

**A Study on the Success Factors of Online Peer-to-Peer Marketplaces**

By

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Marketplaces have existed for thousands of years, literally -- some of the notable, older ones include the Agora of Athens, Trajan's Market in Rome, and the Grand Bazaar in Istanbul. For much of history, marketplaces virtually remained the same: an open area where buyers and sellers meet and exchange goods. As history evolved, and with the arrival of the Industrial Revolution, the sellers evolved from being individuals to large corporations. For example, the farmer's market evolved into a supermarket, and large corporations replaced the farmers.

The internet brought these traditionally offline marketplaces online. With that, came a host of new features, like reviews, and the enablement of new behaviors, like instant price comparisons. In most instances, these online marketplaces, like Amazon, Expedia, Ticketmaster, and iTunes, still connect massive companies (and their products) to consumers.

However, as the internet developed, peer-to-peer marketplaces, like eBay and Craigslist, were created, harkening back to the markets of hundreds of years ago, where individuals would transact with fellow individuals.

The most recent iteration of the peer-to-peer marketplace, and the topic of this paper, is the peer-to-peer rental marketplace. Collectively, these comprise the "sharing economy." For the most part, these marketplaces allow users to frictionlessly rent goods (and in some cases, services) from other users.

## **Why I Include Gig Economy startups (“Uber for X”) in the P2P rental marketplace / Sharing Economy**

\*\* I include on-demand service startups (i.e., gig economy), in this category of peer-to-peer rental startups, since rather than people renting goods to each other, they’re renting their time. These startups are also known as “Uber for X” startups, given their business model resemblance to the ease-of-use, speed, and on-demand nature of Uber.

Examples of startups in this category would include Handy, TaskRabbit, Wag (on-demand dog walking), and Zeel (on-demand, in-home massages). Through Zeel, for example, the user rents the time of the masseuse (and effectively, their accompanying massage table, too). In Handy, a user is renting an electrician’s time (and effectively, their accompanying equipment, too).

Similar to P2P rental marketplace (“sharing economy”) startups, gig economy startups enable individuals on the demand-side to transact directly with individuals on the supply-side. For example, Handy allows a user to pay a plumber or landscaper directly, instead of going through Roto-Rooter or a landscaping agency, respectively; hence, my classification of them as peer-to-peer.

## **What caused the emergence of peer-to-peer rental marketplaces (“sharing economy startups”)?**

It is no coincidence that these startups emerged alongside the smartphone. Uber’s user experience, for example, would not be as seamless if phones did not have GPS, and thus, someone could not track the arrival of their ride, for example.

Many sharing economy startups also require a cost-effective way to run background checks, which would not be possible without Checkr, an API that performs this service and is used by Uber, Lyft, Postmates, GrubHub, and others. Checkr itself could not have existed before the mid-200s since it checks digital records from county and DMVs across the country. Many of these records either weren’t digitized or brought online until many years after the advent of the internet.

Interestingly, many gig economy startups were founded around the time of the Great Recession. The high jobless rate was a tailwind as unemployed people were willing to accept any job (or “gig”) that paid them a fair wage. The recession also made users more price-sensitive, another tailwind given sharing economy startups, like Airbnb, are often able to provide solutions that are more cost-effective than the incumbents.

## **Why P2P Rental Marketplaces (“Sharing Economy” Startups) are So Popular:**

By replacing intermediaries (brokers, agents, dispatchers, etc.) with technology, these startups provide certain advantages. Here are three examples:

**Lower Cost:** Many intermediaries (e.g., brokers) are human. By replacing costly labor with technology, these startups shift down the cost curve. In exchange for their service, these startups charge a “take rate” (shortened to “rake”), a percentage of the GMV / transaction volume, which is often smaller than what a human intermediary would, and can, charge.

**Convenient and Quicker:** Technology eliminates the need to travel to, or call, a broker. P2P marketplaces are also often available 24/7 rather than solely during business hours.

**Integrated Payment:** In the case of BlaBlaCar (a carpooling platform), the driver is paid digitally automatically. This is a better experience than the offline experience of asking the passenger for cash, or potentially, have the passenger evade the fair by abruptly leaving the car at the end of the trip.

## **Evolution of P2P Marketplaces in General (both “sharing economy” and otherwise)**

*Note: this section is based on the “What's Next for Marketplace Startups?” article by*

*Andreessen Horowitz. Link given in Works Cited.*

### **Part 1: Unspecialized and horizontal marketplaces (e.g. Craigslist).**

These marketplaces arose alongside the advent of the internet and often took physical or offline directories and put them online. (e.g. Craigslist was a digital version of help-wanted flyers that people stuck to telephone poles.)

They were broad, horizontal, and lacked basic marketplace features like reviews, ratings, and payments (the onus fell on the end-user to check out the service- or goods-provider). These directories primarily focused on the discovery part of the purchase funnel and users had to perform the other parts themselves, like conducting due-diligence, shipping of the goods, taking on risk of the other party not delivering (effectively acting as their own underwriter), etc.

### **Part 2: Basic, verticalized marketplaces (e.g., Airbnb, Homeadvisor, Trulia, Upwork)**

By being vertical-specific and constrained to a particular industry, the goods listed on these marketplaces had profiles that were more relevant to the service being offered (e.g., all profiles on Trulia include a number-of-bathrooms field, something not all homes listed on Craigslist, for example, are guaranteed to have). Being specialized also enabled them to offer other features (e.g., HomeAdvisor, a platform where users can book professionals like

plumbers, landscapers, painters, etc., has a button to request a quote from service providers.

Users don't have to compose an email from scratch, like they'd have to do on Craigslist).

Reviews were also more specialized (e.g., Airbnb could ask users to rate specific parts of the service, like cleanliness, noise level, etc.). Despite these added features, many of these platforms still acted as listing services (e.g., the appointment scheduling and payment still happened offline on Angie's List).

### Part 3: On-demand apps (e.g., Uber, Wag, Glamsquad, Doordash)

These apps are on-demand, meaning a user doesn't have to schedule an appointment to receive the service. They enable users to order services, often with just a few clicks on their app. The app handles the pricing of services and stuff like collecting credit card information. It also instantly connects the supply-side with the demand-side. (e.g., Handy allows users to have a qualified TV installation person show up at their home without the user having to call up firms one-by-one and set up an appointment). With Uber, riders are paired with drivers in a matter of minutes. Doordash customers' orders are immediately routed to the appropriate delivery person. Unlike previous platforms, these platforms are full-stack and closed the loop -- they handled top of the funnel (discovery), mid-funnel (delivery of service), and bottom of the funnel (payment and post-experience survey/review).

### Part 4: End-to-End Marketplaces (e.g. TheRealReal, StockX)

Whereas the speed of on-demand marketplaces is great for low-stakes and easy-to-deliver services, more complicated and hands-on tasks, like finding a babysitter or a buyer for your home, need a more careful approach. For example, while one can buy used, rare Air Jordans on Craigslist, the risks of receiving a counterfeit are high and people often don't have the necessary expertise to authenticate the goods themselves. Because of this common problem, the startup StockX obtains a used sneaker, authenticates and cleans it, and then lists it on its site for someone to buy. It's still a marketplace that connects buyers and sellers because the sellers can choose what price they want their sneakers to be listed on StockX for. Because of the additional service and trust delivered, managed marketplaces' fees are a higher percentage of the transaction than a normal marketplaces'.



## Literature Review

Mingming Cheng's co-citation analysis of research on the sharing economy reveals that the current research on the topic focuses on the following five topics areas:

Societal trends providing tailwinds for the sharing economy:

Traditionally, the easiest way for someone to signal wealth or status was for them to own a particular object, like a car or watch. However, Chen and Marx have researched why, in today's shifting consumer environment, that is no longer always true. For example, studies have partially attributed the rise of the sharing economy to consumers' appetite to reduce their effect on the environment (Schor & Fitzmaurice, Forno & Garibaldi, and Cohen & Munoz). By increasing the utilization of fixed assets, like houses, by using Airbnb, consumers reduce the environmental waste that comes along with constructing hotels. These large projects consume considerable economic resources and disrupt the surrounding environment. Another social tailwind that has accelerated millennials' shift to platforms like Airbnb is their desire for more genuine and native experiences (Sigala). When vacationing in Japan, why live in a Marriott when you can rent a 'minka'? Why eat pasta from the restaurant in the Hilton in Brazil when you can relish a home-cooked pamonha made by your Airbnb host? On a related note, Botsman and Rogers also highlighted consumer's desire for more social and friendly connections in what seems to be an increasingly discordant society. It is not surprising the sharing economy delivers on that promise. Rather than living alone in a sterilized, unemotional hotel room, Airbnb enables its guests to more authentically experience their destination's culture.

A number of studies have also been conducted on the social impact of these sharing economy platforms; Fang demonstrated that these platforms lead to an increase in job creation and upward mobility in the regions they operate. This makes sense given P2P marketplaces directly transfer money from the seller to the buyer: locals living in Airbnbs end up paying locals for their homes rather than enriching the pockets of large, international hotel corporations.

However, it is not all sunshine and rainbows: Schor and Fitzmaurice have pointed out that these newly minted jobs are not unionized, are sometimes more precarious than their predecessors (by not having safety measures and regulations in place), and they do not come with benefits like insurance or social security. Therefore, while these 'gig economy' jobs are more efficient from a market forces perspective by perfectly matching supply and demand to find the optimal clearing price, they are less socially optimal.

Consumer behavior:

Botsman and Rogers' 2010 book *The Rise of Collaborative Consumption* predated the popularization of the term "sharing economy" and detailed the rise of "models of consumption that emphasize usefulness over ownership, community over selfishness, and sustainability over novelty" (Botsman and Rogers). This is a notable behavior departing from the individualistic consumption practices popular prior to the popularization of the sharing economy. Bardhi and Eckhardt studied the elements that construct what they call "access-based consumption," which they characterize as buying/selling made possible by the free market and defined by someone being given the right to use an object for a limited time. They also discussed the social / psychological effects of such behavior. For example, when people own things, they often

assimilate part of the item into their representation of themselves. For example, an owner of a Prius might begin to think of themselves as a responsible, eco-friendly citizen. However, such behaviors are not possible with access-based consumption (i.e. the sharing economy).

#### Sharing behaviors:

Research has also been done on the effects of the “sharing” behavior created by these platforms, such as their contribution to “equality, mutuality, honesty, openness, empathy, and an ethic of care” (John, 2013). Lamberton and Rose conducted a study on what factors increase the likeliness of the existence of a given sharing economy marketplace and included the following: cases where the barriers for sharing are low and the upside easily recognizable, the relative supply and demand of the product, how heavily is people’s time of usage correlated to each other (e.g. people often watch TV at the same times, like at night, whereas their need for power drills is staggered), and people’s readiness to share (e.g. people don’t want to share toothbrushes, but will share dresses).

#### Trust:

A major factor in the success of sharing economy platforms is trust among users. Outsourcing trust to a platform and getting into a stranger’s car, or sharing a house with a stranger, involves not only logistical challenges for the platforms, like coordinating millions of background checks, but also social mindset evolution (Molz 2013). Users are not the only party these platforms have to engender the trust of. Governments are wary of how recklessly some of these startups ignore regulations, and potentially put their users’ safety in jeopardy, along

with other concerns, like ignoring disability compliance regulations and invading consumer rights (Juul, 2015; Rauch and Schleicher, 2015). Some of the platforms also serve as an economic threat in the regions they operate; Airbnb perpetuates housing shortages and increases average rent prices in some of its cities (Edelman and Geradin, 2015).

#### Innovation:

Lastly, research has also been conducted regarding the social and technological innovation the sharing economy heralds. In the early 21st century, society became more cognizant of the depletion of natural resources and turned to the internet as a way of attacking the problem by bringing online assets that were traditionally offline, thus increasing searchability, shareability, and utilization (Botsman and Rogers).

The success of online marketplaces is often judged by how much of their respective offline market they can capture and bring online. Certain platforms, like Uber, have gotten so large that they have expanded the size of the total addressable market, itself. Uber's alone has grown larger than the entire taxi market pre-Uber. Airbnb has made it possible for any homeowner or renter to start a hospitality business with virtually no upfront cost (Nadler, 2014). It has also allowed seasonal tourist destinations to better respond to increases in demand by expanding the supply of accommodations (Juul, 2015). Bringing offline goods online has resulted in numerous benefits.

Much of the academic research regarding this industry has focused on theoretical aspects, whether it be examining the role of social movements that have enabled these

startups to flourish or diving into how governments are responding to these massive, distributed P2P platforms. However, very little research has focused on the key determinants that enable particular sharing economy platforms to thrive.

While there have been some studies in this space, they often hone in on one particular determinant (or just a few) and do a deep dive. For example, Schmalensee's 2010 study analyzed the role of customer behavior and tastes to cross the critical mass hurdle platforms need to survive. Kietzmann's 2014 study looks at only ride-sharing / mobility sharing economy models, and within that, focuses primarily on the role that public transportation and elected officials play within a given city. Filippas, Horton, and Zeckhauser's study focused on only two product characteristics: frequency of usage (e.g., a toothbrush is used every day, whereas a canoe is used sparingly) and predictability of usage (e.g., the timing of the need for a tuxedo is often determined weeks or months in advance, whereas the timing of the need for a backup generator is unpredictable).

## Research Methodology

**Goal:** See how different characteristics affect the success of P2P marketplace startups.

**Step 1:** How do you make a list of P2P marketplace startups?

- First, I used various keywords to search Crunchbase to first get a list of as many marketplace startups as I could find. There are ~5,000. Then, I manually went through each of those marketplace startups to identify those that were also peer-to-peer. I found 553 of them.
- I then classified those 553 P2P marketplace startups into 93 categories. E.g. Uber and Lyft are both “ridesharing” and Doordash and Grubhub are both “food-delivery.”

**Step 2:** How do you measure “success”?

- Ideally, you would use a metric like revenue or valuation. However, since there isn’t much public data on individual startups’ revenue or valuations, I used the following metric: amount of funding raised.
- I know this is an imperfect metric since a startup (like WeWork) can raise a lot of funding and still be a failure, but it was the best metric available to me.

**Step 3:** Come up with a list of characteristics you want to test.

- However, all P2P marketplace startups don't have the same characteristics. For example, Rent The Runway has different characteristics than Uber, so you can't run the same experiment on both.

So:

I took the 93 categories of P2P marketplace startups and divided them into 3 groups:

- P2P Service (On-Demand) Marketplaces
  - E.g. Uber, Lyft, Doordash, on-demand laundry, on-demand house cleaning, etc.
- P2P Rental Marketplaces
  - E.g. Airbnb, RentTheRunway
- P2P Non-Rental Marketplaces
  - Craigslist, Poshmark, Artsy, Freelancer.com

I then came up with characteristics to judge each of the groups:

**Group 1: P2P Service (On-Demand) Marketplaces**

*E.g. Uber, Lyft, Doordash, on-demand laundry, on-demand house cleaning, etc.*

**Characteristics to test:**

- Liquidity
- # of Competing Startups
- Gross Margin Per Order
- Frequency of the Service Used
- Ability for Service to Be Delivered via Online
- Price Sensitivity of Consumer in Market
- Consumer's Ability to Forecast Timing of Need for Usage of the Service
- Existence of Geographic Price Arbitrage

**Group 2: P2P Rental Marketplaces**

*E.g. Airbnb, RentTheRunway*

**Characteristics to test:**

- Price of Item
- Durability of Item
- Level of Concurrent Use of Item
- Frequency of Item's Use
- Insurability of Item
- Friction in Obtaining and Returning the Item



- Liquidity in Market
- Number of Competitors in Market

**Group 3: P2P Non-Rental Marketplace**

*E.g. Craigslist, Poshmark, Artsy, Freelancer.com*

**Characteristics to test:**

- Liquidity in Market
- Price of Item
- Cost of Shipping the Item Compared to the Price of Item
- Ability for Item to be Delivered via Online
- Ability for Buyer to Verify Quality of Item

Using my best estimate, I evaluated all the startups within a group from 0-10 against each of the characteristics of the group.

### Group 1: P2P Service (On-Demand) Marketplaces

*E.g. Uber, Lyft, Doordash, on-demand laundry, on-demand house cleaning, etc.*

The rightmost column shows the median funding each of the 53 P2P marketplace categories in this group.

I sorted the 53 categories by lowest-to-highest median funding and only used the middle 50% for the experiments because there are a lot of outliers, both low and high:

	Liquidity	# of Competing Startups	Gross Margin Per Order	Frequency of the Service Used	Ability for Service to Be Delivered via Online	Price Sensitivity of Consumer in Market	Consumer's Ability to Forecast Timing of Need for Usage of the Service	Geographic Price Arbitrage	Median Funding
On-demand carpooling	7	3	2	8	0	6	9	0	\$25,000
On-demand trainers	6	4	5	5	0	6	5	0	\$27,606
On-demand truck rental	3	2	5	2	0	5	4	0	\$40,000
On-demand dietitian (online)	10	2	4	5	1	4	6	1	\$50,000
On-demand tow truck	3	1	4	2	0	5	4	0	\$50,000
On-demand bartenders	6		4	3	0	5	5	0	\$120,000
On-demand experiences	5	4	6	3	0	3	7	0	\$157,500
On-demand gas delivery	3	2	3	4	0	8	4	0	\$275,000
On-demand delivery (general)	7	5	4	5	0	6	5	0	\$304,649
On-demand massage	4	3	7	3	0	5	5	0	\$309,569
On-demand laundry	4	4	4	6	0	7	5	0	\$376,675
On-demand vets (online)	10	2	7	4	1	4	3	1	\$418,973
On-demand valet	6	2	5	4	0	3	3	0	\$435,000
On-demand car wash	4	2	2	2	0	5	7	0	\$445,000
<b>On-demand tutoring (online)</b>	<b>10</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>4</b>	<b>7</b>	<b>1</b>	<b>\$500,000</b>
<b>On-demand photographers</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>\$501,042</b>

On-demand electronic repair	6	2	6	1	0	5	1	0	\$518,138
On-demand pharmacy	6	4	6	3	0	5	5	0	\$750,000
On-demand pet groomers	4	3	5	3	0	4	5	0	\$800,000
On-demand IVs	3	1	6	3	0	5	2	0	\$870,000
On-demand moving	5	4	6	1	0	5	6	0	\$910,573
On-demand ridesharing	9	4	4	8	0	7	3	0	\$960,000
On-demand beauty services	8	2	7	3	0	5	7	0	\$975,000
On-demand coaches (online)	10	3	5	4	1	4	6	1	\$1,042,009
On-demand cleaning	8	5	4	6	0	7	7	0	\$1,075,000
On-demand chef	5	2	5	2	0	5	7	0	\$1,270,000
On-demand food delivery	8	7	3	8	0	7	5	0	\$1,500,000
On-demand mechanic	6	2	5	2	0	6	2	0	\$1,920,000
On-demand psychic (online)	10	1	5	3	1	3	5	1	\$2,000,000
On-demand groceries	7	5	4	6	0	7	5	0	\$2,000,000
On-demand doctors (online)	10	3	9	4	1	3	2	1	\$2,006,263
On-demand childcare	7	4	5	7	0	5	9	0	\$2,051,050
On-demand storage	7	2	5	3	0	5	7	0	\$2,200,000
On-demand services (general)	3	5	4	4	0	5	5	0	\$2,375,040
On-demand home services	7	6	7	3	0	5	3	0	\$2,750,000
On-demand lawyers (online)	10	1	9	2	1	4	1	1	\$3,255,024
On-demand caterers	6	3	7	3	0	5	7	0	\$3,584,232
On-demand therapists (online)	10	5	7	5	1	4	5	1	\$3,600,000
On-demand experts (online)	10	3	6	3	1	5	5	1	\$4,850,000
On-demand coders (online)	10	5	7	4	1	4	6	1	\$5,017,963

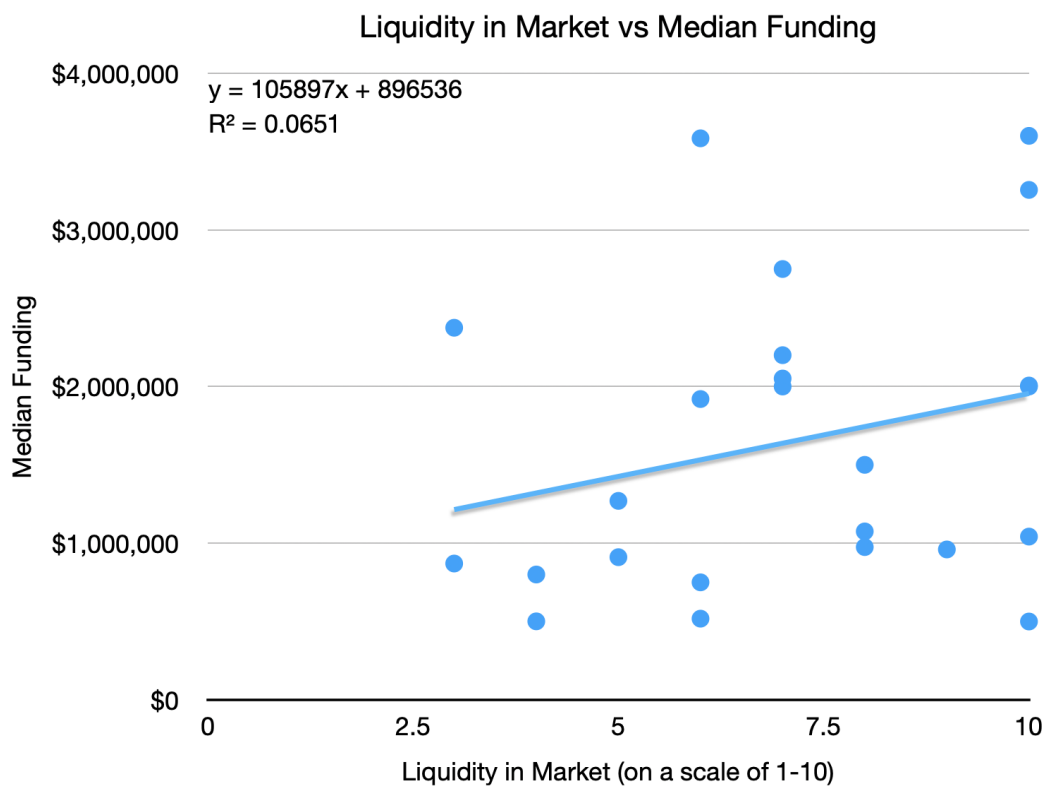
On-demand flower delivery	3	2	4	2	0	5	3	0	\$5,644,223
On-demand dog sitting	8	3	3	3	0	5	5	0	\$6,494,268
On-demand accountant (online)	10	3	6	3	1	3	7	1	\$8,963,121
On-demand workspace availability	4	2	4	6	0	6	7	0	\$9,030,000
On-demand digital goods	10	5	5	5	1	5	5	1	\$9,330,000
On-demand travel experts (online)	10	2	6	2	1	5	7	1	\$10,454,496
On-demand caregivers	5	4	5	5	0	6	7	0	\$16,575,000
On-demand lawn care	5	2	4	5	0	5	7	0	\$17,607,500
On-demand interior designers (online)	10	3	4	2	1	4	7	1	\$25,500,000
On-demand freelancers (online)	10	6	5	5	1	5	5	1	\$36,227,661
On-demand alcohol delivery	7	4	4	6	0	7	3	0	\$69,560,722
On-demand cannabis delivery	4	3	3	6	0	5	3	0	\$202,500,000
On-demand wedding professionals	7	3	7	2	0	3	9	0	\$381,065,000

**Experiment #1:** How does liquidity of supply affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** Higher liquidity increases the odds of success.

**Reasoning:** The more liquidity in a market, the better the matches. For example, all else equal, a market for on-demand tutors would perform better than that for on-demand car washers since there are more of the former than the latter.

**Experiment Result:**



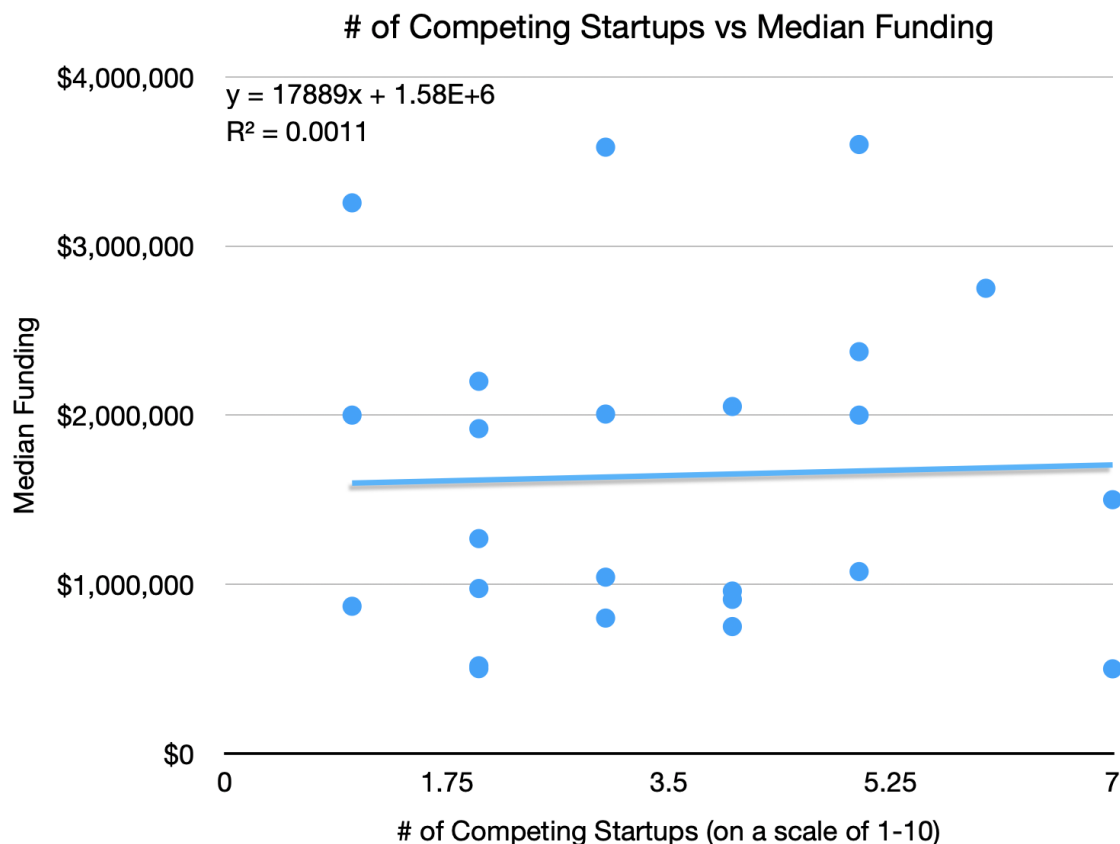
**Hypothesis:** Correct

**Experiment #2:** How does the number of competitors affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** Inverse correlation between the number of competitors and odds of success

**Reasoning:** When a space has multiple, well-capitalized players, often it becomes a price race to the bottom where companies sell products below their COGS, create negative gross margin, and burn VC dollars in order to gain market share and hopefully force the competitors out of business, after which it can raise prices again. This has happened in the ridesharing (domestically and internationally) and food delivery business.

**Experiment Result:**



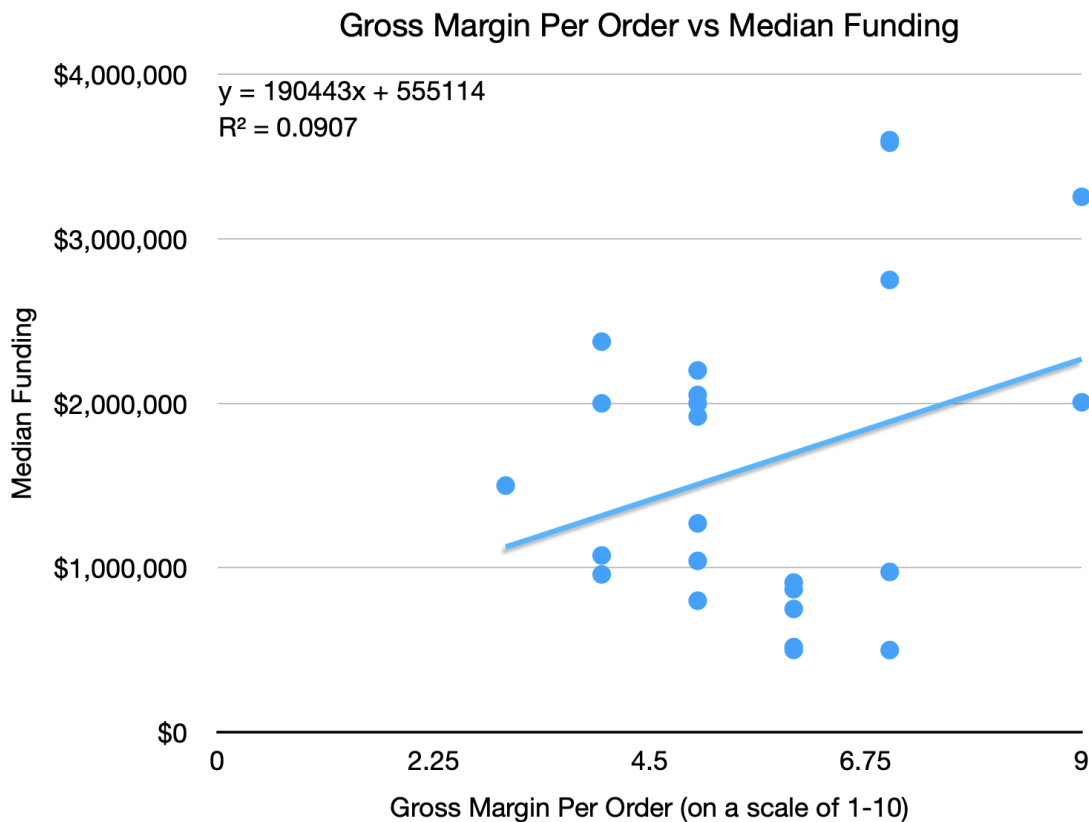
**Hypothesis:** Incorrect

**Experiment #3:** How does gross margin per order affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** Higher gross margin increases the odds of success.

**Reasoning:** Fixed costs across on-demand businesses are fairly similar: they involve the travel time for the service provider (SP) to go to the customer's home. By that reasoning, an on-demand hairstyling business (margin of \$100+ per visit) would do better than an on-demand laundry business (margin of <\$20 per visit).

**Experiment Result:**



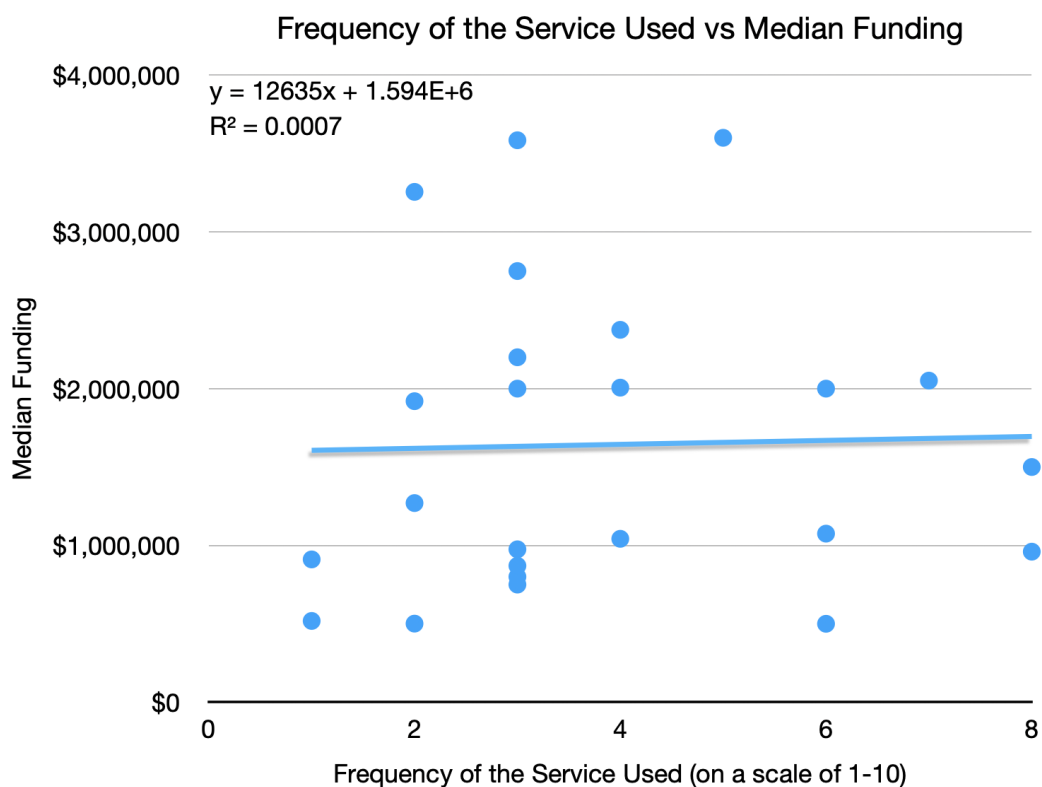
**Hypothesis:** Correct

**Experiment #4:** How does the frequency of the service used affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** Increased frequency increases the odds of success

**Example:** Assuming customer acquisition costs are similar across on-demand businesses, more usage per customer = higher LTV = higher profit.

**Experiment Result:**



**Hypothesis:** Correct

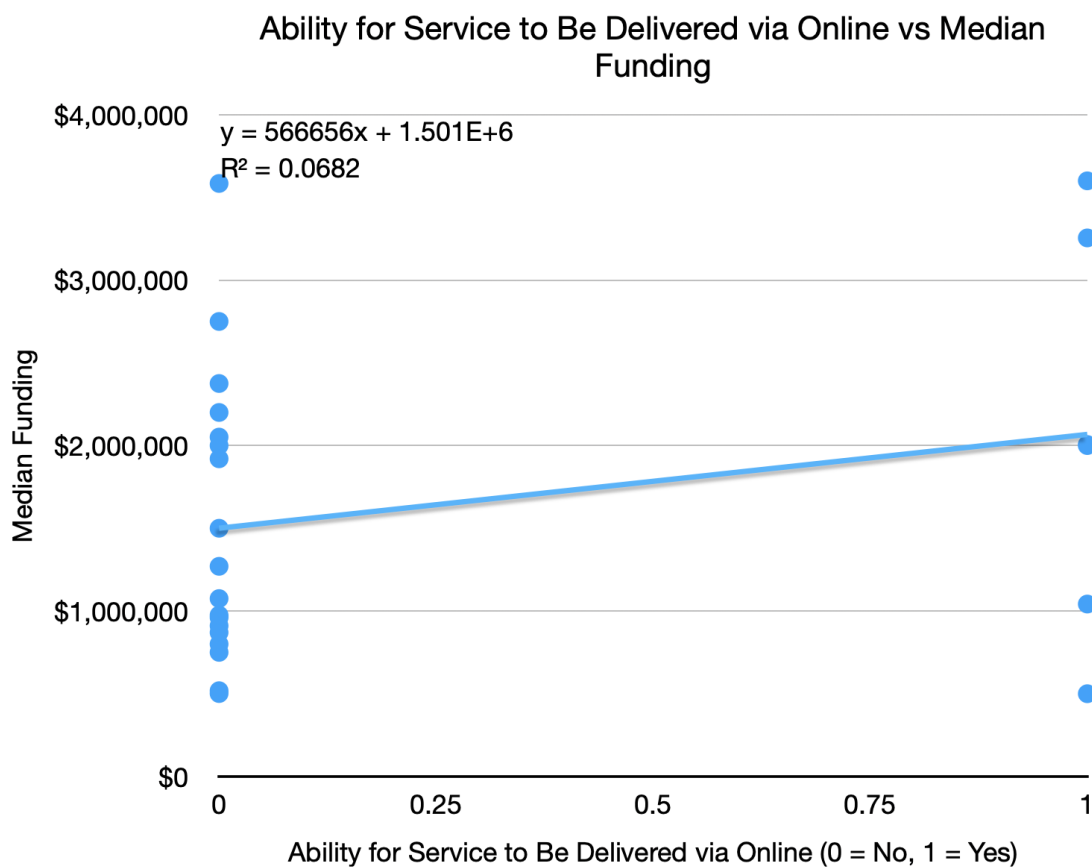


**Experiment #5:** How does the ability for the service to be delivered via online affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** Ability to be delivered via online is correlated with odds of success

**Reasoning:** Online delivery (e.g. on-demand doctor's visits via video chat) doesn't involve costs of going to the consumer's home, like in, say, an on-demand laundry business.

**Experiment Result:**



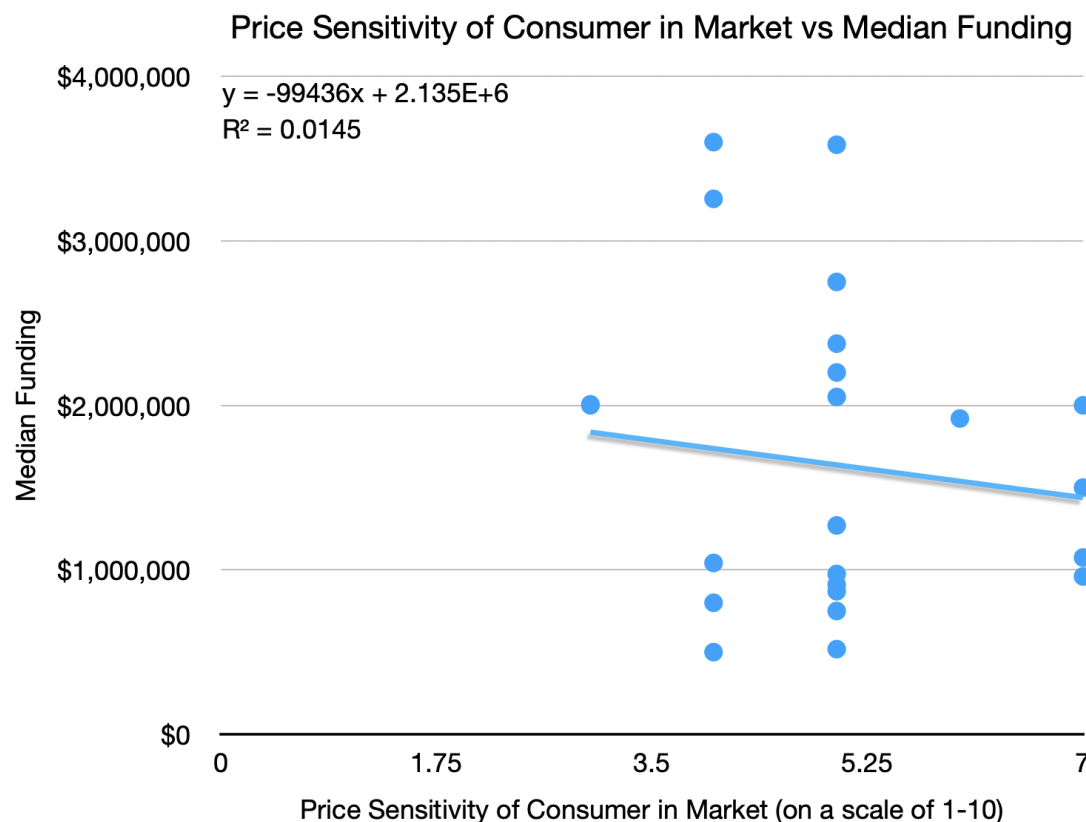
**Hypothesis:** Correct

**Experiment #6:** How does the consumer's price sensitivity in a market affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** Consumers' price sensitivity is inversely correlated with odds of success

**Reasoning:** P2P on-demand marketplaces compete with the consumer doing the service themselves (e.g. using Doordash to get food vs. going to the restaurant themselves). If consumers are more price sensitive in a particular market (e.g. food delivery), then the startup will see less business. However, if the consumer isn't very price sensitive (e.g. on-demand lawyers via video chat), then the startup will do well. In other words, the more consumers are willing to pay extra for convenience, the better the startup will do.

**Experiment Result:**



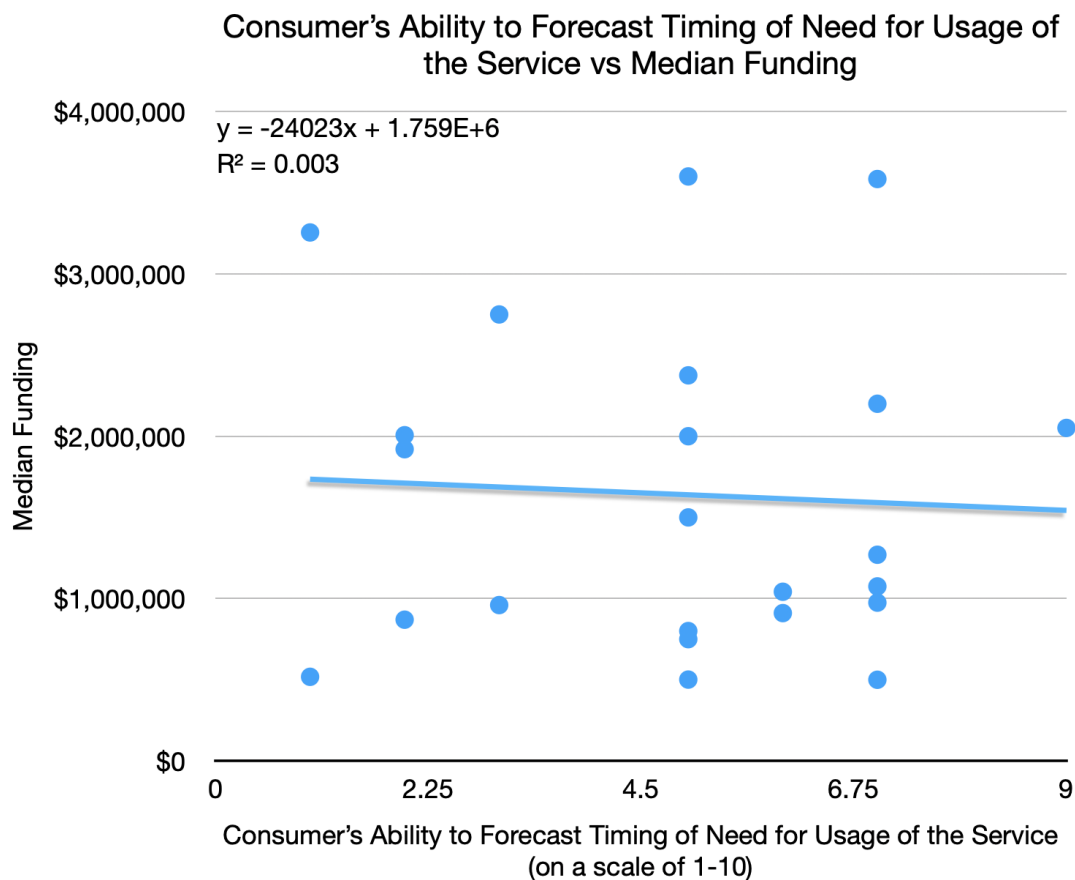
**Hypothesis:** incorrect

**Experiment #7:** How does the consumer's ability to forecast the timing of the need for usage of the service affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** The consumer's ability to forecast the timing is inversely correlated with the startup's odds of success

**Reasoning:** If someone can predict when they will need something, then they don't need to use an on-demand service. However, if they can't predict when, say, their meeting will end, then they will want to use an on-demand service like Uber.

**Experiment Result:**



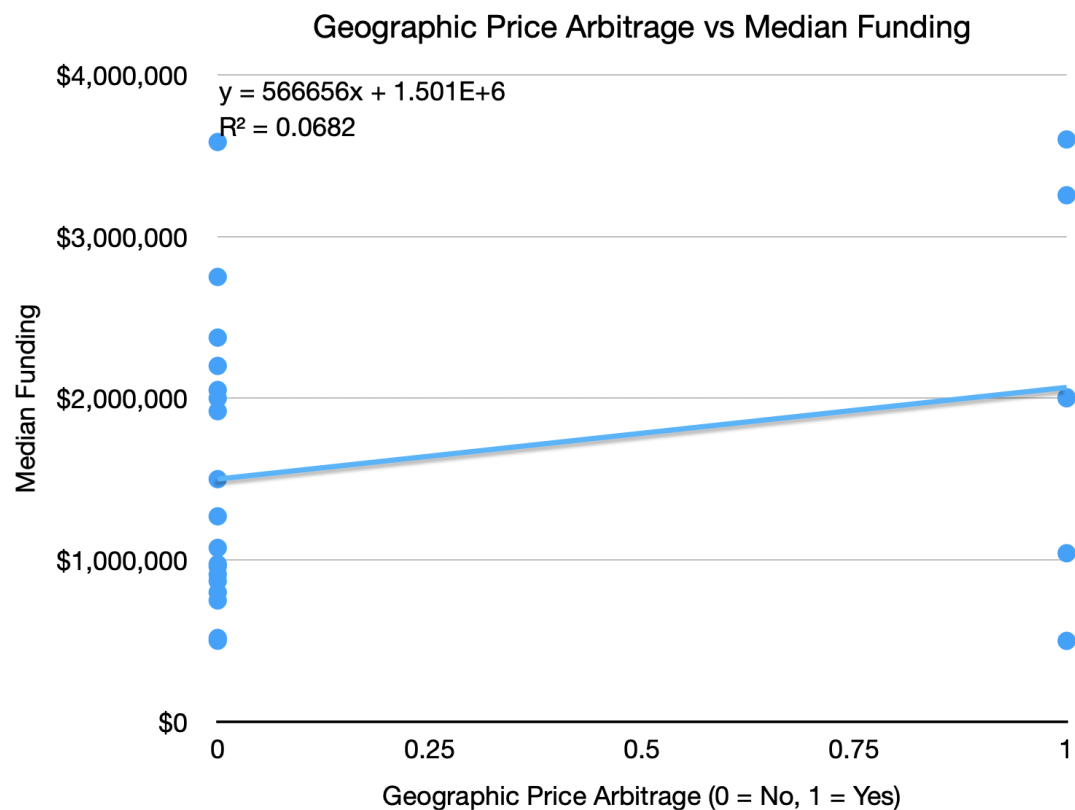
**Hypothesis:** Correct

**Experiment #8:** How does geographic price arbitrage affect a (P2P) on-demand marketplace startup's odds of success?

**Hypothesis:** The existence of the opportunity for geographic price arbitrage is correlated with the startup's odds of success.

**Reasoning:** If an on-demand service is delivered online, like via video chat (e.g. on-demand therapists), then the service can charge a lower price than the local price in the consumer's market by obtaining therapists from a cheaper labor market. (e.g. a NYC resident chatting with a therapist from Arkansas.)

**Experiment Result:**



**Hypothesis:** Correct

## Group 2: P2P Rental Marketplaces

*E.g. Airbnb, RentTheRunway*

The rightmost column shows the median funding each of the 15 P2P marketplace categories in this group.

I sorted the 15 categories by lowest-to-highest median funding and only used the middle 50% for the experiments because there are a lot of outliers, both low and high:

	Price of Item	Durability of Item	Level of Concurrent Use of Item	Frequency of Item's Use	Insurability of Item	Friction in Obtaining and Returning the Item	Liquidity in Market	Number of Competitors in Market	Median Funding
P2P instrument rental	6	7	3	4	4	7	6	4	\$20,107
P2P baby gear rental marketplace	5	5	3	4	3	6	4	3	\$40,000
P2P construction tool rental	7	7	2	2	4	6	4	4	\$71,207
<b>P2P drone rental</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>\$250,000</b>
<b>P2P rentals (general)</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>\$289,000</b>
<b>P2P clothing rental</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>8</b>	<b>10</b>	<b>10</b>	<b>\$803,484</b>
On-demand motorcycle rental	7	7	4	3	7	5	6	5	\$857,882
P2P car rental	9	6	3	5	8	4	9	8	\$1,275,000
P2P boat rental	10	8	3	3	10	4	7	4	\$1,487,763
P2P travel equipment rental	5	5	3	3	3	6	4	4	\$1,736,000
P2P sports gear rental	5	6	6	3	2	6	6	4	\$2,275,000
<b>P2P home rental</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>\$10,100,000</b>
P2P RV rental	9	8	6	2	6	6	5	4	\$16,184,586

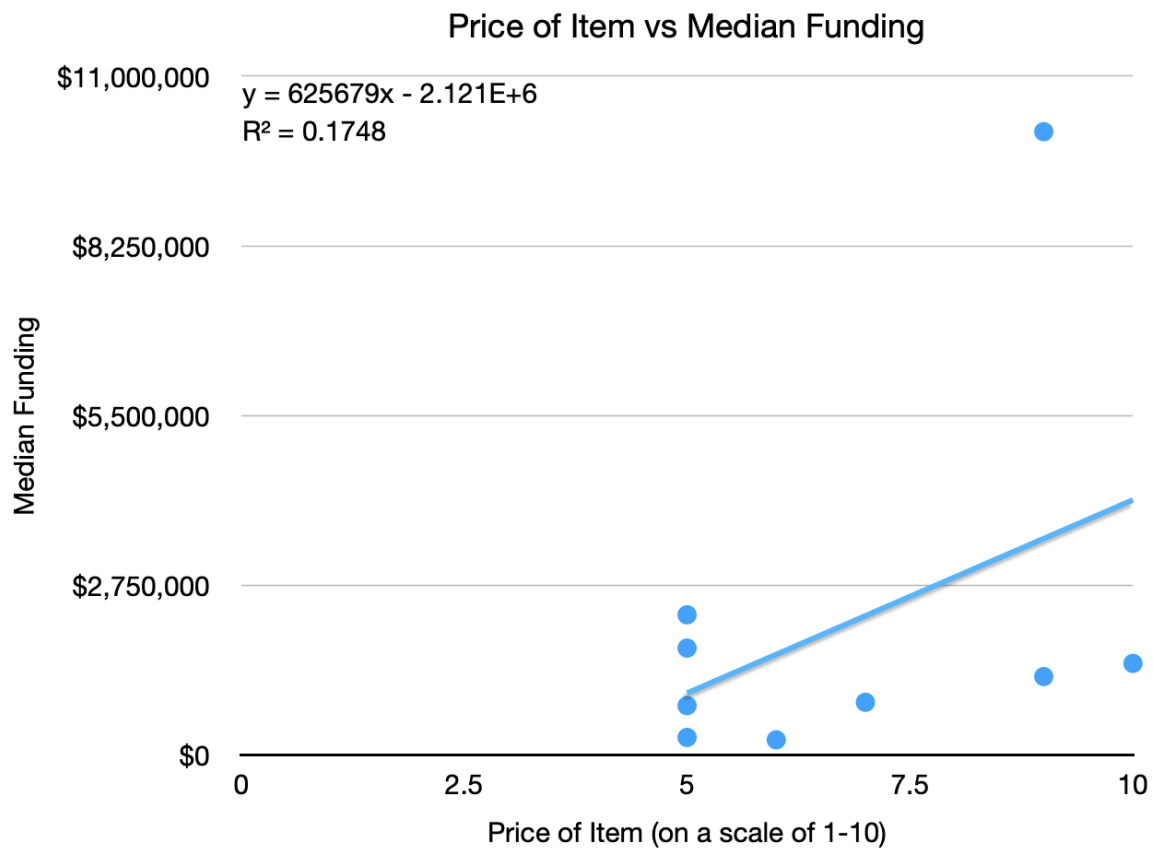
P2P camp ground rental marketplace	5	8	6	3	6	4	7	5	\$17,276,485
P2P plane rental	10	10	3	3	10	4	4	3	\$130,200,000

**Experiment #9:** How does the price of an item affect a (P2P) rental marketplace startup's odds of success?

**Hypothesis:** Unsure

**Reasoning:** The more expensive something is, the more someone will want to rent it than buy it, so the rental marketplace startup will likely succeed. However, if an item is too expensive, the chances of it breaking go up, and thus the probability the owner listing it on a rental platform decreases.

**Experiment Result:**

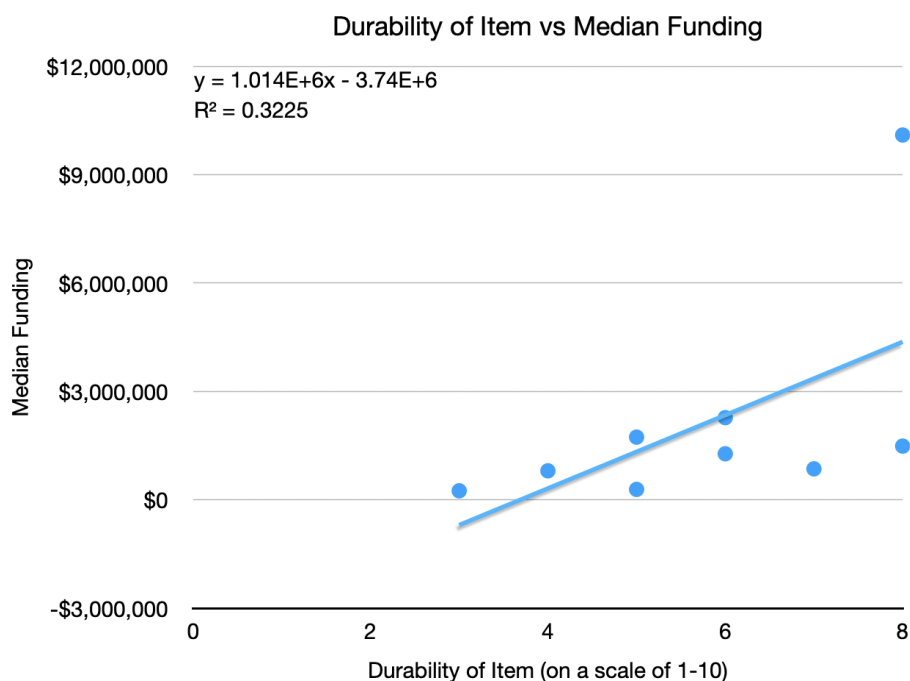


**Experiment #10:** How does the durability of an item affect a (P2P) rental marketplace startup's odds of success?

**Hypothesis:** Durability is correlated with odds of success

**Reasoning:** Items that are more fragile are less likely to be in the sharing economy. There are some interesting dynamics when it is hard to tell if a product has been “damaged” after it has been used. For example, on the car rental platform Turo, a customer can drive excessively quickly and brake too forcefully repeatedly, ultimately straining the engine and wearing out the brakes, but it is hard for the owner to know immediately after getting the car back since the effects show up after a prolonged time. Put in another way, the more durable an item, the more amount of liquidity on the supply-side of the marketplace. (e.g. No one wants to rent out antiques, but people will rent out durable power-tools)

**Experiment Result:**



**Hypothesis:** Correct

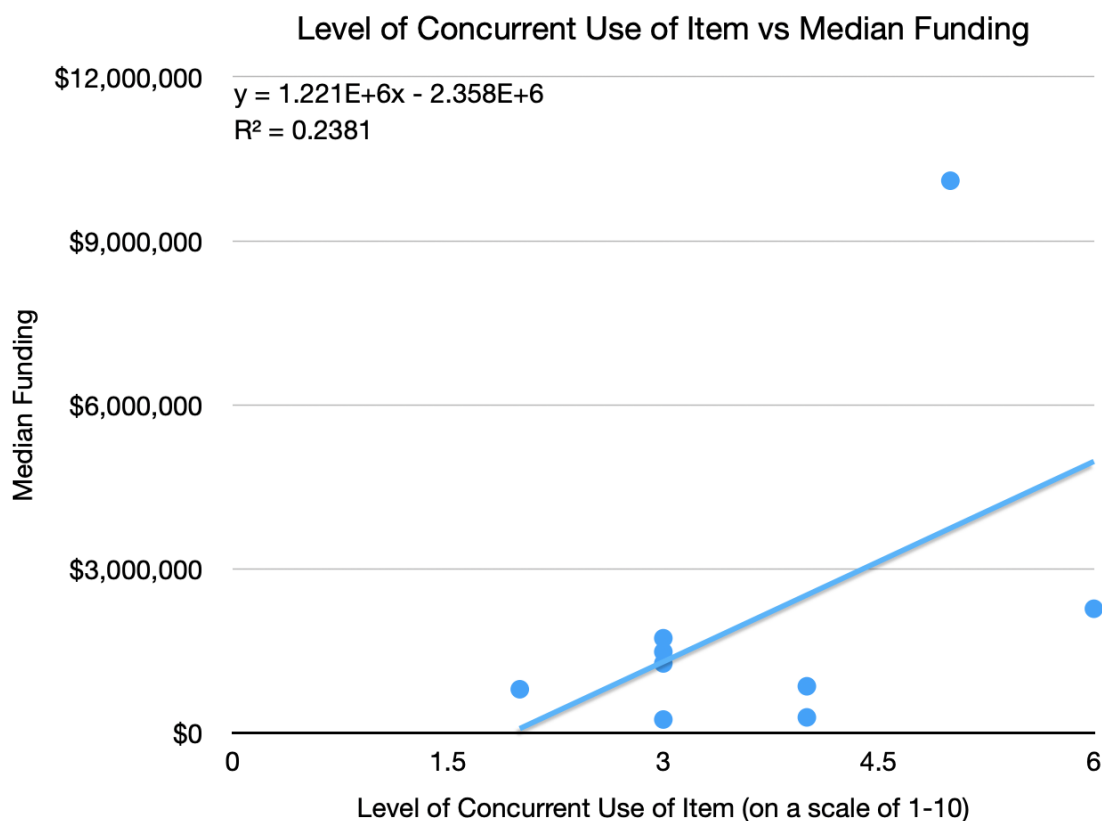


**Experiment #11:** How does the level of concurrent use of Item affect a (P2P) rental marketplace startup's odds of success?

**Hypothesis:** Level of concurrent use is inversely correlated with the odds of success

**Reasoning:** For Airbnb hosts, there is a fairly predictable flow of customers throughout the year. However, for something like a back-up electric generator, in a given area, either power is working, and no one needs it, or the power goes off, and everyone needs it at the same. An electric generator marketplace is either always going to be extremely demand-constrained or supply-constrained. The same goes for a coffee machine rental marketplace -- they won't work since everyone needs coffee at the same time (the mornings).

**Experiment Result:**



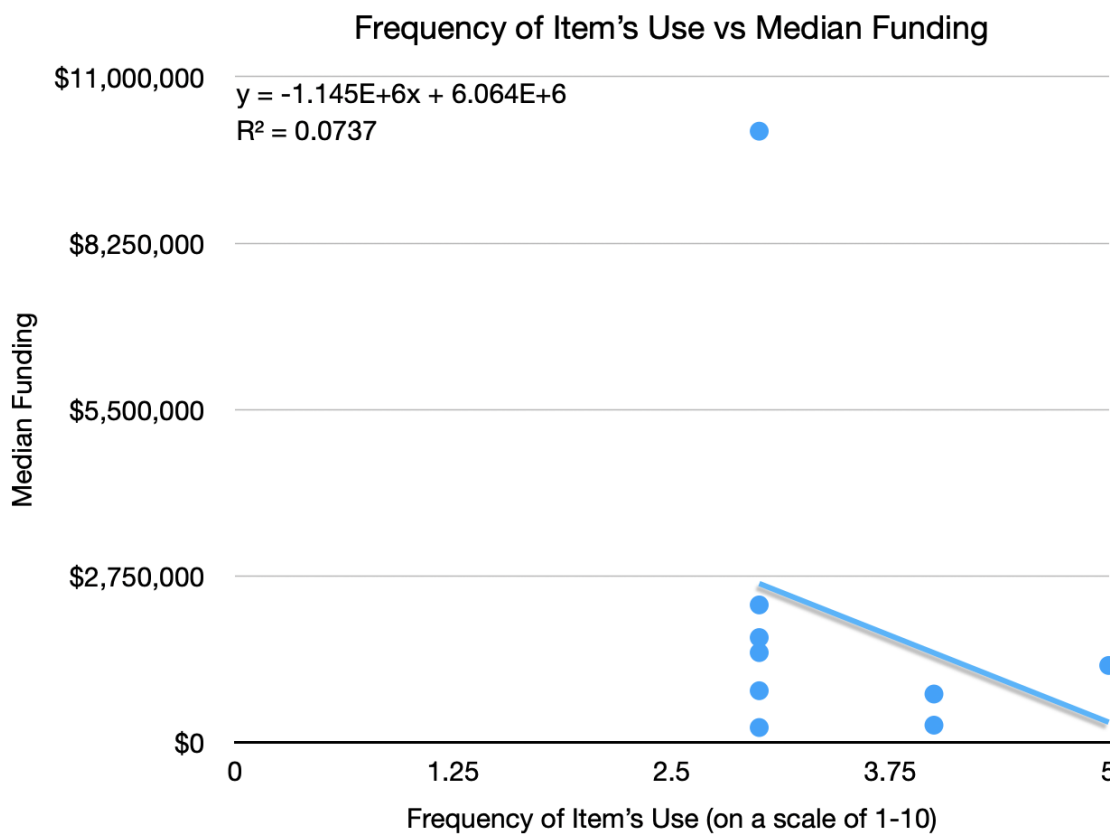
**Hypothesis:** Incorrect

**Experiment #12:** How does the frequency of item's use affect a (P2P) rental marketplace startup's odds of success?

**Hypothesis:** Frequency is inversely correlated with odds of success

**Reasoning:** If you need an item semi-frequently, you might as well buy it, even if it's not cheap (e.g., a blender or grill). If you don't need it too often, then the CLV won't be high enough to get enough repeat purchases and break even on customer acquisition costs.

**Experiment Result:**



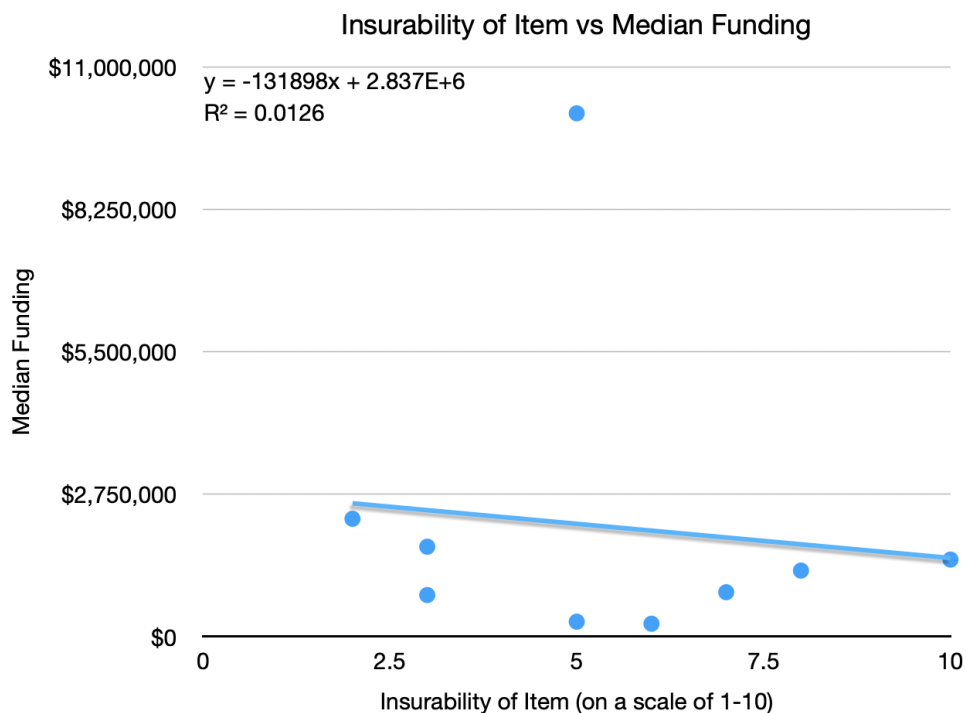
**Hypothesis:** Correct

**Experiment #13:** How does the insurability of an item affect a (P2P) rental marketplace startup's odds of success?

**Hypothesis:** Insurability is correlated with the odds of success.

**Reasoning:** If a product is a high-value item, the marketplace will want to offer insurance to the supplier. However, to get an insurance policy, the item had to be appraised, which takes time and money, adding friction to the sign-up process. For example, it might be hard to start a P2P high-end photography equipment rental marketplace. However, a centralized rental platform (like one offered at a Best Buy, B&H, or Adorama) would make sense since it is easier to create an insurance policy for a bunch of items at once that are owned by the same person. Also, since there is one supplier, and there are many items being renting out, any loss gets amortized across multiple rentals, and thus, the supplier might not even need an insurance policy).

**Experiment Result:**



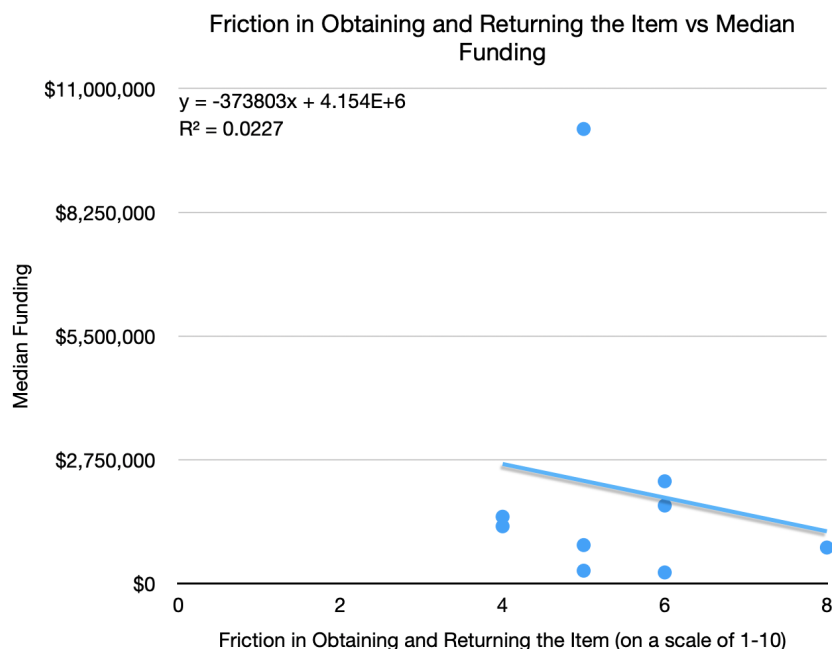
**Hypothesis:** Incorrect

**Experiment #14:** How does the friction in obtaining and returning the item affect a (P2P) rental marketplace startup's odds of success?

**Hypothesis:** Friction is inversely correlated with the odds of success.

**Reasoning:** If the item is being picked up from and dropped off to the counterparty, it requires aligning schedules twice. Plus, there's driving time to and from the pick-up/drop-off point to account for. A nifty solution that I saw a P2P rental marketplace startup use this summer was to have a customer pick up the dress at a dry cleaner and return it back to the dry cleaner when done, to be cleaned, after which the next person could pick it up (and drop it off) there. This eliminates the need to align schedules with the counterparty. Plus, it saves the counterparty from having to drive to the dry cleaner after each rental. Lastly, it reduced driving time for the customer because they can plan their schedule in such a way that they can pick up the dress when they happen to be in that area next. Breather (which enables people to rent a meeting room/workspace for a few hours) has the owner of the space install a smart lock on the door, so they don't have to be physically present every time a renter checks in.

**Experiment Result:**



**Hypothesis:** Correct

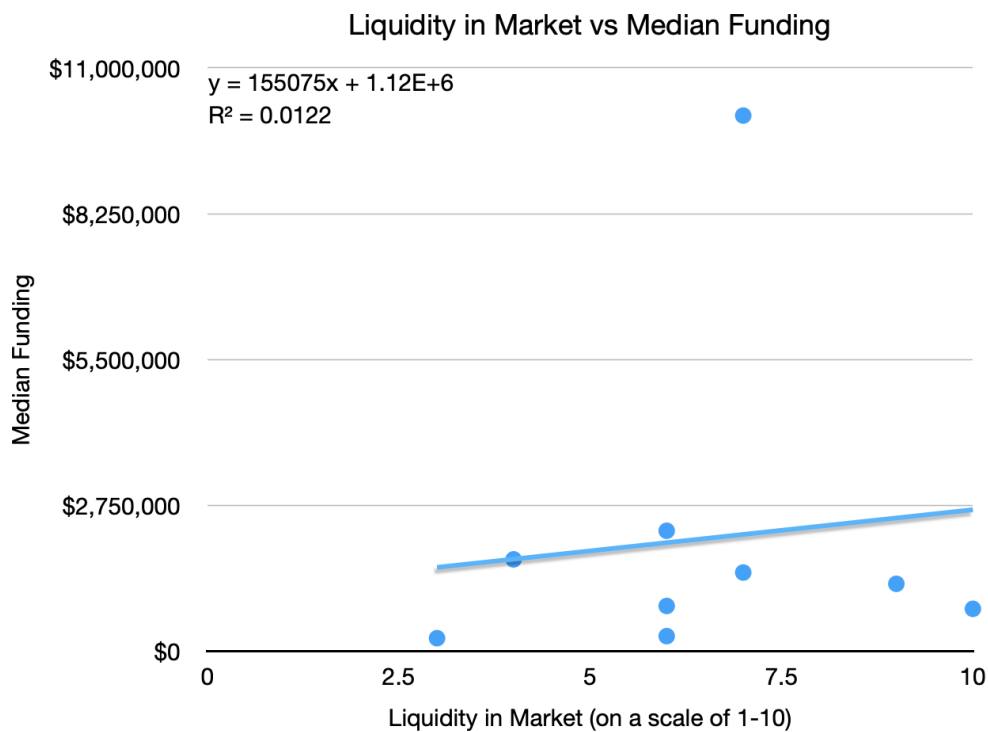
**Experiment #15:** How does liquidity of supply affect a (P2P) rental marketplace startup's odds of success?

**Note:** Experiment #1 was also related to the liquidity of supply, but that was regarding P2P *on-demand* marketplace startups. This is regarding P2P *rental* marketplace startups.

**Hypothesis:** Higher liquidity increases the odds of success.

**Reasoning:** Same as in Experiment #1.

**Experiment Result:**



**Hypothesis:** Correct

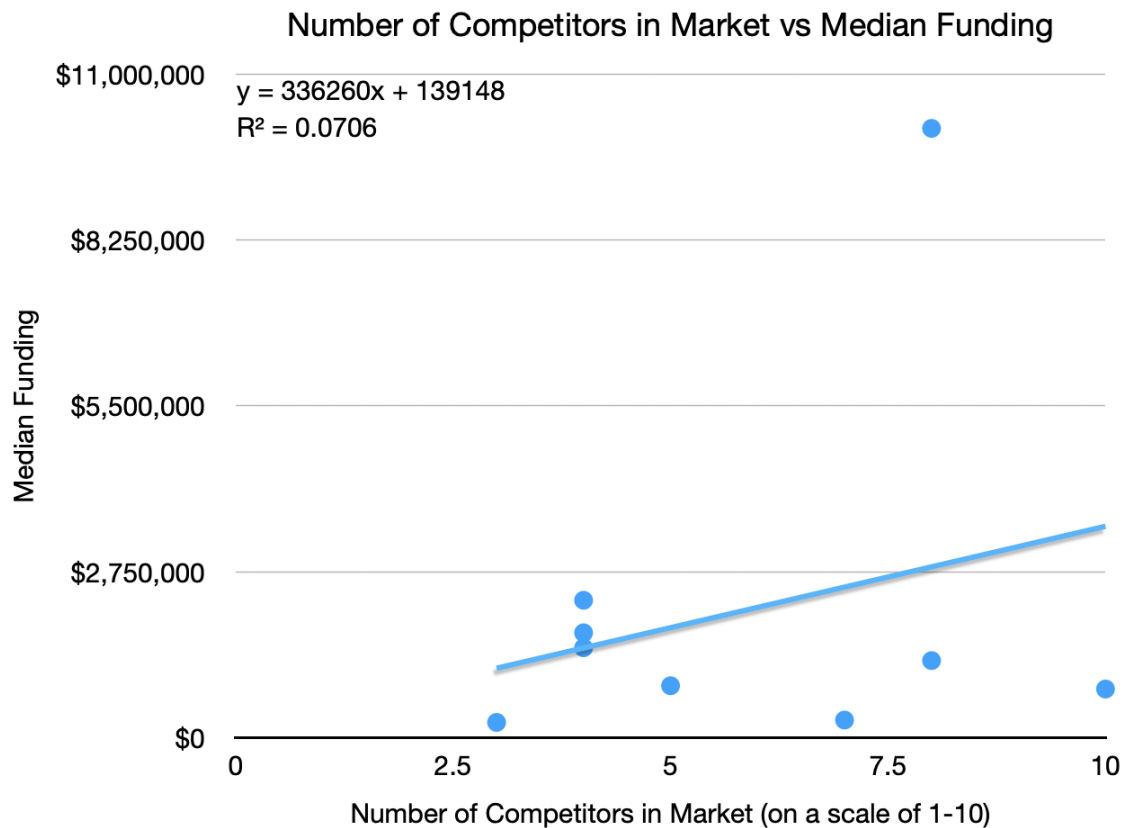
**Experiment #16:** How does the number of competitors in a market affect a (P2P) rental marketplace startup's odds of success?

**Note:** Experiment #2 was also related to the number of competitors in a market, but that was regarding P2P *on-demand* marketplace startups. This is regarding P2P *rental* marketplace startups.

**Hypothesis:** Inverse correlation between the number of competitors and odds of success

**Reasoning:** Same as in Experiment #2

**Experiment Result:**



**Hypothesis:** Incorrect

**Group 3: P2P Non-Rental Marketplace**  
*E.g. Craigslist, Poshmark, Artsy, Freelancer.com*

The rightmost column shows the median funding each of the 25 P2P marketplace categories in this group.

I sorted the 25 categories by lowest-to-highest median funding and only used the middle 50% for the experiments because there are a lot of outliers, both low and high:

	Liquidity in Market	Price of Item	Cost of Shipping the Item Compared to the Price of Item	Ability for Item to be Delivered via Online	Ability for Buyer to Verify Quality of Item	Median Funding
P2P food marketplace	5	4	6	0	7	\$200,000
P2P home-made food marketplace	3	5	8	0	3	\$332,198
P2P parking spot marketplace	7	5	0	1	10	\$491,667
P2P cross-border goods marketplace	4	6	7	0	8	\$520,000
P2P video game marketplace	7	4	4	0	6	\$550,000
P2P flight tickets, hotel reservations	4	6	0	1	9	\$870,024
<b>P2P storage</b>	<b>6</b>	<b>4</b>	<b>6</b>	<b>0</b>	<b>5</b>	<b>\$1,375,000</b>
<b>P2P loans</b>	<b>7</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>\$1,624,844</b>
<b>P2P vintage marketplace</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>\$1,800,000</b>
<b>P2P home selling</b>	<b>9</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>\$2,000,000</b>
<b>P2P furniture marketplace</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>\$2,257,500</b>
<b>P2P educational materials marketplace</b>	<b>9</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>\$2,295,311</b>
<b>P2P clothing marketplace</b>	<b>5</b>	<b>3</b>	<b>8</b>	<b>0</b>	<b>5</b>	<b>\$4,850,000</b>
<b>P2P shoe marketplace</b>	<b>7</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>7</b>	<b>\$5,600,000</b>
<b>P2P art marketplace</b>	<b>8</b>	<b>8</b>	<b>5</b>	<b>0</b>	<b>8</b>	<b>\$12,200,000</b>

<b>P2P hand-made goods marketplace</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>\$14,096,283</b>
<b>P2P marketplace (general)</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>\$14,652,669</b>
<b>P2P gift card marketplace</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>\$17,350,000</b>
<b>P2P photography equipment marketplace</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>\$20,988,088</b>
P2P car marketplace	8	7	8	0	7	\$21,000,000
P2P music gear marketplace	4	6	5	0	5	\$23,700,000
P2P ticket marketplace	8	6	0	1	10	\$26,800,000
P2P luxury good marketplace	6	8	4	0	6	\$39,320,131
P2P electronics marketplace	6	5	4	0	5	\$51,612,506
P2P doctor marketplace	6	8	0	1	8	\$223,000,000



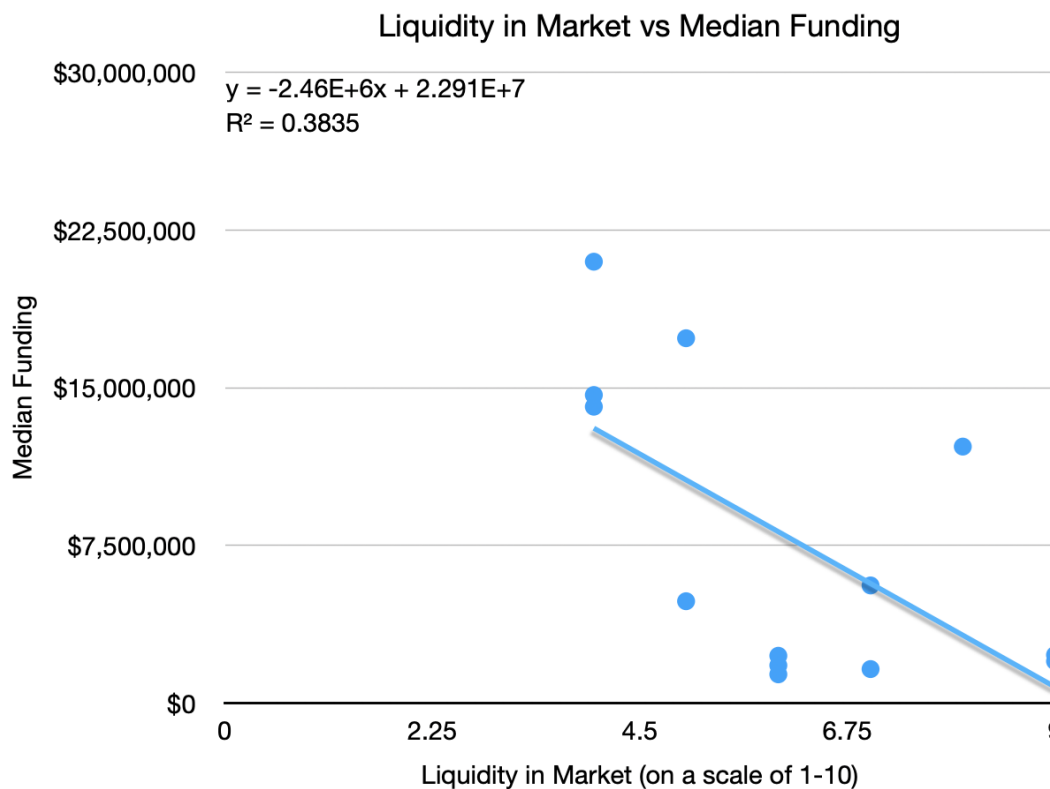
**Experiment #17:** How does liquidity of supply affect a (P2P) non-rental marketplace startup's odds of success?

**Note:** Experiments #1 and 15 were also related to the liquidity of supply, but they were regarding P2P **on-demand** marketplace startups and P2P **rental** marketplace startups, respectively. This is about P2P **non-rental** marketplace startups.

**Hypothesis:** Higher liquidity increases the odds of success.

**Reasoning:** Same as in Experiment #1.

**Experiment Result:**



**Hypothesis:** Incorrect

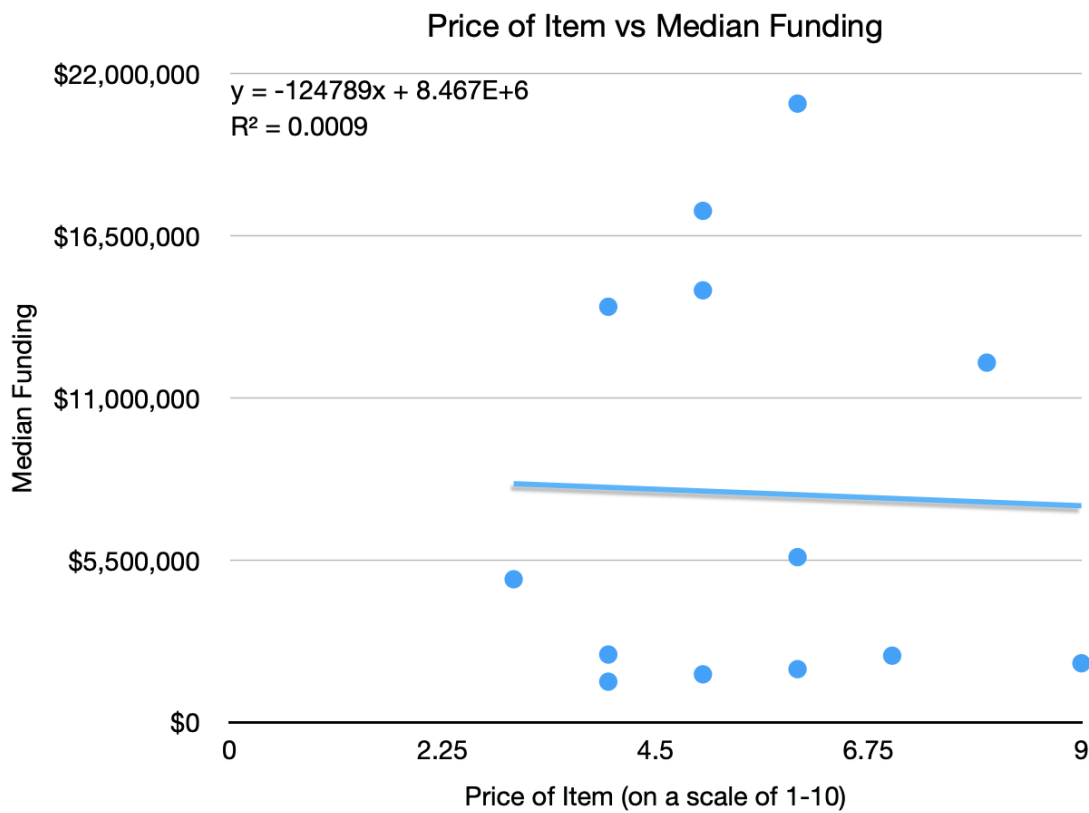
**Experiment #18:** How does the price of an item affect a (P2P) non-rental marketplace startup's odds of success?

**Note:** Experiments #9 was also related to the liquidity of supply, but that was regarding P2P *rental* marketplace startups. This is about P2P *non-rental* marketplace startups.

**Hypothesis:** Unsure

**Reasoning:** Same as in experiment #9

**Experiment Result:**

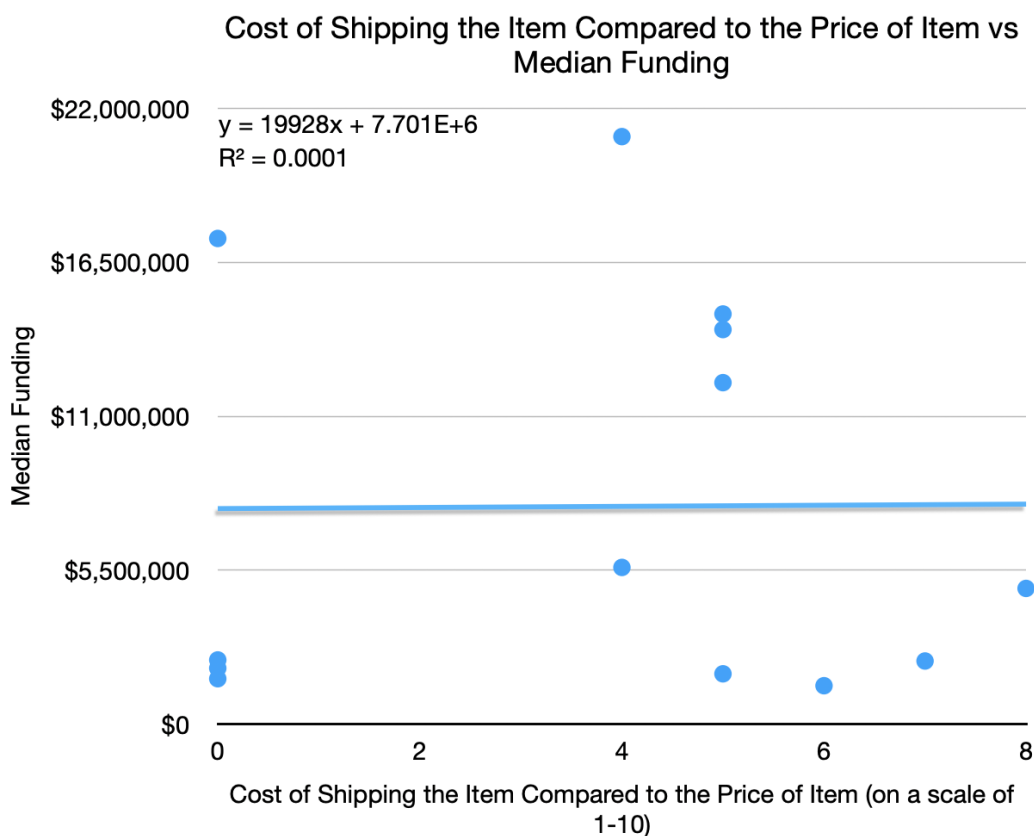


**Experiment #19:** How does the cost of shipping an item compared to the price of the item affect a (P2P) non-rental marketplace startup's odds of success?

**Hypothesis:** The cost of shipping an item compared to the price of the item is inversely correlated with the odds of success.

**Reasoning:** If someone is buying a \$10 used dress from someone else, but the cost of shipping is \$8, then they might as well buy a new dress (it would cost ~\$20).

**Experiment Result:**



**Hypothesis:** Incorrect

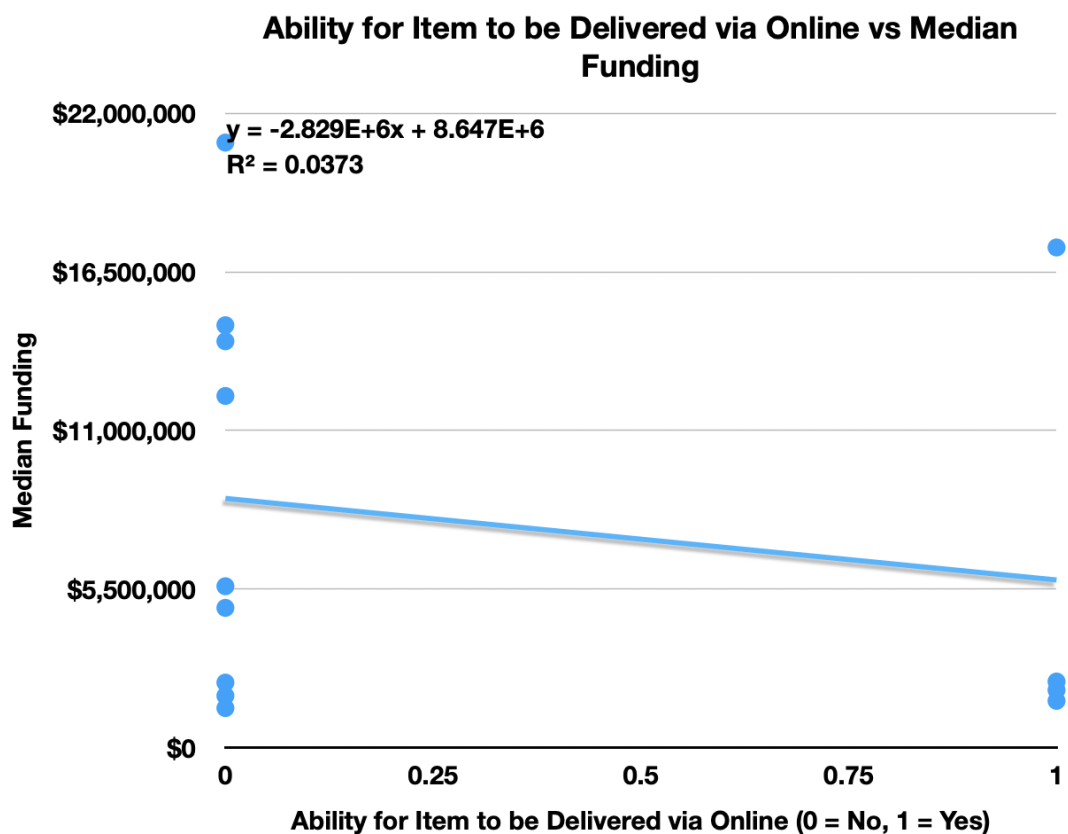
**Experiment #20:** How does the ability for the service to be delivered via online affect a (P2P) non-rental marketplace startup's odds of success?

**Note:** Experiment #5 was also related to the online deliverability of a service, but that was regarding P2P *on-demand* marketplace startups. This is regarding P2P **non-rental** marketplace

**Hypothesis:** Ability to be delivered via online is correlated with odds of success

**Reasoning:** Same as Experiment #5

**Experiment Result:**



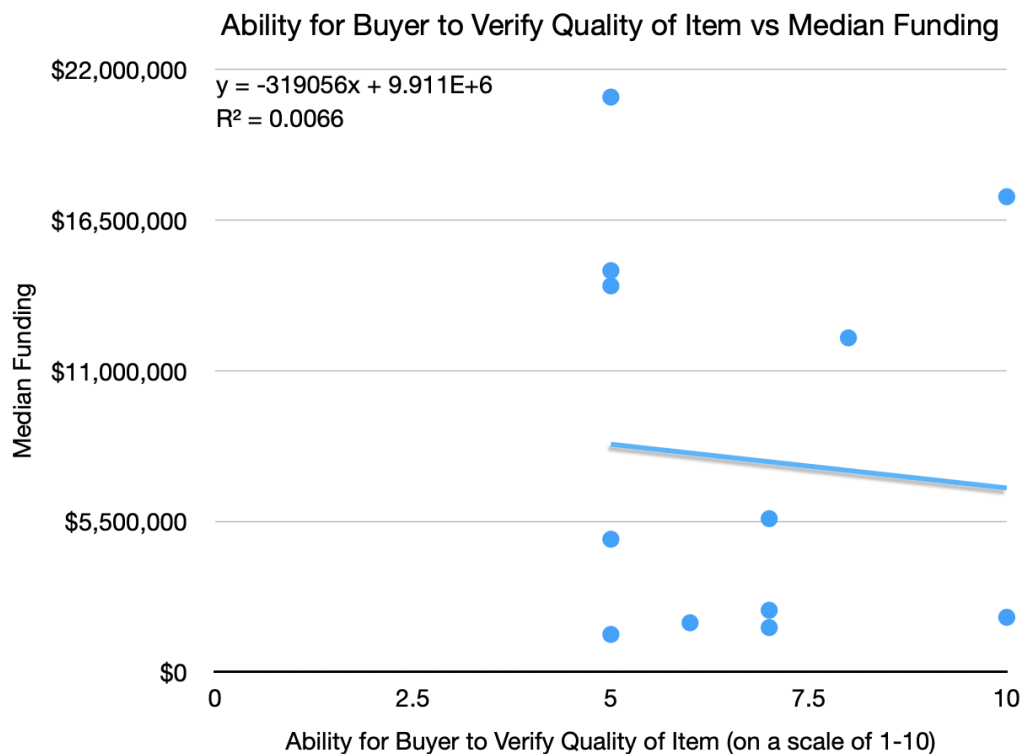
**Hypothesis:** Incorrect

**Experiment #21:** How does the ability for a buyer to verify the quality of an item affect a (P2P) non-rental marketplace startup's odds of success?

**Hypothesis:** The ability to verify is correlated with the odds of success.

**Reasoning:** If someone knows an object is genuine (like if the service authenticates every item), they won't have a problem with a P2P marketplace. Otherwise, trust issues undermine usage.

**Experiment Result:**



**Hypothesis:** Incorrect

## Summary of Results and Significance

As an overview of the data and results provided above, many of the hypotheses proved correct, although most would not count as statistically significant given the low  $R^2$  of the line of best fit. You can view the exact numbers and results in the images provided above. There were a few  $R^2$  above 0.2, although most were close to zero. This is mainly due to the relatively sparse number of companies in each category (many had an  $n < 5$ ). Also, the assigning of numbers from 0-10 for each characteristic was done by me using general mental heuristics. A more rigorous approach could potentially have generated higher  $R^2$  scores.

To view the entire list of 500+ P2P marketplace startups I used to construct the various categories, you can view the spreadsheet here:

<https://airtable.com/invite/l?inviteId=invwnnnlZYnFt6pRm&inviteToken=b9455dc8d09a639bbaaec09097021d38b870fedd365debafb6501c292db13cbe>

By conducting a more thorough analysis of what P2P rental marketplaces are likely to succeed, we can help VCs invest in better companies and thus, more efficiently allocate funding dollars. For example, I interned for IAC's (parent company of Tinder, Vimeo, Angie's List, etc) M&A team in the fall of 2019. IAC is a ~\$20 billion market cap holding company and they almost exclusively only buy marketplace startups. Therefore, reading this paper might be of interest to them given they're putting a significant amount of capital to work.

Also, founders interested in starting a company in this space should also read this paper because it will prevent them from spending years of their life in a startup that was likely

doomed to fail in the first place due to marketplace dynamics that might not be obvious without having conducted academic research. Regulators would find the paper useful because it would allow them to see which verticals are likely to grow the quickest in the sharing economy, so they can be proactive in passing appropriate legislation, not reactive.

The impact of peer-to-peer marketplaces is only increasing and the effects widening, so executives in certain industries might be interested in reading this paper. For example, consumers are increasingly buying Louis Vuitton clothes on second-hand marketplaces like Poshmark. This trend would obviously be of interest to executives at LVMH.

The rise of these marketplaces also has multiple second-derivative effects. For example, when users buy second-hand goods from one another, companies like FedEx and UPS benefit. Macro effects like this could be of interest to long-short equity hedge funds.

Also, since users will be buying fewer new goods and instead, purchasing more second-hand goods via these platforms, I suspect there will be a trend by manufacturers to produce fewer, but higher-quality items.

The platforms mentioned in this paper are also likely to change as technology changes, as well. Technology will change the ability of what can be P2P shared. For example P2P car sharing services like Zipcar can be inconvenient because in less-densely populated areas, there might not be enough available cars in walking distance. However, via self-driving car technology and Tesla's proposed autonomous car sharing fleet, you'll be able to summon a Tesla to your driveway, thus negating the need for cars to be available in walking distance. This feature will likely popularize P2P car sharing. My prediction is that power and capital will shift from the

manufacturers of these goods to software companies who develop the platforms to exchange these goods second-hand: a shift from goods-creators to software-providers.



## Limitations of Research

Because I manually assign ratings to companies according to the characteristics above, there is room for subjectivity. For example, it's hard to give a 0-10 rating for "number of competitors" or "difficulty of the regulatory environment."

Also, there is an element of survivorship bias in the data set I used (Crunchbase), as there would be in any data set in this industry. These aggregator companies generally only add a startup to their list after it is mentioned in the press. This means the sample of companies I'm using is skewed a bit to the more successful side. For example, a startup that tried doing a P2P rental marketplace for skateboards and failed before it could raise capital isn't likely to be in the dataset. Even some categories, like "measure of success" is biased -- for example, using the total amount of funding raised is not the best proxy given VCs tend to invest in white, male founders from top schools overwhelmingly.

Also, for some categories, like "on-demand large-haul truck rental," I only had one startup, the median funding for that category was based on a  $n=1$ . Similarly, other categories only had  $n=3$ . Others, like ridesharing, had much larger  $n$ 's. This is why I only used the middle 50% of categories (sorted lowest to highest by funding) to minimize the effect of outliers, both large and small.

Also, it's hard to compare the successes of startups from different time periods (e.g. mid-2010s vs mid 2000s) because the tools founders often build on top of, like APIs, evolve. For example, before Stripe, Uber might not have succeeded because users wouldn't be able to pay automatically through their phones.

### **Further Research**

It would be interesting if someone did qualitative research as well, by interviewing VCs and founders. Exploring the impact of new technologies like blockchain on P2P marketplaces is fascinating, especially since blockchain is focused on eliminating the “middleman” and decentralizing ownership of a platform.

Also, to avoid survivorship bias in the data, one might try and see if they can find a better source of startups -- one that is based on filings of incorporation, for example, instead of the one I used (which is based on startups that raised VC money).

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