

ZEW SEEK Workshop on Social Network Formation and Peer Effects

The Experts in the Crowd: The Role of Reputable Investors in a Crowdfunding Market

28 June 2013

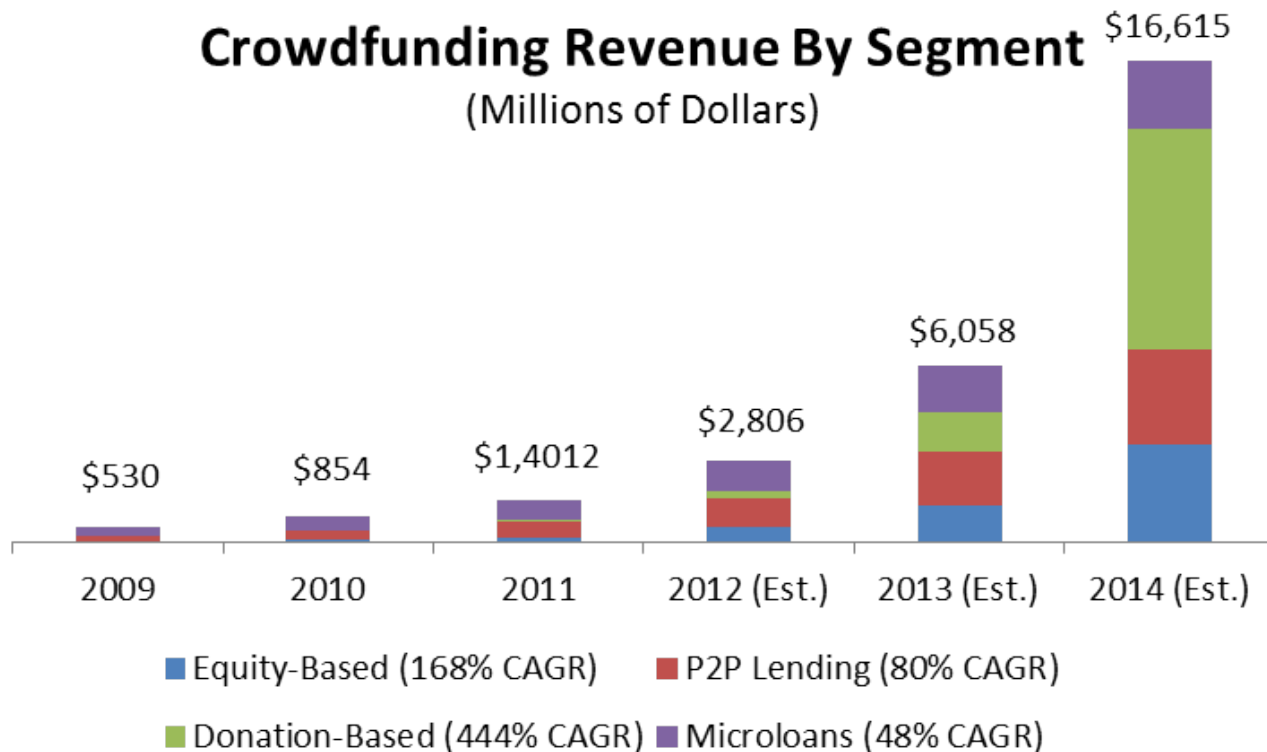
Keongtae Kim

Robert H. Smith School of Business
University of Maryland





Crowdfunding Revenue By Segment (Millions of Dollars)



Source: twistime.com



536



Interest over time ?

The number 100 represents the peak search interest

News headlines Forecast ?



Regional interest ?



0 100

Region | City

Regional interest ?



Netherlands	100	
Spain	69	
Portugal	64	
Germany	60	
Austria	59	
Switzerland	48	
Belgium	36	
Italy	36	
Brazil	34	
United States	33	



Why might Crowdfunding be Different?

▣ Different from traditional investing (e.g., venture capital, angel investing)

- Investors are less sophisticated so may have different preferences
- Higher information asymmetry and lack of publicly available data in the traditional sense
- Geographical separation prevents a stringent review process

=> Investment risk is likely to be higher



Why might Crowdfunding be Different?

Increased visibility of certain types of information

- Sequential investment
- Observe previous investors and investments

Story Time For Kids
by Teknowledge Software

Application Details
Category: Books
Stage: Live in Store
Launch: Live App

Markets
Apple
Free with In-App Purchase

Funding Progress
Campaign is Active
\$1,003 Purchased | 7 Backrs | 35 Days Left
Funding Progress: \$2,250 (Target)
\$0 Reserve

Profit
27% Return
A minimum purchase of \$10 can earn \$13 in revenue.
On Twitter? Your Klout score may get you a higher profit! Click here.

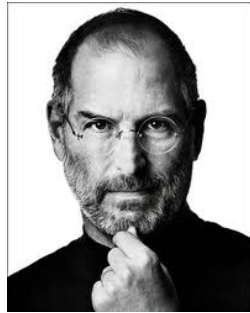
Back this App

7 Campaign Backrs (View All)

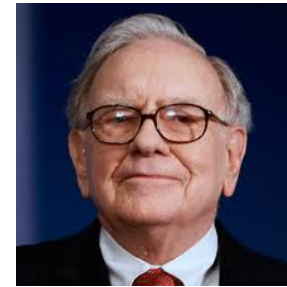
\$11	\$20	\$15	\$855	\$23



▣ Do early investors influence later investors?



Product expert



Market expert

▣ How do these two types of investors influence later investors?

▣ Are their signals credible?



▣ **Opinion leader** (Iyengar et al. 2011)

- **Very few studies of opinion leaders in financial markets**
- **Partly due to lack of detailed individual-level data**

▣ **Economics of signaling** (Spence 1973)

- **Signals useful in reducing information asymmetry**
- **Different types of signals in the same market**

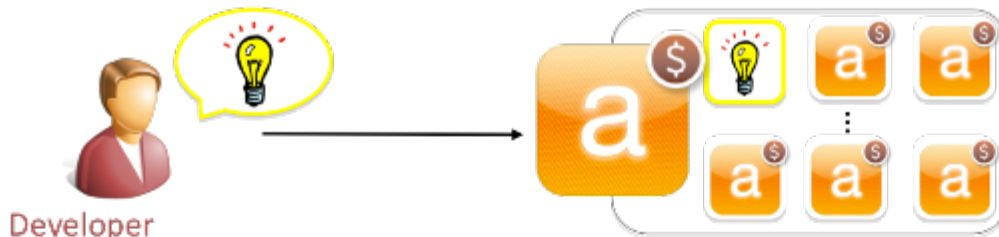
▣ **Herding behavior** (Hirshleifer and Hong Teoh 2003)

- **Information externalities (i.e., observational learning)**

▣ **Crowdfunding** (Agarwal et al. 2011)



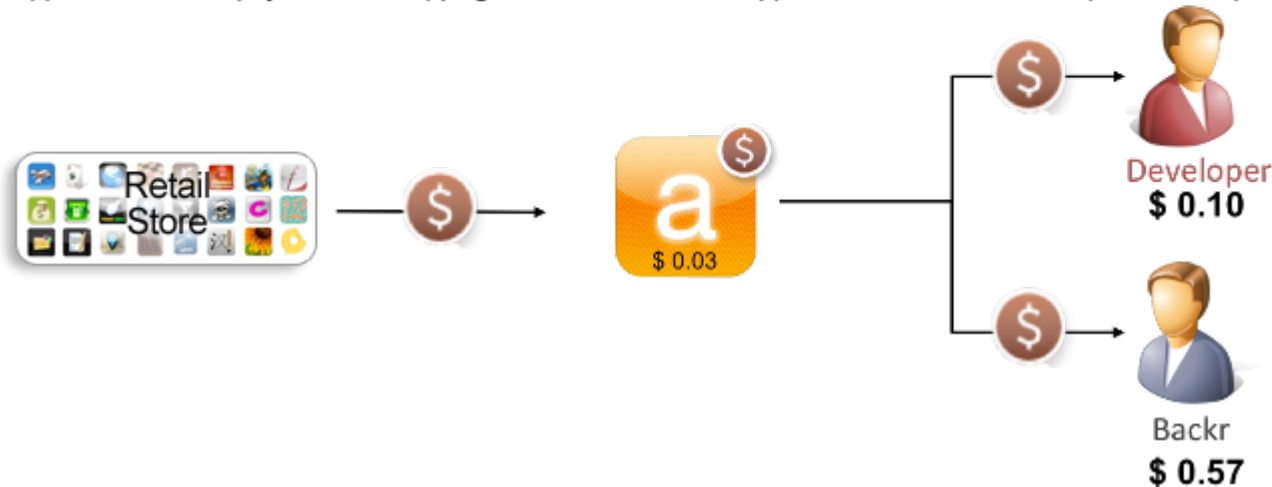
1 Developer sells an app on the appbackr marketplace



2 Backr purchases *bulk of apps* on appbackr for profit and developer receives immediate payment



3 appbackr receives payment after apps get sold on the mobile app store and distributes the profits to all parties





- ▣ **Collect data from October 2010 through June 2013**
- ▣ **Attract 397 app developers listing 551 mobile apps and over 1,117 registered members investing around \$1,000,000 in total**

- ▣ **Concept vs. live apps**
 - **42% are concept apps**
 - **Concept apps tend to attract more money and investors**

- ▣ **Two types of reputable investors**
 - **App developer investors**
 - **Experienced investors (with over \$2,000 investment and over 5 specific investments)**



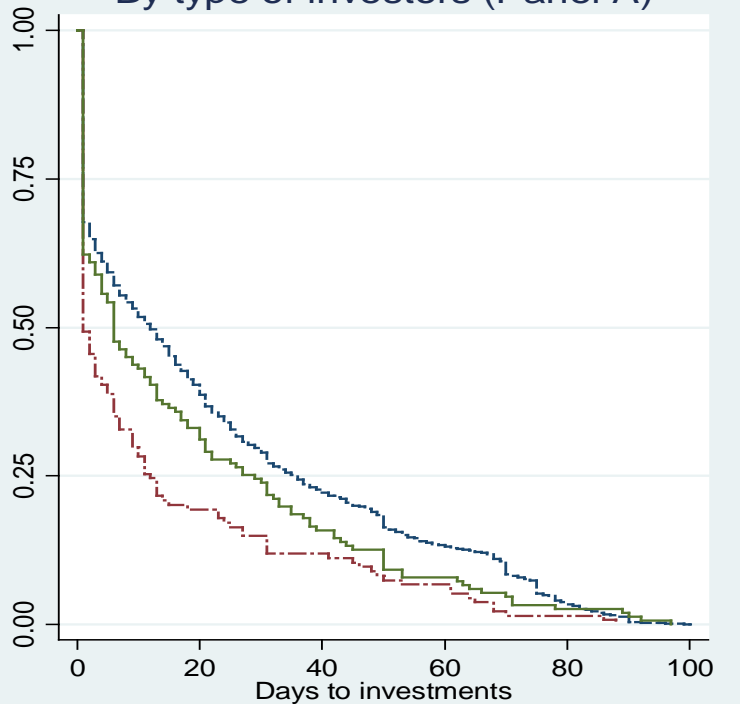
Summary Statistics (Investments)



Variable	App developers		Experienced investors		Crowd	
	Mean	No. obs	Mean	No. obs	Mean	No. obs
Investment intensity						
Cumulative amount	330.13	67	14,641.82	17	209.07	1,035
Cumulative number of investments	2.52	67	22.24	17	1.82	1,035
Investment concentration						
Investment concentration	0.83	28	0.44	17	0.84	319
Investment timing						
Days to investment	19.02	169	21.28	213	24.38	3,156
Days to investment (Concept)	17.42	114	21.55	146	24.77	2,061
Days to investment (Live)	22.34	55	20.69	67	23.87	1,079

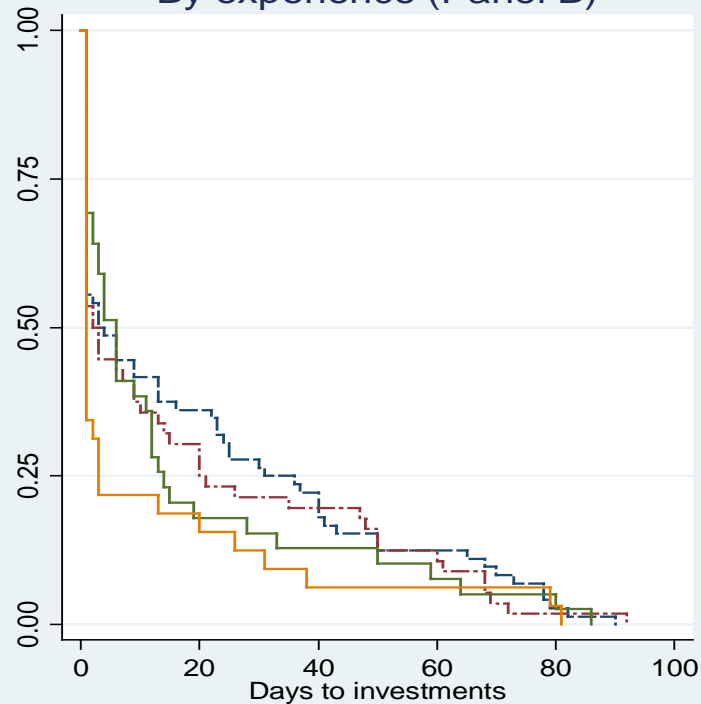


By type of investors (Panel A)



- - - The Crowd - · - · - Experienced Invest
 — App Developer Investors

By experience (Panel B)

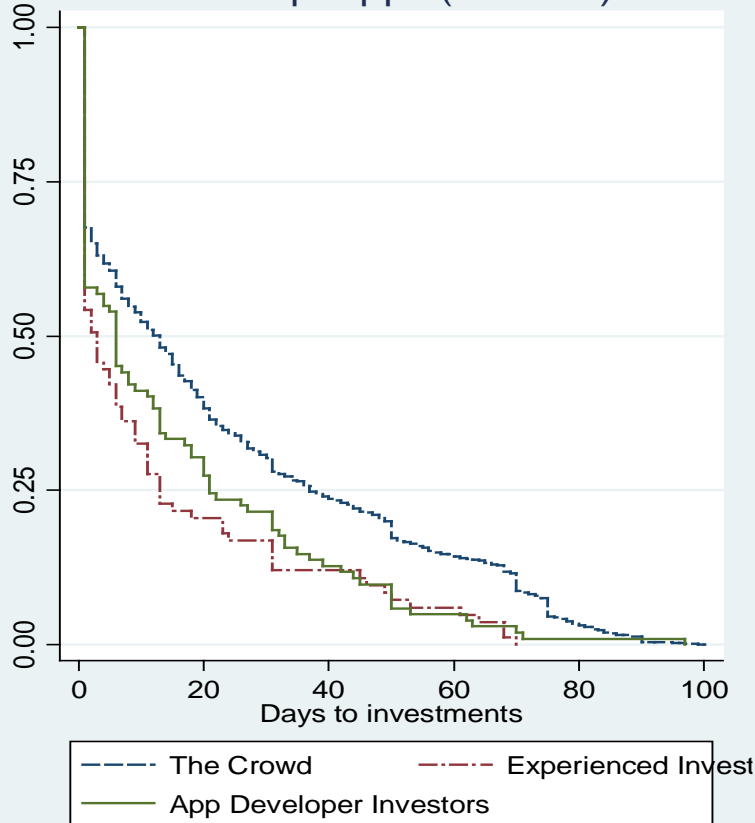


- - - # of inv=5 - · - · - # of inv=6
 — # of inv=7 — # of inv=8

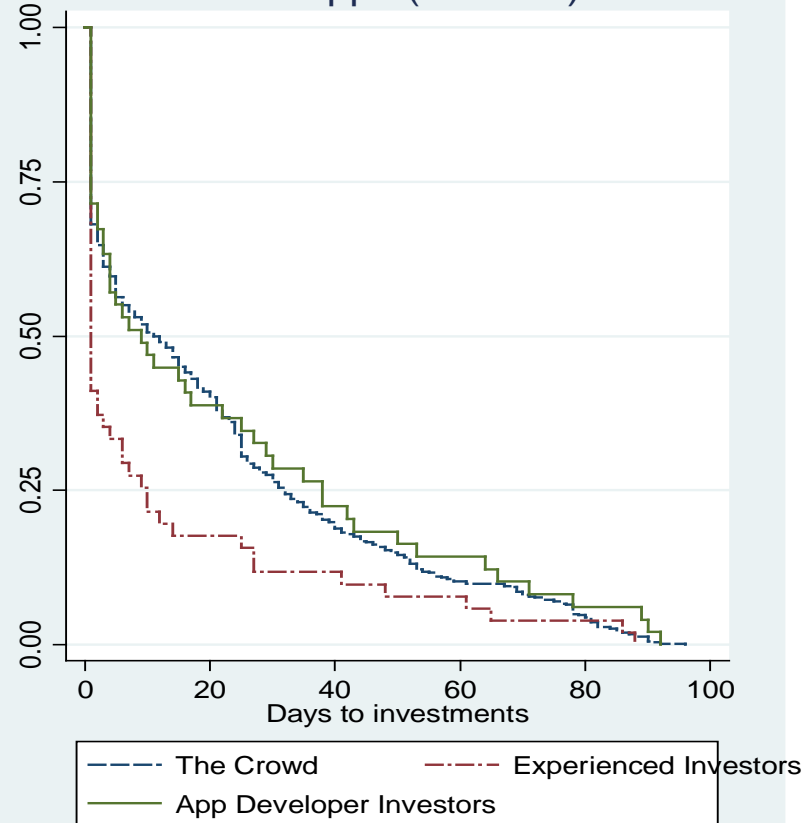


Survival Estimates

Concept apps (Panel A)



Live apps (Panel B)





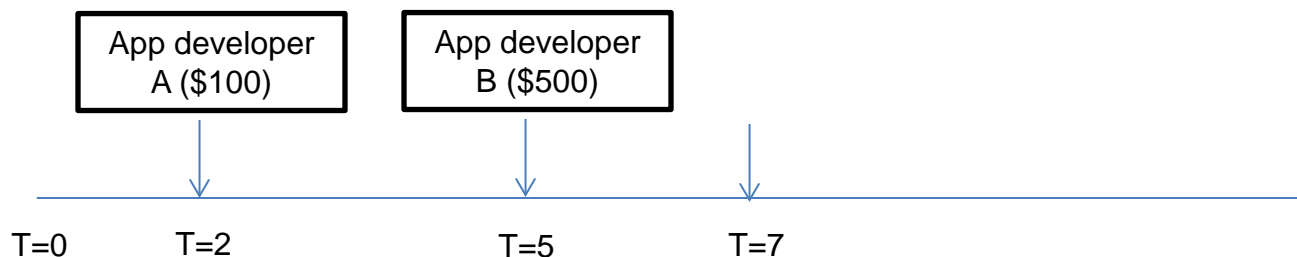
Reputable investors and herding: Panel data estimates with project-fixed effects

$$y_{jt} = \beta_1 A_{jt-1} + \beta_2 E_{jt-1} + \gamma_1 X_{jt-1} + u_j + v_{jt}$$

- DV: log of the daily amount of funding in project j at day t

Independent variables

- A (E): the overall influence measured as the sum of total prior investments of existing app developer investors (experienced investors)
- X: two measures of peer effects (i.e., cumulative amount and cumulative number of investments) and Percentage needed





▣ Endogenous issue

- We are mainly interested in the effect of the reputation of reputable investors rather than in peer effects
- Unobserved heterogeneity across projects: project-fixed effects, short period
- Unobserved correlations of preferences among investors facing the same project (i.e., homophily): project-fixed effects, less public information about individuals and little room for communication
- Correlated unobservables (e.g., marketing efforts): time dummies, no targeted marketing, any location-specific shocks are little likely to be important because of rare likelihood of collocation of investors
- Simultaneity: “expert” status



Reputable Investors and Herding

	All Investors		Crowd		Crowd (Up to Oct. 2012)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Concept	Live	Concept	Live	Concept	Live
Ln(Overall influence of app developers)	0.200***	0.114***	0.172***	0.040	0.169***	0.035
	(0.062)	(0.037)	(0.059)	(0.045)	(0.062)	(0.050)
Ln(Overall influence of experienced investors)	0.079	0.087***	0.042	0.046	0.054	0.076**
	(0.046)	(0.033)	(0.042)	(0.031)	(0.047)	(0.036)
App FE	Yes	Yes	Yes	Yes	Yes	Yes
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
N	5116	5576	5116	5576	4692	4763



Source of Reputation Effect

DV: Crowd (Up to Oct. 2012)	(1)	(2)	(3)	(4)	(5)	(6)
	All	Concept	Live	All	Concept	Live
Ln(Influence of App Developer Investors with successfully funded apps)	0.157**	0.153**	0.131			
	(0.065)	(0.068)	(0.100)			
Ln(Influence of App Developer Investors with successfully funded apps in the same category)				0.195*	0.167	0.127
				(0.103)	(0.120)	(0.116)
Ln(Influence of App Developer Investors with successfully funded apps in the different categories)				0.109	0.114	-0.025
				(0.071)	(0.071)	(0.102)
Ln(Influence of App Developer Investors without successfully funded apps)	-0.056	-0.047	-0.016	-0.101*	-0.100	-0.028
	(0.039)	(0.058)	(0.044)	(0.052)	(0.068)	(0.051)
App FE	Yes	Yes	Yes	Yes	Yes	Yes
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
N	9478	4692	4763	9478	4692	4763



Source of Reputation Effect

DV: Crowd (Up to Oct. 2012)	(1)	(2)	(3)	(4)
	Concept	Live	Concept	Live
Ln(Influence of App Developer Investors with listed apps when investing)	0.149**	0.099		
	(0.064)	(0.069)		
Ln(Influence of App Developer Investors without listed apps when investing)	-0.061	-0.076*		
	(0.068)	(0.043)		
Ln(Influence of Experienced Investors in successfully funded apps)			0.115*	0.099***
			(0.066)	(0.033)
Ln(Influence of Experienced Investors in non-successfully funded apps)			0.124	0.024
			(0.117)	(0.070)
App FE	Yes	Yes	Yes	Yes
Week FE	Yes	Yes	Yes	Yes
N	4692	4763	4692	4763



▣ Ex-post performance: **OLS regression**

- If herding is rational, well-funded apps should have more sales
- Use app sales data from Xyo.net
- Include app rating as a proxy for true quality of an app



Herding and Ex-post Performance

DV: cum num of app downloads	OLS	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)
Ln(amount of funding)	0.177***	0.163***	0.149***	0.133***	0.120***
	(0.045)	(0.045)	(0.046)	(0.040)	(0.040)
App age		0.009***	0.009***	0.011***	0.010***
		(0.002)	(0.002)	(0.002)	(0.002)
Global_rank			-0.000***		-0.000***
			(0.000)		(0.000)
App rating				0.012***	0.011***
				(0.004)	(0.004)
Control variables	No	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.0894	0.4652	0.4874	0.4508	0.4894
N	383	373	320	317	317



▣ Alternative measures of influence

- Use different numbers to define experienced investors
- Use the number of prior investments

▣ Alternative specification for the second analysis

- Use fixed-effects Poisson regression

▣ Potential fraud among app developer investors

- No sign of fraud

▣ Rho-differencing to remove serial correlation



▣ Key findings

- Two types of “reputable investors”
- Differential role of these “experts”
- Alignment of expertise with investments
- Investors are rather sophisticated – able to discriminate between different signals in the same market

▣ Implications

- Democratization of expertise
- Implications for gaming in the longer run
- Testing a new dimension – product life cycle

▣ On-going work

- Additional tests, especially for endogeneity concern



UNIVERSITY OF MARYLAND

ROBERT H. SMITH SCHOOL OF BUSINESS



THANK YOU





Summary statistics (listing attributes)

Variable	All		Concept		Live	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Price	3.55	25.83	5.07	39.38	2.43	3.82
Max. Amount	18,643	34,529	22,222	37,407	15,265	30,726
Reserve	3,846	10.885	4,269	9,816	3,526	11,724
Apple (1=yes)	0.77	0.42	0.78	0.41	0.76	0.43
Company (1=yes)	0.61	0.49	0.66	0.47	0.57	0.50
Concept (1=yes)	0.42	0.49				



Summary statistics (funding outcome)

Variable	All		Concept		Live	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Amount funded	1,861	6,740	2,671	6,885	1,223	6,595
Number of investors	5.92	13.36	9.77	18.73	3.22	6.11
Fully funded (1=yes)	0.48	0.50	0.53	0.50	0.45	0.50
Number of observations	551		234		317	