

# BUZZ: The Impact of Positive User Sentiment on Startup Company Valuations in the USA

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Honors Thesis

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## Abstract:

In this paper, I exploit organic user buzz to reveal that investors view positive user data as a proxy for future user acquisition and company growth. After conducting venture capital investment analysis, I show that companies that experience higher degrees of market excitement receive higher levels of interest from investors. The more user buzz a startup receives, the more likely it is that it will, first, participate in an additional funding round, and, second, receive a higher valuation in the next funding cycle. My analysis also finds that venture capitalists are not yet adept at predicting market excitement for a particular product at earlier funding stages. Instead, they are more likely to apply a “spray and pray” early-stage investing approach.

Keywords: startup, consumer technology, venture capital, financial valuation, user acquisition, stages of funding, Crunchbase

Acknowledgments: Many thanks to my advisor, Tim, for believing that I would only ever need two weeks to complete this thesis. Much love for my family and friends who have provided emotional and intellectual support along this journey.

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**Introduction:**

In April 2012, Facebook announced that it would pay \$1 billion to acquire Instagram, a photo sharing mobile application. At the time, Instagram was a company less than two years old with no revenue and about 100 millions users. A year later, Mark Zuckerberg, Facebook CEO, then made a \$3 billion offer for Snapchat, another photo sharing mobile application. Similar to Instagram, Snapchat was making no revenues at the time, which led the media to question what the Facebook CEO and other investors were betting on. Snapchat's founders, Evan Spiegel and Bobby Murphy, turned down Facebook's offer claiming that their mobile application was worth more than the \$3 billion valuation.

"This is an important milestone for Facebook because it's the first time we've ever acquired a product and company with so many users," Zuckerberg reported after the Instagram acquisition (Price 2012). Facebook's interest in the number of users Instagram possessed and the future value they could contribute to Facebook implies that acquisitions of consumer technology startups by larger companies are fuelled by what the acquirer can do with the company in the future, not some multiple of revenues or profits today. Investors are betting that applications such as Instagram and Snapchat will create user buzz such that even more users, particularly young people, will become future adopters.

Some reasons for the increasingly enthusiastic valuations of consumer-facing startups include; stickiness of users, users creating network effects that attract other users, and network effects that continue to grow the more users are attracted to a particular application or website. High valuations for Instagram and Snapchat, as well as other similar consumer-facing startups, indicate heightened investor excitement for companies that see exponential user growth even though they have not posted profits. It is worth questioning the relationship between user buzz and startup valuations by investors. In particular, do users play a role in generating interest in a startup in the eyes of investors? Can the number of users that two comparable startup companies boast of as well as their user growth projections become the key differentiator for one startup's investor valuation relative to that of another?

Organic user buzz is relevant to investors considering investing in consumer-facing technology startups because our ability as consumers to learn about new products and services has never been better. Our download or purchase time is merely seconds, meaning startups can now achieve extremely rapid user growth in a short period. User acquisition has become a top priority for startups chasing higher projections of growth and financial valuations in order to show increasing trends in their user data, (Crichton 2014). The role of user buzz for a startup company is capable of elevating investors' beliefs of its growth trajectory and this effect can be observed through the valuation that it raises in the capital markets. The valuations for

Instagram and Snapchat reflect confidence in the potential growth of these companies that is derived from their exponential user growth.

For investors, the combination of rapid adoption cycles and better information flow greatly increase the opportunity for learning about and then investing in a startup company. Top venture firms such as Sequoia, Andreessen Horowitz, and Google Ventures employ entire teams to analyze data like mobile and web application rankings and social network sentiment to determine the next breakout success (Crichton 2014). By leveraging easily accessible user data in assessing later-stage investments, investors can make financing decisions after monitoring user growth, rankings, and sentiment. This data-driven approach during later-stage investments can be contrasted with the prediction of user adoption and growth prior to the existence of user data. Are venture capital investors able to accurately predict user excitement for a new consumer technology startup at the seed stage or are they simply lucky that some of their investments pay off?

In this paper, I study two periods of time- that of pre-buzz and post-buzz investing decisions. First, I study how buzz in the market amongst users of comparable startup companies affect their growth projections as shown by the increases in their valuation. Study results indicate that for a startup company at time,  $t$ , the effect of user sentiment and user rankings is positive on the next amount of funding raised through venture capital after such time  $t$ . Using the number of mentions per startup company name from a survey of

1000 college students as proxy for user sentiment and buzz, I show that the more mentions, or positive buzz, a startup company receives relative to that of a comparable company in its field, the more funding it will be able to raise in subsequent rounds. This occurs when investors become more confident of a startup's potential relative to that of other comparable companies.

In the second part of my empirical strategy, I test the hypothesis that data-driven VCs are able to predict consumer's adoption of products accurately. For later stage investments, I show that after June 2011 and June 2012, VC firms were making investments in startups that had received buzz and were distinguishing between later-stage investments with the most buzz, rather than the least buzz. However, while later stage investments are shown to be getting smarter, early stage investors are not necessarily able to predict winners without user data. Namely, the top VC firms are shown to have not had a lot of success in terms of picking investments that were the most popular in consumer's eyes.

**Literature review:**

This study differs from analysis conducted by venture capitalists such as Aileen Lee and Ann Miura Ko on billion dollar successes from the past decade such as Facebook, LinkedIn, and Workday. While this paper shares similar background data sources such as Crunchbase and LinkedIn with a lot of other TechCrunch articles detailing the rise of companies that have raised billion dollar valuations, I complement publicly available data with “organic buzz” collected from student surveys. The student surveys conducted in June 2011 and June 2012 allow for the measurement of user sentiment and degree of referral amongst users, an interesting data point that allows for the element of timing in my work. Unlike other historical funding studies, I can now separate my sample into pre-and-post-buzz stages and compare the amounts raised by startups that have received varying buzz magnitude. This source of exogenous variation helps to explain how investors differentiate between many similar startups. It also creates an interesting test of VC effectiveness in terms of recognizing success at an early stage.

This paper is unique, as it will study startup financial valuation that is driven by the positive effect of user growth and sentiment. Other studies by Nitin and Moren (2009) have covered a model for the funding process whereby the startup valuation is positively impacted by improved product quality. Also in 2009, Hering and Olbrich propose several financial models to help venture capitalists estimate a company’s valuation based on a particular

startup's intellectual capital. Under the assumption that comparable companies would possess similar intellectual and financial capital prior to venture financing, it is important for us to find out why some startups end up with a higher valuation than others and buzz in the market amongst users might be one variable that help explain divergent funding trends.

This paper builds on previous research conducted by Aggarwal, Gopal, Alok Gupta, and Singh (2012) around the relationship of word-of-mouth with venture capital financing. They shed some light on the effectiveness of user sentiment and user rankings that my study also observes. Their paper addresses the belief among entrepreneurs that electronic word-of-mouth (eWOM), specifically blog coverage, can aid in achieving venture capital financing. In general, they find that the eWOM of popular bloggers helps ventures in getting higher funding amounts and valuations. Their results support my findings because they suggest that startup companies can take advantage of word-of-mouth to gain new users that lead to higher valuations at the later stages of financing.

A paper published by Martens and Jennings (2007) detailing the role of user narratives in securing financial capital upholds my research by highlighting the role that stories play in helping to generate interest and commitment from investors and potential resource providers. They find that, like buzz in this survey, stories help potential resource providers identify an entrepreneurial firm's tangible capital and comprehend intangible capital



such as excitement and stickiness. Combined with research by Cohen and Dean (2005) who suggest that effective user narratives reduces perceived uncertainty and risk of investors, these arguments support my discovery that positive user buzz is helpful in mobilizing financial resource providers to commit capital to one comparable startup company over another.

Finally, this paper addresses the debate regarding the effectiveness of the diversification strategy that many VCs refer to as “spray and pray”. Dave McClure from 500 Startups is of the opinion that he should make a lot of investments with the assumption that most things fail, and then go in for a second round and spend more time on those that succeed. Alternatively, other investors such as Jed Katz from Javelin Ventures do not want a high failure rate in portfolio companies. Instead, Jed will invest in four or five companies at the seed level with the full intention of entering series A and later deals with them as well. In this paper, I test for VC strategy effectiveness when picking early-stage investments by comparing how their investments fare in period of time after the seed round funding is raised. It appears that the top VC firms might not have the expected advantage and are more prone to chancing upon investments that are popular with users by virtue of the sheer size of their portfolios.

**Data:**

For the purposes of this study, two data sets were matched to find comparable startup company pairs. The first was compiled from a private company, Crunchbase, which operates a database of 48,367 startup companies. All information is accurate until November 30, 2014. Second, was a survey referred to as the buzz questionnaire that features responses collected in June 2011 and June 2012, covering 1000 college students. This buzz questionnaire was a survey of college students across North America conducted by Stanford University student group, Alpha Kappa Psi, to research trends in the venture capital industry.

**Buzz questionnaire**

1. What is your email address?
2. Where do you go to school?
3. List 3 innovative applications you use regularly?
4. List 3 innovative websites you use regularly?
5. What application/website would you recommend to a friend?

Figure 1: Buzz questionnaire answered by 1000 respondents in June 2011 and June 2012. Question of focus was #5 because it offered the value of user referral and could be used as a proxy for positive user sentiment and ranking relative to other comparable companies

I focused on question #5 for this thesis: “what application/website would you recommend to a friend?” The question of focus implied users were excited enough about an application/website to refer it to other potential users. Answers to this question were considered to be the user buzz that led to investor excitement for companies such as Snapchat and Instagram. I obtained count measures of the 187 company names that were given in

response to the question of “what application/website would you recommend to a friend?” These companies were then ranked in the order of magnitude of “buzz” they received, which is implied by the count of mentions they received from the survey respondents. Buzz ranged from 1 to 42 mentions and signals the level of user interest. Other details such as date of founding, investors, funding, location, market, and region of operation were then accorded to these 187 “buzzed companies” if they were found in the list of 48,367 startup companies from Crunchbase.

<b>Mentions</b>	<b>Percent</b>
0	49.33%
1	25.33%
2	6.67%
3	4.53%
4	2.13%
5	1.87%
6	2.13%
7	1.07%
8	1.87%
9	0.8%
10	0.8%
12	0.27%
13	0.8%
14	0.53%
18	0.27%
26	0.53%
31	0.27%
36	0.27%
42	0.53%

Table 1 shows the distribution of mentions collected from the survey results. A mention of 0 indicates that the company belongs to the control group and a mention of 1 or more indicates that the company belongs to the treatment group.

When comparing the 187 buzzed companies to the greater Crunchbase dataset, I found that the companies referred to by survey respondents were often newer, had raised more funding on average, and had been asked to participate in more funding rounds. This indicates that market buzz was somewhat successful in signifying user excitement for young companies. I found that buzzed companies were, on average, seven times more successful in raising total valuations and were also twice as likely to have raised another funding round compared to the average startup in the Crunchbase dataset of 48,367 startup companies. This implies that user referral and market buzz could be a valuable data point for investors when projecting growth. The summary statistics are shown below:

<b>Variable Name</b>	<b>Variable Description</b>	<b>Buzzed Companies Average</b>	<b>Crunchbase Average</b>
Daysinoperatbuzz	Difference in days between founding date and survey date as of June 2011 or June 2012	1825	9380
Funding_total_usd	Funding (\$US M) raised as of Nov 30 2014	115	14.8
Funding_rounds	Number of funding rounds since founding date as of Nov 30 2014	3.26	1.69

Table 2 presents summary statistics of buzzed companies relative to that of the larger Crunchbase dataset.

Buzzed companies were then matched to comparable startups in the Crunchbase database, resulting in 187 matched pairs. The buzz questionnaire's 187 companies formed the treatment group for this study, whilst their corresponding matched companies formed the control group. It was important to find comparable companies for the 187 buzzed startups because I wanted to control for other factors that could lead to different amounts in funding rounds such as market of operation, political regulation, ease of setting up a business, as well as length of time in market.

The match mechanism worked according to the following parameters;

- Matched if companies were operating within USA
- Matched if operating in same industry (complete list of industries to be found in appendix)
- Matched if days of operation fell between a range of 1000 days above or below treatment company

Results from the matching process indicate that treatment group startup companies that were referred to by survey respondents performed better in terms of funding raised given approximately the same amount of time in operation. For two comparable companies operating in the same industry vertical, users were better at identifying companies that had received almost double the funding than companies in my matched "control group" had received. Furthermore, a company in the treatment group was more likely to have undergone one additional round of funding on average. This finding

supports the hypothesis that that investors are looking out for companies who receive market buzz and are likely to fund them more highly.

<b>Variable Name</b>	<b>Variable Description</b>	<b>Buzzed Companies Average</b>	<b>Control Group Average</b>
Daysinoperatbuzz	Difference in days between founding date and survey date as of June 2011 or June 2012	1825	2003
funding_total_usd	Funding (\$US M) raised as of Nov 30 2014	115	69
Funding_rounds	Number of funding rounds since founding date as of Nov 30 2014	3.26	2.57

Table 3 presents summary statistics of buzzed companies relative to that of the matched companies that form the control group for this experiment.

Given the target audience of the buzz questionnaire, the dataset limits survey enquiry to the consumer technology space. The buzz questionnaire was targeted at college students so majority of the companies mentioned as buzz-worthy will be consumer-facing technology startups that college students are most familiar with. Arguably, these are the firms that user referral and positive sentiment are the most relevant concerns for when investors are trying to predict future growth. The major markets that the buzzed and matched companies operated in are:

<b>Market</b>	<b>Percent</b>
Curated Web	13%
Mobile	10%
Social Media	9%
Software	9%
Music	8%
E-Commerce	5%
News	4%
Photography	4%
Games	4%
Travel	4%
Advertising	4%
Productivity Software	3%
File Sharing	3%
Finance	3%
Health Care	3%
Messaging	3%
Entertainment	2%
iPhone	2%
Education	2%
Shopping	2%
Chat	2%

Table 4 shows the markets of operation from survey results.

### **Research Design:**

The first part of my research design aims to study the relationship between user data and VC valuation at later stages. Table 3 displays the average characteristics of the 187 company pairs that were a result of the matching process. The 187 comparable pairs form a sample group of comparable startups that had received early investor attention up to Series B level before the buzz survey results were analyzed in June 2011 and June 2012. Due to the fact that matches were made to satisfy conditions such as similar financial standing, days in operation, and industry vertical, they could then be said to be at the same starting point at time of pre-buzz. Comparing a matched pair's funding ex-ante market buzz with their ex-post funding raised would allow me to quantify the jump in investor valuation based on buzz or degree of buzz received. As shown in Table 5, not all companies in either the buzzed or control group were successful in raising another round of funding which allows me to better understand if buzz played a role in the success rate of raising another funding round.

<b>Received funding round after buzz</b>	<b>Buzzed group</b>	<b>Control group</b>
Yes	65%	27%
No	35%	73%

Table 5 shows percentage of each group that successfully raised a funding round post-buzz. Number of buzzed companies=187, number of control group companies=187. "Yes" and "No" data is binary response based on whether a company successfully raised a funding round post-buzz and does not take into account amount raised in those rounds.



The results from the buzz questionnaire act as a “treatment” on which I can test for the effects of buzz for potential financial growth. The responses, referred to as buzz, were organic in nature as students were not paid to recommend companies that they thought were interesting enough to refer to their friends. Furthermore, the companies in my sample were unaware that the survey was being organized and thus would not have been able to craft marketing campaigns aiming to raise brand awareness at the time of buzz collection. Buzz functions as a proxy for organic user acquisition and market excitement; I am hypothesizing that the receipt of buzz by a company will add towards an investor’s interest in funding their growth.

The assumptions in my research design are that all other outcome-determining characteristics except for the probability of receiving a buzz mention vary minutely near the cutoff period of June 2011 or 2012, and that outcomes change after the cutoff only because of the measured change in user referral and sentiment. After the matching process, I also assume that two comparable startups have equal probability of raising later funding rounds if they experience the same level of buzz, high or low. Hence, when one company receives more buzz relative to its match in the control group, I can study the change in its financial trajectory.

In the second part of my research, I test for VC strategy effectiveness when picking early-stage investments during the pre-buzz time period by comparing how their investments fare in terms of the survey results. As shown in Table 3, in the ex-ante market buzz time period, all the companies to be tested for effects of buzz had received 2-3 rounds on average of VC funding. Given the observation that not all buzzed companies received funding in subsequent rounds after time of buzz, early investors would realize gains if they had backed a startup that recorded high buzz magnitude because there would be increased interest from other investors to join in on funding the growth of a particular company.

Using Entrepreneur 2014 rankings of "Top 100 early stage VCs", I select the VC firms with fund sizes greater than \$200 million and assigned the top 41 firms that fit the criteria a value of 1 in a dummy variable called "VCranking". I assumed that VC firms with fund sizes greater than \$200 million would be capable of investing in many startups at the same time. As such, top VCs could be less selective and more widespread in their seed investments. Another reason for doing so was the assumption that VC firms with fund sizes greater than \$200 million had gotten a top ranking due to previous successful seed investments that had generated large returns. I was interested in learning whether VC firms with both larger funds and a successful investing track record would be in an advantageous position when betting on untested early stage companies.

I then matched the VCranking variable to the 187 startup pairs based on their leading early-stage investor. This allowed for the comparison of investment performance between top VCs with larger fund sizes relative to other VC firms. The comparison of investment performance will illuminate if “spray and pray” investments or more selective deals are most capable of predicting future user buzz and adding resources to the most-buzzed consumer technology startups from the pre-series A or series-A level.

**Results:**

Part 1A: As buzz increases, the expectation of future growth increases as shown by an increase in next funding round raised

To test the hypothesis that companies who received a buzz mention or multiple buzz mentions will increase an investor's interest in funding their growth at later stages, I measure their ability to raise higher subsequent funding rounds after June 2011 or 2012. First, I considered an equation characterizing the causal relationship between whether a startup company receives buzz (dummy variable that equals to 1 if there is at least 1 mention and 0 otherwise),  $B_i$ , and most recent funding round total outcome in millions (m) of dollars,  $Y_i$ :

$$Y_i = A_0 + \pi B_i + \varepsilon_i \quad (1)$$

In this model, investors face two decisions. First, whether or not they should participate in a new funding round that a company is trying to raise. Second, under the assumption that they do invest, they also have to decide on the value of 1 additional buzz mention. One question they would ask: is there a marginal effect arising from 1 additional buzz mention on the potential value of a startup company? Or, is equation (1) sufficient because there is no statistically significant difference between 1 mention and 2 mentions?

Investors have to discern whether the magnitude of market buzz for a company matters when estimating future user adoption and company revenue growth. For example, do large volumes of buzz measure large potential growth? Conversely, small volumes of buzz are not sufficient to create the level of growth that investors would want to fund. Equation (2) below addresses the impact of buzz magnitude on startup company valuations by investors in the next round, with  $M_i$  representing a count measure of a startup company's buzz mentions and most recent funding round total outcome in millions (m) of dollars,  $Y_i$ :

$$Y_i = A_0 + \pi M_i + \varepsilon_i \quad (2)$$

$$(1) \quad (2)$$

	Lastfundingtotal	Lastfundingtotal
Mentioned	-10.421 (0.67)	
Mentions		3.587 (2.28) *
_cons	33.840 (3.04) **	21.366 (2.55) *
R2	0.00	0.01
N	375	375

\* p<0.05; \*\* p<0.01

Results from equation (2) indicate that the impact of magnitude of buzz mentions from users,  $M_i$ , about a startup company on recent funding round total raised is statistically different at the 95% level. For each additional mention counted per company name, the funding round total raised increases by \$3.587 million. One additional buzz mention contributes to a marginal increase of  $(\$21.366\text{m} + \$3.587\text{m})/(\$21.366\text{m}) = 16.7\%$  in a startup's next funding round. This shows that investors do consider magnitude of market buzz for a startup when making funding decisions because they are betting that high user enthusiasm will translate into the network effects akin to the likes of Snapchat and Facebook that continue to raise the social and financial value of a particular application or website

On the other hand, the results from equation (1) indicate that merely being mentioned, when  $B_i=1$ , does not produce a positive effect on recent funding round total raised. Instead, when  $B_i=1$ , the amount raised decreases by \$10.421m to \$23.42m from \$33.84m. However, this effect is not shown to be statistically different from zero. These results show that the degree of user's enthusiasm for a startup company is a key indicator that is factored into an investor's valuations when evaluating a startup's potential growth. This can be explained by the intuition that given comparable companies that are trying to gain market share, investors are more likely to be eager to support the startup that has the most excited user base and might practice more caution when a lot of startups have the same level of buzz.

### Part 1B: Robustness checks

In order to check for robustness of this empirical study, I ran a few other regressions. Namely, I needed to ensure that the days in operation of a startup had no effect on user referral and sentiment. I also needed to validate that investors did indeed look at user growth and sentiment as a data point when making investments. In other words, because buzz was shown to have a positive effect on next round valuations, it was necessary to show that buzz was positively correlated to the total amount of funding raised by the 187 paired startup companies in this dataset. The positive relationship between buzz and total funding would help support my initial finding in Part 1A that investors observe user buzz in the market prior to making decisions on later investment rounds.

	(3)	(4)	(5)	(6)
	Daysinoperatbuzz	funding_total_usd	funding_total_usd	funding_total_usd
Mentioned	56.741 (0.33)			45.232 (1.56)
Mentions		12.544 (4.35)**	12.297 (4.26)**	
Daysinoperatbuzz			0.012 (1.37)	0.014 (1.58)
_cons	1,769.232 (14.44)**	67.315 (4.38)**	46.633 (2.17)*	44.705 (1.73)
R2	0.00	0.05	0.05	0.01
N	375	375	375	375

\* p<0.05; \*\* p<0.01

Equation (3) shows that there is not a statistically significant relationship between being buzzed,  $B_i$ , and days in operation. This shows that users would mention companies in the survey responses based on interest level and user satisfaction levels, and that the period of time that they might have been exposed to a startup company does not affect the buzz they accorded to startup companies. Equation (4) tests for the relationship between magnitudes of buzz mentions,  $M_i$ , and total funding. It is shown that startup companies experienced an  $(\$67.32m + \$12.54m)/(\$67.32m) = 18.6\%$  increase in total funding per mention. Thus, startups that had higher buzz not only raised more funding in later rounds from investors, they were also more likely to raise a higher total valuation because higher expectations of product-market fit success and growth were imposed upon them.

Equations (5) and (6) include days of operation as a control to ensure that the results in (1) and (2) did not suffer from omitted variable bias. As can be observed, the results of the regressions follow the same trend. The impact of magnitude of buzz mentions,  $M_i$ , received by a startup company from its users on recent funding round total is statistically significant at the 95% level whereas the effect of merely receiving 1 mention  $B_i$ , is not. This supports my earlier finding that investors take into account one startup's buzz magnitude relative to that of a comparable company in the same market. Adding in days of operation as a control ensures that investors' evaluation of future growth are not influenced by whether a startup had first



mover advantage. The positive relationship between funding total and magnitude of buzz found in equation (5) is then further refined by taking the log function of (5) in equation (7) and the results are still shown to be statistically significant at the 95% level.

	(5)	(6)	(7)
	funding_total_usd	funding_total_usd	logfunding_total
Mentions	12.297 (4.26) **		
Daysinoperatbuzz	0.012 (1.37)	0.014 (1.58)	
Mentioned		45.232 (1.56)	
logmentions			0.884 (5.61) **
logdaysoperationatbuzz			0.541 (2.91) **
_cons	46.633 (2.17) *	44.705 (1.73)	-1.758 (1.30)
R2	0.05	0.01	0.20
N	375	375	179

\* p<0.05; \*\* p<0.01

Part 2: Top VC versus small VC at seed stages when predicting future success with users

In the second part of my empirical strategy, I will test the hypothesis that top VC firms are better able to predict customer's adoption of products accurately at the early stages of a startup's lifecycle. Regressions (8) and (9) are performed to investigate the relationship between a top VC firm and buzz measures  $B_i$  and  $M_i$ :

	(8)	(9)
	Mentioned	Mentions
VCranking	0.527 (5.16) **	1.775 (1.71)
_cons	0.473 (18.29) **	1.892 (7.19) **
R2	0.07	0.01
N	375	375

\* p<0.05; \*\* p<0.01

Equation (8) shows that a company being a recipient of a mention (dummy variable that equals to 1 if there is at least 1 mention and 0 otherwise),  $B_i$ , is positively correlated with backing from a top VC firm. In fact, a top VC firm was 50% more likely to have funded a company that recorded user buzz. This shows that top VC firms are achieving success in terms of backing noteworthy startups that received user buzz in this survey. It appears that casting a wide net when investing in early stage startups might be a good strategy if one is aiming to invest in companies that are able to garner some consumer excitement.

However, equation (9) results indicate that top VC firms who can afford to be less selective in their investments are unable to forecast consumer excitement with more accuracy; they were not shown to have a positive and significant relationship with the startup companies that had higher magnitudes of mentions. VC firm rankings are not correlated with them making the smartest investments. It appears that while top VC firms are able to distinguish between startups that had some or no buzz there is an even playing field between VCs with large or smaller fund sizes when it comes to picking startups that are going to have the highest user adoption in the future. This finding implies that the top VC firms might simply be luckier at getting returns from investment due to “spray and pray” techniques but are still missing out on selecting to lead seed investments in the startups that are reported by users to be the most exciting at time of buzz survey, t.

(10)

(11)

	Lastfundingtotal	Lastfundingtotal
Mentioned	<b>-9.836</b> <b>(0.61)</b>	
VCranking	<b>-4.629</b> <b>(0.14)</b>	<b>-16.307</b> <b>(0.51)</b>
Mentions		<b>3.659</b> <b>(2.31)*</b>
_cons	<b>33.840</b> <b>(3.03)**</b>	<b>22.267</b> <b>(2.59)**</b>
R2	<b>0.00</b>	<b>0.01</b>
N	<b>375</b>	<b>375</b>

\* p&lt;0.05; \*\* p&lt;0.01

Finally, in equations (10) and (11), I include VCranking as a control variable when I regress  $Y_i$  on  $B_i$  and  $M_i$ . Here, I intend to show that being funded in initial stages by a top VC firm does not detract from the relationship discovered in (1) and (2) whereby companies who received multiple buzz mentions would be able to raise higher rounds after June 2011 or 2012. As can be seen, the coefficients have not changed by much, which indicates that early backing from a top VC firm is not viewed as an indicator of future success by other investors when making funding decisions post-buzz.

### **Discussion and Analysis:**

I find evidence that startup companies seeking later stage fundraising can increase their valuations after receiving user referrals. The more mentions a startup received in the buzz survey, the higher the next round of funding raised. This works through the mechanism whereby VC firms will observe market popularity and derive a level of interest accordingly because buzz represents potential user growth. There is shown to be a marginal increase in valuation from an additional mention, because a higher level of VC interest will translate into higher valuations in the next round of funding. Positive user sentiment differentiates two comparable startups from each other in an investor's eyes. VC firms will believe that large volumes of buzz signal large potential growth and are eager to add resources to these young firms.

In addition, I show that the duration of time in market does not affect the likelihood that a startup name gets more mentions. It is striking to note that first-to-market does not necessarily translate into financial success for startup companies. Nor does first-to-market indicate that investors are likely to believe that incumbents possess large potential growth. Instead, it appears that popularity with users, rather than time in market, is what leads to the belief that a startup's product will achieve continued success.

In the second part of my research when I study implicit VC choices in early stage funding before user data becomes available, a highlight includes the finding that top VC firms are not successful in predicting future user popularity relative to other VC firms. Instead, their success at funding notable startups that received the nominal level of 1 buzz mention can be attributed to the large funds that they have available to invest in many startups at the seed level. The wave of “spray and pray” early-stage investing strategies by top VC firms can arguably be said to have given many companies a chance to gain user exposure. Clearly, a different and more deliberate approach is needed if any VC firm is going to be successful in investing early in highly valued and commercially successful companies.

Given my source of organic buzz, my empirical strategy permits me only to study these effects for consumer-facing technology startups. In addition, it is probably wise to apply these findings to startups with products that experience network effects as these are the instances in which users are more likely to refer other users and recommend said company’s product to friends. For these consumer-facing startup companies that experience network effects, the findings from this study indicate that user buzz is an indicator of future success. These results may not be as relevant to enterprise technology companies that would not necessarily appeal to a college demographic.

**Conclusion:**

My findings have important implications for consumer technology entrepreneurs and suggest that startups can raise higher valuations at later stages of venture financing. This paper suggests that entrepreneurs would benefit from rolling out aggressive user acquisition plans after obtaining seed funding, as investors will place a high value on the number of users that have positive experiences with their product. Results show that the returns on investment from marketing and aggressive user acquisition are high in terms of investor interest and later stage funding. Two comparable companies can differentiate their perceived growth trajectories by reporting higher user growth metrics or positive user sentiment studies.

The study highlights other potential research questions that researchers should strive to answer; whether user referral and growth presents perceived or tangible financial value, how startups can increase user referral and growth, as well as how investors can get smarter about their use of data to make investment decisions. It would also be interesting to apply these findings and test for their validity amidst startup companies that operate in other verticals that do not necessarily benefit from network effects and “sticky users”. In those markets, other factors such as those suggested by Shane and Cable (2002) such as top management team characteristics, certifications, intellectual property, and affiliations might play larger roles in venture considerations.

**Appendix:**

Buzz questionnaire answered by 1000 respondents in June 2011 and June 2012. Question of focus was #5 because it offered the value of user referral and could be used as a proxy for positive user sentiment and ranking relative to other comparable companies

**Figure 1: Buzz questionnaire**

1. What is your email address?
2. Where do you go to school?
3. List 3 innovative applications you use regularly?
4. List 3 innovative websites you use regularly?
5. What application/website would you recommend to a friend?



**Figure 2: Operating markets of 187 pairs**

Markets of operation	
App Marketing	Hotels
Auctions	iOS
Automotive	iPhone
Business-2-Business	Location Based Services
Broadcasting	Messaging
Business Services	Mobile
Cloud Computing	Music
Cloud Data Services	News
Collaboration	Opinions
Communities	P2P Money Transfer
Concerts	Payments
Consumer Electronics	Peer-to-Peer
Consumer Goods	Photography
Coupons	Presentations
Customer Relationship Management	Productivity Software
Crowdsourcing	Publishing
Curated Web	Real Time
Customer Service	Retail
Design	Semantic Search
E-Commerce	Services
Education	Shopping
Enterprise Software	Social + Mobile + Local
Entertainment	Social Games
Fashion	Social Media
File Sharing	Social Network Media
Finance	Software
Finance Technology	Storage
Games	Technology
Health Care	Transportation
Hospitality	Travel
	Video on Demand

**Figure 3: Breakdown of buzz respondents**

<b>School Name</b>	<b>Percentage</b>
Stanford	57.3%
Uc Berkeley	14.4%
Massachusetts Institute Of Technology	1.9%
Uc Los Angeles	1.3%
Uc San Diego	1.2%
University Of Florida	1.2%
New York University	1.1%
University Of Southern California	1.0%
Mount Holyoke College	0.8%
Princeton University	0.8%
University Of Maryland College Park	0.8%
Yale University	0.8%
Baruch College	0.7%
Columbia University	0.7%
Cornell University	0.7%
Uc Davis	0.7%
Uc Irvine	0.7%
University Of Maryland	0.6%
University Of Miami	0.6%
University Of Pennsylvania	0.6%
Cal State Long Beach	0.5%
Duke University	0.5%
Harvard	0.5%
Pomona College	0.5%
Uc Santa Barbara	0.5%
Uc Santa Cruz	0.5%
Berklee College Of Music	0.4%
Carnegie Mellon University	0.4%
Florida International University	0.4%
Uc Riverside	0.4%
Others	7.6%

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