry7	Healthcare Services	500314	1473881	0.34	0.7343
industry8	IT Services	-534143	1254704	-0.43	0.6703
industry9	Industrial/Energy	3123223	1183812	2.64	0.0084
industry10	Media and Entertainment	-1122725	1194676	-0.94	0.3474
industry11	Medical Devices and Equipment	-2570050	1216078	-2.11	0.0346
industry12	Networking and Equipment	6227662	1421708	4.38	<.0001
industry13	Other	-2320775	2872365	-0.81	0.4191
industry14	Retailing/Distribution	-722676	1515817	-0.48	0.6335
industry15	Semiconductors	-78283	1429015	-0.05	0.9563
industry16	Software	-7738811	1149375	-6.73	<.0001
industry17	Telecommunications	4087630	1213290	3.37	0.0008
region2	Colorado	3803073	3193131	1.19	0.2337
region3	DC Metroplex	2381036	3118777	0.76	0.4452
region4	LA Orange County	6306672	3106277	2.03	0.0424
region5	Midwest	3492796	3096117	1.13	0.2593
region6	NY Metro	6692436	3097378	2.16	0.0308
region7	New England	2159423	3086462	0.7	0.4842
region8	North Central	2733909	3186790	0.86	0.391
region9	Northwest	3809487	3136108	1.21	0.2245
region10	Philadelphia Metro	2734699	3159339	0.87	0.3867
region11	Sacramento/ N. Cali	3528804	3892599	0.91	0.3647
region12	San Diego	3531605	3184791	1.11	0.2675
region13	Silicon Valley	753486	3097643	0.24	0.8078
region14	South Central	4015795	3473637	1.16	0.2477
region15	Southwest	3098723	3210909	0.97	0.3345
region16	Southeast	4242227	3095777	1.37	0.1706
region17	Texas	5336807	3118202	1.71	0.087
region18	Unknown	224772	4121025	0.05	0.9565
region19	Upstate NY	1485302	3512374	0.42	0.6724
Real GDP		35035	6513.287	5.38	<.0001
GDP Deflator		-800356	729980	-1.1	0.2729
Private Investment		-54702	8089.057	-6.76	<.0001
Personal Savings		3930.993	4543.165	0.87	0.3869
PPI		868080	295766	2.94	0.0033
CPI		-1132673	567152	-2	0.0458
Federal Fund IR		-4562364	5307053	-0.86	0.39
Prime Rate		1634208	5491357	0.3	0.766

IR3M		-1.3E+07	4738913	-2.73	0.0063
IR6M		22921935	6873743	3.33	0.0009
IR3Y		-9727031	7725396	-1.26	0.208
IR5Y		8252948	10438702	0.79	0.4292
IR10Y		-2366016	5868269	-0.4	0.6868
DurableConsumerGoods		294653	183551	1.61	0.1085
SP500		-4681.58	5652.01	-0.83	0.4075
Change Inventories		-3352.84	10418	-0.32	0.7476
Consumer Sentiment		60128	87929	0.68	0.4941

Table 4: Regression Results (Revised Model)

Dependent Variable: Investment
Number of Observations Read: 7872
Number of Observations Used: 7454
Number of Observations with Missing Values: 418

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr>F
Model	42	6283.406	149.6049	80.38	<.0001
Error	7411	13794	1.86127		
Corrected Total	7453	20077			
Root MSE	1.36428	R-Square	0.313		
Dependent Mean	15.456	Adj R-Sq	0.3091		
Coeff Var	8.82688				

Variable	Label	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept		11.24677	0.55341	20.32	<.0001
Deals		0.16374	0.00531	30.83	<.0001
Industry2	Business Products and Services	-0.30199	0.08449	-3.57	0.0004
Industry3	Computers and Peripherals	-0.6326	0.10211	-6.19	<.0001
Industry4	Consumer Products and Services	-0.45641	0.08642	-5.28	<.0001

Industry5	Electronics/Instrumentation	-0.78895	0.10312	-7.65	<.0001
Industry6	Financial Services	-0.07989	0.0902	-0.89	0.3758
Industry7	Healthcare Services	-0.14644	0.0959	-1.53	0.1268
Industry8	IT Services	-0.1442	0.08166	-1.77	0.0775
Industry9	Industrial/Energy	-0.06757	0.07703	-0.88	0.3805
Industry10	Media and Entertainment	-0.20648	0.07777	-2.65	0.008
Industry11	Medical Devices and Equipment	-0.32701	0.07915	-4.13	<.0001
Industry12	Networking and Equipment	-0.0875	0.0925	-0.95	0.3442
Industry13	Other	-1.23497	0.18681	-6.61	<.0001
Industry14	Retailing/Distribution	-0.51233	0.09861	-5.2	<.0001
Industry15	Semiconductors	-0.39192	0.09297	-4.22	<.0001
Industry16	Software	0.02298	0.07476	0.31	0.7586
Industry17	Telecommunications	-0.12913	0.07895	-1.64	0.1019
region2	Colorado	0.90829	0.20767	4.37	<.0001
region3	DC Metroplex	0.92022	0.20279	4.54	<.0001
region4	LA Orange County	1.41781	0.20195	7.02	<.0001
region5	Midwest	1.13998	0.20129	5.66	<.0001
region6	NY Metro	1.53543	0.20141	7.62	<.0001
region7	New England	1.34393	0.20064	6.7	<.0001
region8	North Central	0.68726	0.20716	3.32	0.0009
region9	Northwest	1.1489	0.20388	5.64	<.0001
region10	Philadelphia Metro	0.57972	0.20534	2.82	0.0048
region11	Sacramento/ N. Cali	0.76089	0.25315	3.01	0.0027
region12	San Diego	1.1162	0.20705	5.39	<.0001
region13	Silicon Valley	1.57479	0.20137	7.82	<.0001
region14	South Central	0.46814	0.22588	2.07	0.0383
region15	Southwest	0.82928	0.20873	3.97	<.0001
region16	Southeast	1.34291	0.20128	6.67	<.0001
region17	Texas	1.34743	0.20276	6.65	<.0001
region18	Unknown	-0.36838	0.26802	-1.37	0.1693
region19	Upstate NY	0.185	0.22836	0.81	0.4179
Real GDP		0.00146	0.00024961	5.85	<.0001
Private Investment		-0.00153	0.0002642	-5.8	<.0001
PPI		0.05309	0.01224	4.34	<.0001
CPI		-0.10928	0.02019	-5.41	<.0001
Federal Fund IR		-0.08796	0.07752	-1.13	0.2565
IR3M		0.19708	0.08116	2.43	0.0152
SP500		0.00041597	0.00017839	2.33	0.0197

Figure 1: Total First Round of Venture Capital Investment in the United States 1995Q1 – 2010Q2

Figure 2: Total Number of First Round Venture Capital Investment Deals in the United States 1995Q1 – 2009Q1

Figure 3: Total First Round Venture Capital Investment by Stage of Development. 1995Q1-2010Q2

Figure 4: Total First Round Investment in Venture Capital by Regions 1995Q1 – 2010Q2

Figure 5: Regional Ranks in Venture Capital Investment: 1995-2010

Figure 6: Total First Round Investment in Venture Capital by Industry 1995Q1 – 2010Q2

Figure 7: Industrial Ranks in Venture Capital Investment: 1995-2010

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Appendix 1: Industry Definitions

The Industry Classifications used in the MoneyTree™ Report are as follows:

Biotechnology

Developers of technology promoting drug development, disease treatment, and a deeper understanding of living organisms. Includes human, animal, and industrial biotechnology products and services. Also included are biosensors, biotechnology equipment, and pharmaceuticals.

Business Products and Services

Offers a product or service targeted at another business such as advertising, consulting, and engineering services. Also includes distributors, importers, and wholesalers.

Computers and Peripherals

Includes manufacturers and distributors of PCs, mainframes, servers, PDAs, printers, storage devices, monitors, and memory cards. Also included are digital imaging and graphics services and equipment such as scanning hardware, graphics video cards and plotters. Integrated turnkey systems and solutions are also included in this category.

Consumer Products and Services

Offers products or services targeted at consumers such as restaurants, dry cleaners, automotive service centers, clothing, toiletries, and house wares.

Electronics/Instrumentation

Includes electronic parts that are components of larger products and specialized instrumentation, including scientific instruments, lasers, power supplies, electronic testing products and display panels. Also included are business and consumer electronic devices such as photocopiers, calculators, and alarm systems.

Financial Services

Providers of financial services to other businesses or individuals including banking, real estate, brokerage services, and financial planning.

Healthcare Services

Includes both in-patient and out-patient facilities as well as health insurers. Included are hospitals, clinics, nursing facilities, managed care organizations, Physician Practice Management Companies, child care and emergency care.

Industrial/Energy

Producers and suppliers of energy, chemicals, and materials, industrial automation companies and oil and gas exploration companies. Also included are environmental, agricultural, transportation, manufacturing, construction and utility-related products and services.

IT Services

Providers of computer and internet-related services to businesses and consumers including computer repair, software consulting, computer training, machine leasing/rental, disaster recovery, web design, data input and processing, internet security, e-commerce services, web hosting and systems engineering.

Media and Entertainment

Creators of products or providers of services designed to inform or entertain consumers including movies, music, consumer electronics such as TVs/stereos/games, sports facilities and events, recreational products or services. Online providers of consumer content are also included in this category (medical, news, education, legal).

Medical Devices and Equipment

Manufactures and/or sells medical instruments and devices including medical diagnostic equipment (X-ray, CAT scan, MRI), medical therapeutic devices (drug delivery, surgical instruments, pacemakers, artificial organs), and other health related products such as medical monitoring equipment, handicap aids, reading glasses and contact lenses.

Networking and Equipment

Providers of data communication and fiber optics products and services. Includes WANs, LANs, switches, hubs, routers, couplers, and network management products, components and systems.

Retailing/Distribution

Firms making consumer goods and services available for consumer purchase including discount stores, super centers, drug stores, clothing and accessories retailers, computer stores and book stores. Also included in this group are e-Commerce companies ---those selling their products or services via the Internet.

Semiconductors

Design, develop or manufacture semiconductor chips/microprocessors ore related equipment including diodes and transistors. Also includes companies that test or package integrated circuits.

Software

Producers of bundled and/or unbundled software applications for business or consumer use including software created for systems, graphics, communications and networking, security, inventory, home use, educational, or recreational. Also included is software developed for specific industries such as banking, manufacturing, transportation, or healthcare.

Telecommunications

Companies focused on the transmission of voice and data including long distance providers, local exchange carriers, and wireless communications services and components. Also included are satellite and microwave communications services and equipment.

Other

If the classification criterion in all of the other categories does not appropriately describe the product or service offered, the firm may be categorized in this group.

Appendix 2: Geographical Definitions

The Geographical Classifications used in the MoneyTree™ Report are as follows:

Alaska/Hawaii/Puerto Rico

Alaska, Hawaii, and Puerto Rico

Colorado

The state of Colorado

DC/Metroplex

Washington, D.C., Virginia, West Virginia, and Maryland

LA/Orange County

Southern California (excluding San Diego), the Central Coast and San Joaquin Valley

Midwest

Illinois, Missouri, Indiana, Kentucky, Ohio, Michigan, and western Pennsylvania

New England

Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and parts of Connecticut (excluding Fairfield county)

New York Metro

Metropolitan NY area, northern New Jersey, and Fairfield County, Connecticut

North Central

Minnesota, Iowa, Wisconsin, North Dakota, South Dakota, and Nebraska

Northwest

Washington, Oregon, Idaho, Montana, and Wyoming

Philadelphia Metro

Eastern Pennsylvania, southern New Jersey, and Delaware

Sacramento/Northern California

Northeastern California

San Diego

San Diego area

Silicon Valley

Northern California, bay area and coastline

South Central

Kansas, Oklahoma, Arkansas, and Louisiana

Southeast

Alabama, Florida, Georgia, Mississippi, Tennessee, South Carolina, and North Carolina

Southwest

Utah, Arizona, New Mexico, and Nevada

Texas

The state of Texas

Upstate New York

Northern New York State, except Metropolitan New York City area

Appendix 3: Stage of Development Definitions

The Stage of Development Classifications used in the MoneyTree™ Report are as follows:

- **Seed/Start-Up Stage**
The initial stage. The company has a concept or product under development, but is probably not fully operational. Usually in existence less than 18 months.
- **Early Stage**
The company has a product or service in testing or pilot production. In some cases, the product may be commercially available. May or may not be generating revenues. Usually in business less than three years.
- **Expansion Stage**
Product or service is in production and commercially available. The company demonstrates significant revenue growth, but may or may not be showing a profit. Usually in business more than three years.
- **Later Stage**
Product or service is widely available. Company is generating on-going revenue; probably positive cash flow. More likely to be, but not necessarily profitable. May include spin-offs of operating divisions of existing private companies and established private companies.

Appendix 4: Macroeconomic Variables

Real Gross Domestic Product: Seasonally Adjusted, Annualized Rate, Billions of Chained 2005 Dollars

Gross Domestic Product: Implicit Price Deflator (Index 2005=100),

Gross Private Domestic Investment, Seasonally Adjusted, Annualized Rate, Billions of Dollars

Personal Savings, Seasonally Adjusted, Annualized Rate, Billions of Dollars

Producer Price Index: Finished Goods (Index 1982=100)

Consumer Price Index for All Urban Consumers: All Items (Index 1982-84=100)

Effective Federal Funds Rate

Bank Prime Rate

3-Month Treasury Bill: Secondary Market

Rate6-Month Treasury Bill: Secondary Market

Rate3-Year Treasury: Constant Maturity Rate

5-Year Treasury Constant Maturity Rate

10-Year Treasury Constant Maturity Rate

Industrial Production: Durable Consumer Goods (Index 2007=100)

S&P 500 Index

Change in Private Inventories, Billions of Dollars

University of Michigan: Consumer Sentiment (Index 1st Quarter 1966=100)