Understanding how Uber & Lyft Grow in Markets

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Bill Gurley popularized the idea of expanding the market in his 2012 blog post "All Markets Are Not Created Equal: 10 Factors To Consider When Evaluating Digital Marketplaces". Number seven on his list is the idea that marketplaces can actually expand the Total Addressable Market size of the industries they operate in (known popularly as TAM Expansion). The idea is that by changing the price point, making it more convenient, or changing other parts of the value proposition of a product, companies could actually grow the industries they were part of. All marketplaces aspire to TAM expansion; few achieve it.

Gurley's 2014 essay "How to Miss By a Mile: An Alternative Look at Uber's Potential Market Size" focused on the idea of TAM expansion as a core part of understanding the potential of marketplaces. Gurley wrote the essay to rebut a critic of Uber, who focused on the TAM of the ridesharing market to explain why Uber's valuation was too high. Gurley brought up a number of ways Uber might expand the ridesharing market.

Was Gurley right about Uber? Has it expanded the market size for taxis? And if so– how? Over the years there have been many arguments about whether Uber was truly growing the taxi market, or just killing the existing industry. It's hard to know what

lessons to draw from Uber and other ridesharing companies—without seeing actual data about their impact.

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Introduction to NYC Taxi and Ride Hailing Data

It's rare that we get to quantitatively examine a case of TAM expansion as there is little publicly available data of examples of it. But thanks to the NYC Taxi and Limousine Commission and 538, we have the data to analyze the effect of ride hailing vehicles on the taxi market. And most of all, thanks to Todd Schneider, who has not only done significant work to clean and organize the data–but also graciously open sourced it all. With this data, we can examine date and pick-up location for all taxi or ride-sharing rides going back the last decade.

Market expansion is a poorly understood area. Some people think that it is rarely real, and startups mostly cannibalize existing markets. While others view it as an ephemeral property of companies that either happens to strike or not for a lucky few. Few have seen hard data on what market expansion looks like, so it's understandable that there is little shared understanding around it.

Looking at NYC data on the taxi and ride-sharing markets we can determine that the taxi market *is* expanding, with the important caveat of outer-borough rides contributing to the bulk of new growth. The data helps show a concrete example of what market expansion looks like—and that it's not a vague attribute of companies—

but specific to the customer segments where the service solves the needs of customers that previously were underserved by the status quo services. Though not part of the scope of this piece, market expansion can be thought of as customer segmentation including segments that previously would not have been customers of the market given the prior levels of service and cost.

Uber and Lyft Expand the Taxi Market

Looking at how many Ubers and Lyfts blanket the streets of most major cities, many would assume that they have expanded the size of the taxi market. They're right.

Here's data on monthly rides in NYC of Taxi AND ride hailing trips combined. See if you can guess when Uber and Lyft started to take off.

Uber and Lyft started to have a real effect starting in 2014. Before then the NYC taxi market was relatively stable—averaging around 14 million rides per month consistently for the half decade leading up to 2014. Since 2014 the number of rides

has begun to expand—and hit 25 million a month at the end of 2017. Gurley was correct that companies like Uber could expand the market, to the surprise of nobody who has walked in NYC or SF.

To understand what is driving this market expansion (in NYC at least), we need to cut the data a level deeper.

TAM Expansion driven by the Outer Boroughs

The most striking cut of this data is comparing Manhattan to the Outer Boroughs. The New York Times has written about the impact of Uber in the outer boroughs. And 538, which deserves much credit for their push to get this data released, has multiple articles analyzing the impact of Uber in Manhattan and the Outer Boroughs.

The data is striking on the different impact of ride hailing apps on Manhattan vs. the Outer Boroughs. Here's the same chart of monthly rides, but colored by trips begin in Manhattan vs those in the Outer Boroughs.

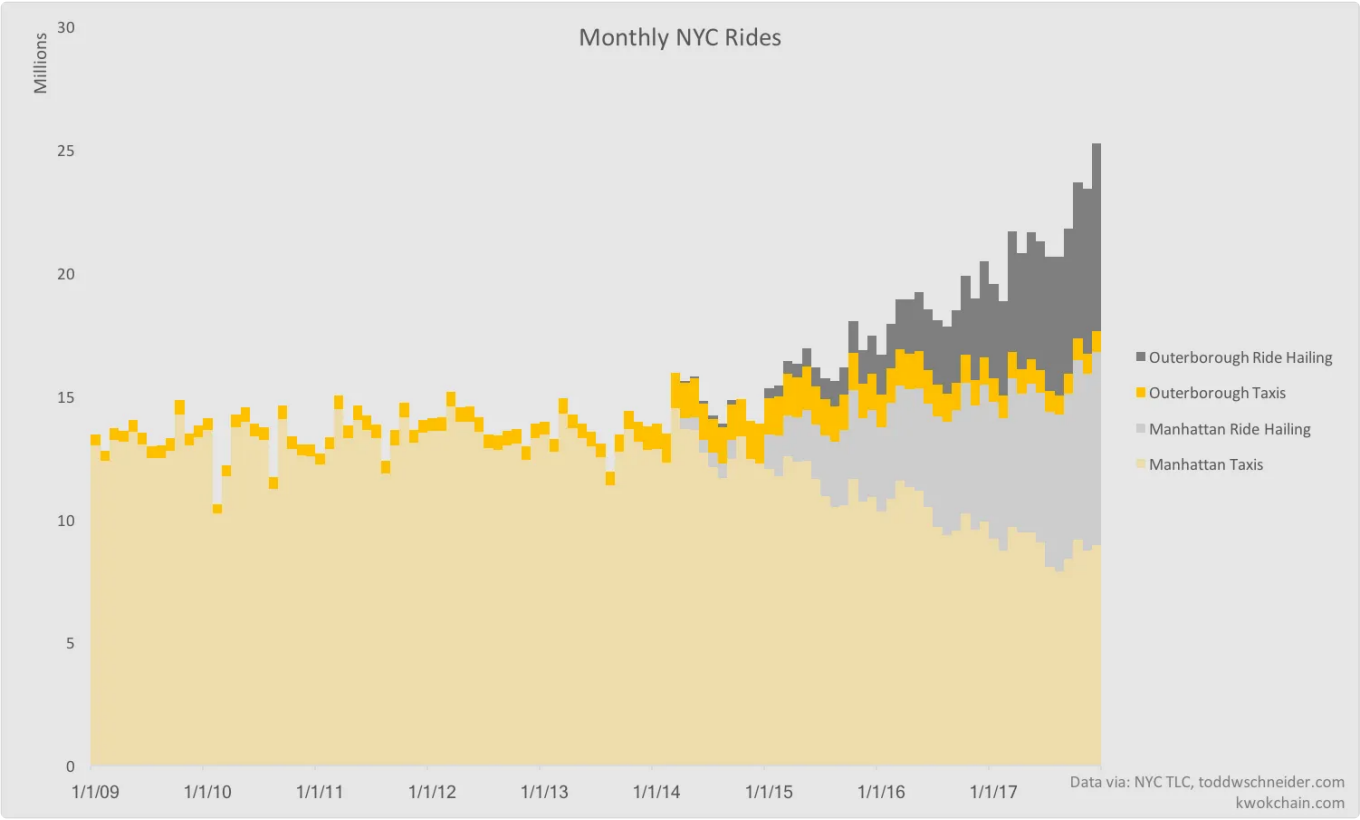
When we talk about Uber and Lyft expanding the taxi market, it's largely a story of the Outer Boroughs. As Uber and Lyft have grown over the last 5 years, the Outer Boroughs have been responsible for most of NYC's increase in rides.

Unmet Latent Demand in the Outer Boroughs

The next step is to cut the same data by Taxi rides versus ride hailing rides. The chart below keeps the separation of Manhattan and the Outer Boroughs but also color codes taxis yellow and ride hailing vehicles gray.

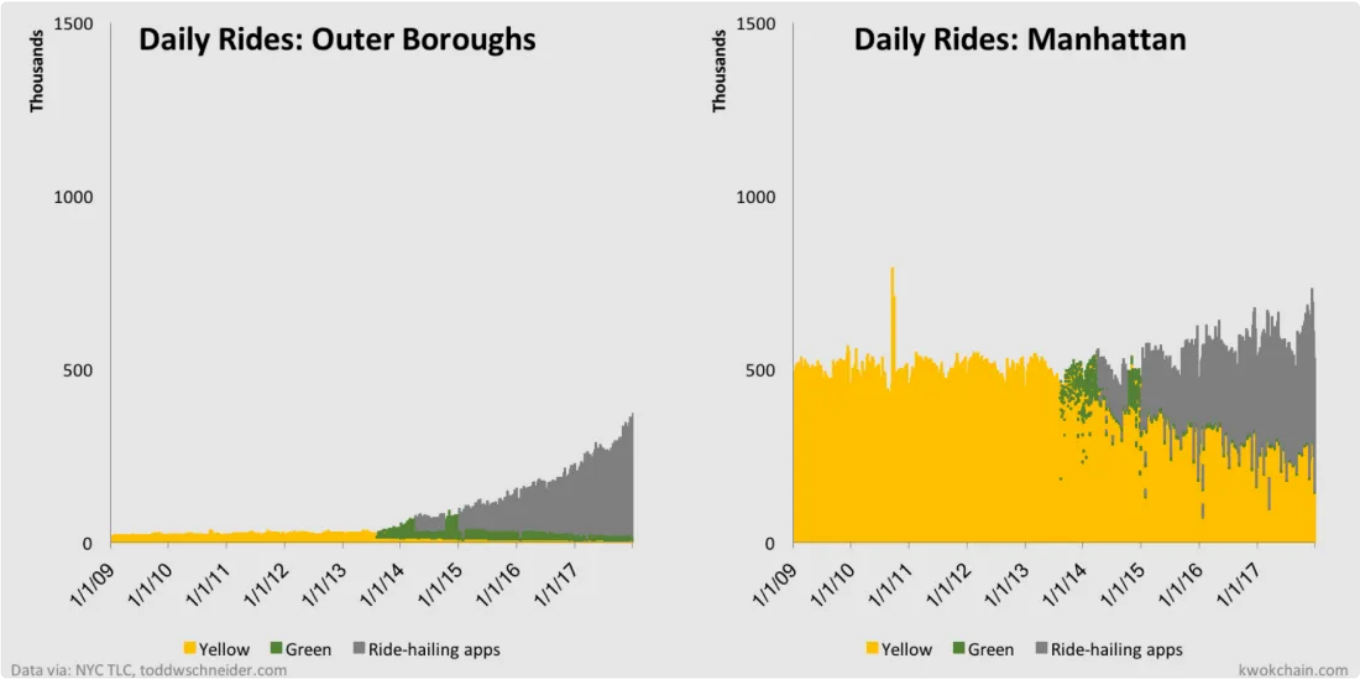
These charts show the larger picture of Uber and Lyft's impact on NYC. In Manhattan alone, Uber and Lyft have been taking real market share from taxis. More recently, they may be starting to expand the market.

It's a different story in the Outer Boroughs. While Yellow taxis are supposed to serve the Outer Boroughs, historically they've avoided them—opting for the high density of Manhattan where it's easier to find rides. Green taxis, which are cheaper and easier medallions to get but are not allowed to serve Manhattan, were specifically introduced to bring more supply of taxis to the outer boroughs. Looking at our data, we can see in retrospect that neither Yellow or Green taxis were able to serve anywhere near the true latent demand for ride sharing services.



Expansion of Taxi Market Shows No Sign of Slowing

Separating Manhattan and the Outer Boroughs into two charts side by side allows us to compare their relative scales and composition. I've done this in the chart below, while also separating out Yellow and Green taxis. Demand for rides in the Outer Boroughs is strong and approaching the daily scale of demand in Manhattan. And it's not slowing down. It may be obvious to us in a few years that the Outer Borough has always had greater demand for ride services, given its lower density and fewer subway connections—and that taxis weren't really meeting that demand. Supply met demand only after the ride-sharing apps came around.



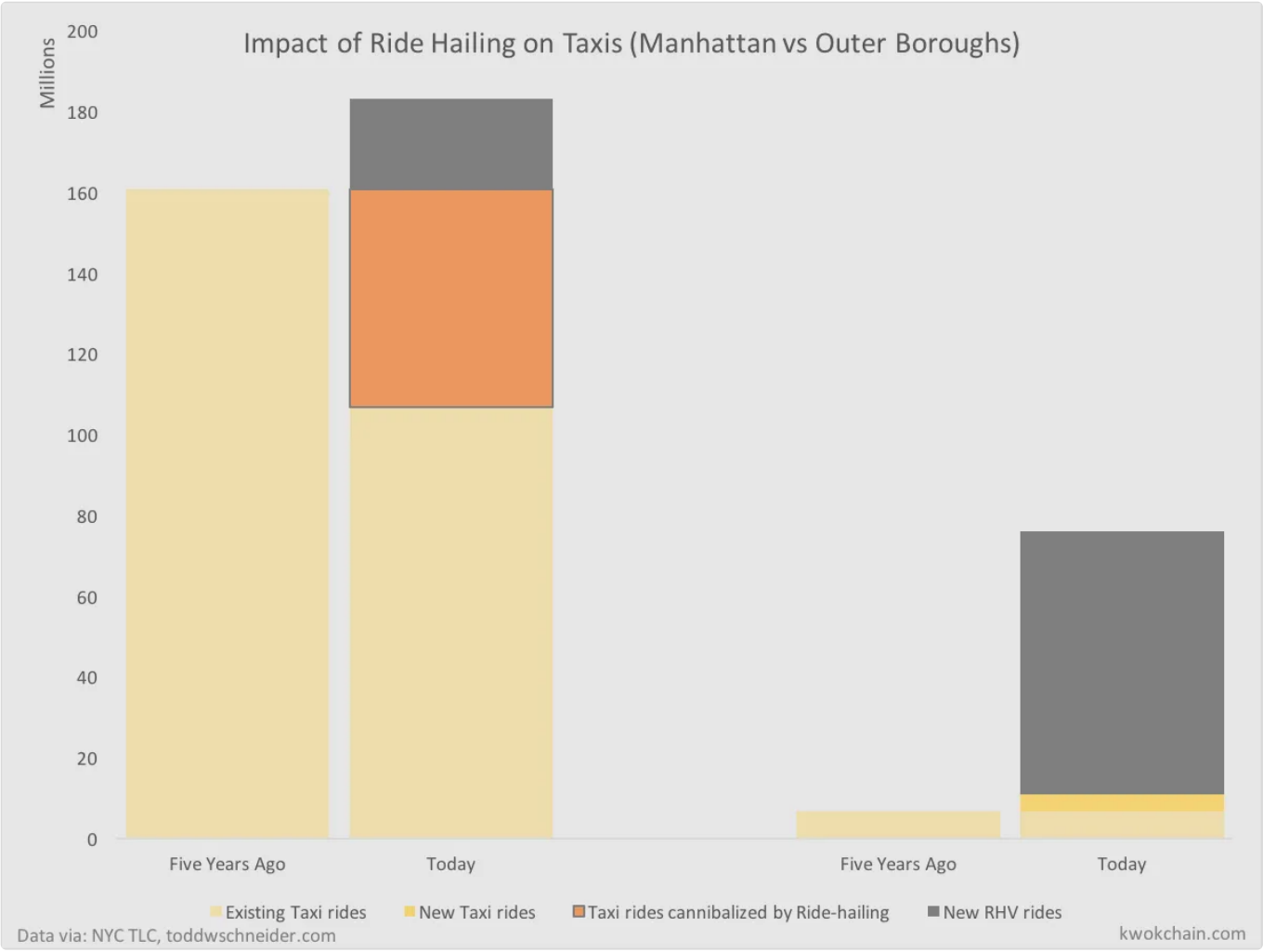
Uber and Lyft Both Grow and Cannibalize Markets

The data now lets us evaluate if Uber and Lyft are expanding the market or replacing the taxi drivers.

We can begin by examining the impact ride-hailing apps have had on the taxi market over the last five years.

Below is a look at rides in 2012 and 2017 (the left is Manhattan and the right is the Outer Boroughs) colored by type of ride. Yellow are taxi rides, gray are ride-hailing rides, and orange are rides that used to be taxi rides but are now ride-hailing rides.

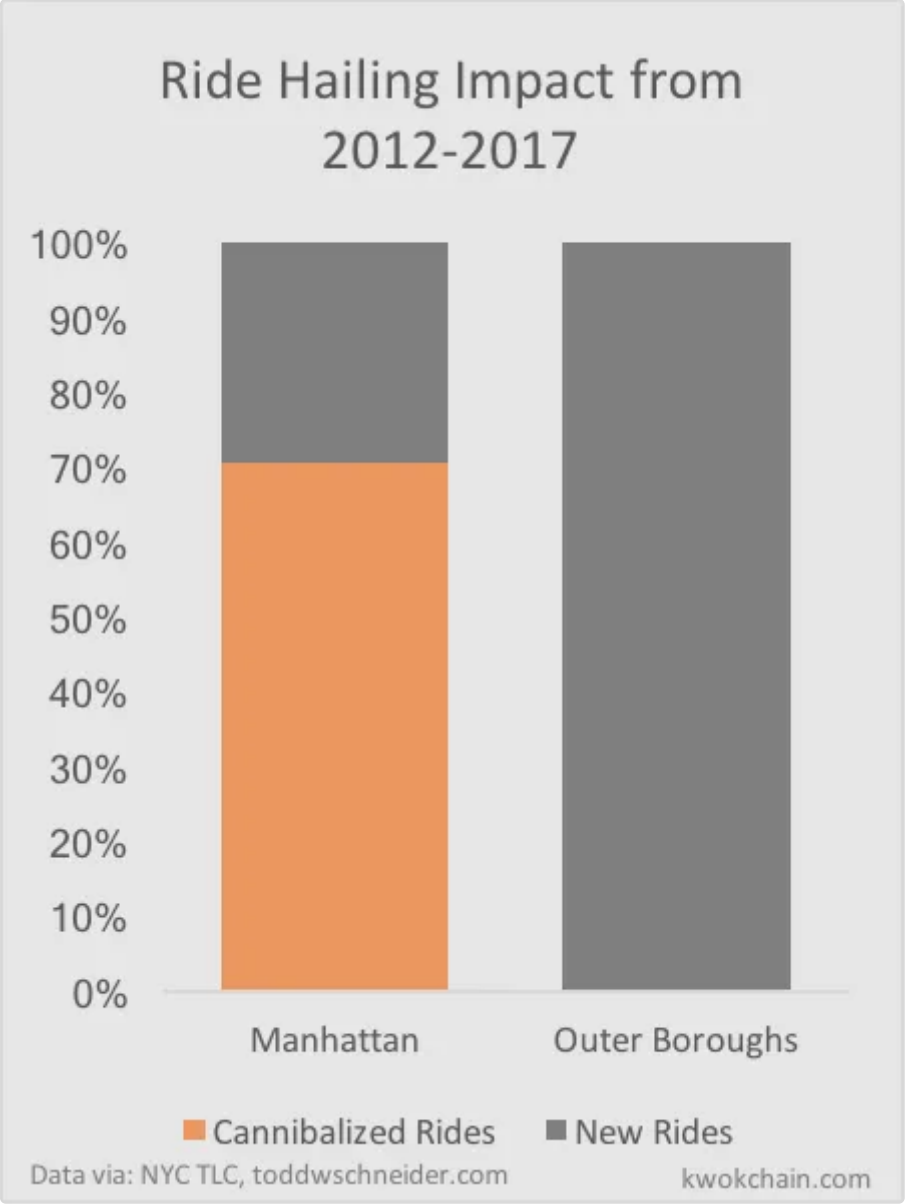
Though not perfect, this data gives a decent proxy for the industry. Over the last five years the Outer Boroughs have unambiguously seen an expansion of the market while the story is more complicated in Manhattan. While Uber, Lyft, and their competitors have expanded the market in Manhattan, they have also replaced many rides that would have otherwise been served by taxis.



With these charts we can look at what percentage of Uber and Lyft rides are net new rides as opposed to rides that might have been previously handled by taxis.

In Manhattan, around 70% of rides on ride-hailing platforms would likely have otherwise been served by taxis. While in the Outer Boroughs almost all rides are net additive.

Proponents and detractors of Uber and Lyft are both right. These companies both cannibalize AND expand the market. But the degree to which they do varies significantly along geography, density, and other factors. It should be noted that NYC is likely the city with the most robust pre-existing taxi market in the US. While we don't have that data, it's reasonable to expect data from other cities to look more like the Outer Boroughs than Manhattan. In general, ride hailing apps are likely to have cannibalized the market in a few dense cities in the US; and in the overwhelmingly non-dense parts of the US, they've expanded the market.



Final Thoughts

In his rebuttal to Aswath Damodaran, the top potential new use case Gurley suggested Uber had was:

> *1. Use in less urban areas. Because of the magical ordering system and the ability to efficiently organize a distributed set of drivers, Uber can operate effectively in markets where it simply didn't make sense to have a dense supply of taxis. If you live in a suburban community, there is little chance you could walk out your door and hail a cab. And if you call one of the phones, it is a very spotty proposition. Today, Uber already works dramatically well in many suburban areas outside of San Francisco with pick up times in less than 10 minutes. This creates new use cases versus a historical model.*

Gurley was right. The data shows that ride hailing apps have improved their improved promptness, reliability, and service-level of taxis while increasing coverage. And that has allowed the overall taxi market to significantly expand in less dense areas, like the Outer Boroughs. It's a demonstration that tech companies can use technology to find new levels of service while coherently handling increased scale of liquidity, unlocking discontinuous improvements of the customer experience.

Uber and Lyft realized two important things:

1. Mobile technology has made it possible to automate dispatching for all drivers more efficiently than possible before—leading to a centralization of dispatch.
2. Mapping software like Google Maps and Waze can embed expert local knowledge into the phone, allowing anyone to become a driver.

These developments gave them the pricing power, SLA, and thick supply to meet the needs of consumers in the Outer Boroughs, which were not well served previously.

Uber and Lyft understand the importance of segmenting markets. They were among the first marketplaces to understand that they should treat different cities differently —even staffing local teams in each city to better address issues best solved locally. Many of the economies of scale and network effects in the ridesharing business exist within cities—but not between cities. Similarly, the data shows that there are important differences between urban cores and less dense areas even within the same city.

Useful segmentations in companies aren't just limited to geography. For example, many of Pinterest's metrics can be segmented by the different topics that pins are about. Choosing the right ways to segment a company's business to best understand the business and which areas are related and affect each other is key to figuring out how well a company is performing—and what areas are compounding.

Credits

I want to give a serious shout out to Todd Schneider's blog. The data used in my charts come from his painstaking work to not only pull, organize, and analyze the

data—but also his gracious open sourcing of it all. I highly recommend reading his analysis, which covers a broad set of fields, and his blog in general. Todd posts infrequently, his essays are gold, and he always presents fascinating data.

Also want to thank Michael Dempsey, Saam Motamedi, Arjun Narayan, Dennis Tang, Dan Wang, and Eugene Wei for their help with this post.

Post-scripts

[1] More rigor around the understanding and quantification of the probability and potential of TAM expansion for different marketplaces is an important area of work. There's interesting debates to be have on this subject–and subject for future discussions.

[2] Astute observers will point out that TAM (and TAM expansion) only exist relative to how one segments the market. There is no such thing as a free lunch. Or rather, there is a free lunch—as long as it's someone else's. For example, while Uber and Lyft appear to be growing the market for taxi rides in the Outer Boroughs. It is very likely that if you looked at the broader Transit market (including both taxis and public transit) that much of Uber and Lyft's growth has replaced rides that might have otherwise been on bus or subways. MTA data suggests this is true. TAM expansion is often the cannibalization of substitute markets. Further work is needed to understand what share of Uber's rides comes from taxis, public transit, or are net new rides.

[3] TAM expansion is key in marketplaces, beyond being a source of unexpected good fortune. Marketplaces typically improve the efficiency and liquidity of a market. However, improving the efficiency of a market naturally shrinks its size—so without an expansion of the market, marketplaces typically decrease the original market size. However, by unconstraining their markets and making possible new levels of service and cost, they may induce new use cases or market segments that were not possible or feasible before—expanding the market.

[4] Hopefully this piece is a small illustration of the benefits of looking at various cuts at one's data to understand what are the distinct segments and core loops that are really driving aggregate performance. While practitioners at startups and some at venture firms are able to look at real data, there is little real data available to the

public. Would love to see more data shared publicly—we collectively advance in our understanding of marketplaces and network effects most when learnings are distributed publicly.

Tagged: marketplaces

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