
Going to Pieces: Valuing Users, Subscribers and Customers

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Abstract

In conventional valuation, we usually value businesses as aggregated entities, estimating total revenues, earnings and cashflows, across the different businesses and customers that the company has, and then discounting those cash flows back at a discount rate that reflects the weighted risk across the entire company. The reasons for doing so are two-fold. First, the information that we are provided in financial statements, as investors, is often on the aggregated company and not on its constituent parts. Second, again as investors, we are ultimately investing in entire companies, not in their disaggregated units or customers. However, businesses are not only increasingly marketing themselves to investors on the numbers of users, customers and subscribers that they have, but they are also building their business models around these constituent parts. While many of them contend that conventional valuation approaches don't work in this new world order, we disagree. This paper attempts to extend intrinsic value and pricing approaches to value a user, subscriber or member, using Uber, Amazon Prime, Spotify and Netflix as examples. In the process, we lay bare some of the holes in information disclosure and examine the dynamics that drive the value of users and subscribers.

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In conventional business valuation, we value the aggregated company, discounting its collective cash flows, across businesses and customers, at a company-wide cost of capital. That is often the appropriate way to approach valuation, but there are cases where you may want to value a company by valuing it in pieces, by either valuing each business and geographic grouping separately, or by valuing its units (customers, users) and then aggregating. While valuation first principles do not change, the information that we need, and the mistakes that we have to avoid, change with disaggregated valuation. In this chapter, we will begin by contrasting aggregated to disaggregated valuation and follow up by looking at how to value user or subscriber based companies, by valuing individual users or subscribers.

Aggregation versus Disaggregation

One of the features of discounted cash flow valuation is that it is additive. In other words, if you have to value a company in three businesses, you can either value the combined company, by adding up its cash flows across the three businesses and discounting at a discount rate that is a value-weighted average across the business, or you can value each of the three businesses, using the cash flows and discount rate of that business in the valuation, and add up those values. In theory, at least, you should get the same value for the company doing either. We will term the former **aggregated valuation** and the latter **disaggregated valuation** and explore the differences.

There are two reasons why aggregated valuation has been the historically dominant approach.

- As investors, we invest in entire companies, not in their disaggregated parts. Thus, you buy shares in General Electric (GE), the company and not in GE Aircraft Engines or GE Capital, and in Coca Cola, the global company, and not in Coca Cola's Indian operations. That is perhaps why so much of valuation is built around aggregation, where you look at the revenues and cash flows of the company, across geographies and businesses, and discount them back at discount rates that reflect the weightings of these businesses and geographies.
- There is another reason why aggregated valuation is the rule, rather than the exception. Most information disclosure is on an aggregated basis, with companies such as GE and Coca Cola's reporting full financial statements (income statements, balance sheets and statement of cash flows) for their respective enterprises. While there has been some attempt to improve disclosure at the business segment and geographic region level, that information has usually been consigned to footnotes and remains spotty, with disclosure practices varying across companies and countries.

There are occasions, though, where you may want to value a company by valuing its parts separately.

1. **Fundamental Differences:** With multi-business companies and multinationals, one advantage of valuing each business or geographic segment separately is

- that you can then assign different risk, cash flow and growth profiles to each one rather than trying to create one weighted profile for the whole company.
2. **Growth Differences:** If some businesses and geographic segments are growing much more quickly than others within the same company, it becomes difficult to do an aggregated valuation that reflects these different growth rates. For instance, a bottom up beta that represents a weighted average of the businesses that a company is in, will have to change over time, if some businesses grow more than others.
 3. **Transactional Reasons:** In some cases, you will need to value a portion of a company, rather than an entire company, because that portion will be sold or spun off and requires a value specific to it. This need becomes acute when you are valuing a company that is on the verge of being broken up into parts.
 4. **Management Reasons:** Within a company, it makes sense to value each part of the business separately, both to monitor the performance of different divisional managers but also to improve that performance.

The process of valuing a company by valuing it in pieces and then adding up the values of these pieces is called sum-of-the-parts valuation, and while it is often mangled in practice and sum-of-the-parts pricing is more common, it has been in use for decades. We looked at the process in detail in a paper on valuing multi-business, multi-national companies, using United Technologies as an illustrative example.¹

In the last decade, as social media companies like Facebook and Twitter have entered markets, there has also been an increasing focus on what the value of a user is in these companies, partly because they derive their value from having a multitude of users, but also to tailor decisions to maximize that value. With this sub-group of companies, it can be argued that the disaggregated unit is the user or subscriber, and that to value these companies, you need to first value a user or a subscriber. It is in pursuit of this mission that the rest of this paper will be structured.

User/Subscriber/Customer Companies

In the last decade, we seem to have shifted into an age when companies measure their success based upon the number of subscribers, customers and users that they have, rather than on the traditional metrics of total revenues and cash flows. While we remain committed to the notion that value ultimately comes from cash flows, the way we build up to those cash flows, for companies like Uber, Facebook and Netflix is often through their users or subscribers. In pricing, the shift has been even starker, with many investors pricing social media companies on the number of users that they have, rather than as multiples of total revenues and earnings. In this section, we will look at the dark side of this shift, in terms of valuation and pricing practices, and perhaps provide a better way of thinking about how best to value and price users or subscribers.

¹ Damodaran, A., 2009, The Octpus: Valuing Multi-business, Multi-national Companies, Working Paper, SSRN.com.

The Rise of the User/Subscriber Model

There is no company that captures the shift in focus in business better than Facebook. Its meteoric rise in value can be traced best to its mammoth user base, with more than 2 billion users by the end of 2017. The large size of Facebook's user base, and the detailed nature of Facebook's data on who they are and what their preferences may be, have attracted advertisers willing to pay to expose those users to targeted advertising. This has translated into an online advertising revenue stream that grows at hefty rates in each period, with a high operating margin (in excess of 50% in 2017). There are other social media companies, younger and less tested than Facebook, that offer only one half of the equation- lots of users, but little or no revenues and earnings to back up these users. This is the case, for instance, with Twitter and Snap, though both companies would RGUE that it is only a matter of time before both are delivered.

It is not just the social media companies that build their value up from users. Netflix, another company whose market value has soared, often emphasizes the growth in its subscriber base more than it talks about revenues or profits in each earnings report. More than a hundred million people subscribed to the service at the end of 2017. Companies that used to build their valuations around conventional business metrics seem to have noticed the market's liking for unit growth. Amazon has invested heavily in Amazon Prime, its subscription membership model with 100 million subscribers at the end of 2017, and seems to be using it as a wedge to create more growth and value in its retail and entertainment businesses. Microsoft and Adobe, which used to be conventional software companies that built growth around selling upgrades to existing software, have adopted subscription models, Office 365 for Microsoft and Creative Cloud for Adobe.

If you are an investor or analyst looking at these companies, you have three choices. One is to stick with the conventional aggregated models and to try and capture the benefits of users and subscribers in revenue growth and operating margin, and the cost of acquiring these users in reinvestment. The other is to estimate the value of a user or subscriber, using intrinsic value first principles or standard pricing practices, and then aggregating up to the value of a company. In my view, there are benefits to both, and since there is no reason that using one approach precludes you from using the other, it perhaps makes sense to do both. The third is to split the difference, staying with the conventional approach of forecasting aggregating numbers, but tying those forecasts more explicitly to user numbers that reflect the economics of the business, including the cost of acquiring users and the expected user value.

Valuation Issues

Given the characteristics of user/subscriber based companies, you could start constructing valuation models that try to incorporate these characteristics. The issues, though, that bedevil user-based valuation are often not theoretical but are related to information disclosure and accounting practices.

- Information disclosure (or non-disclosure): As you will see in the next few sections, there is no magic to valuing a user. In fact, conventional valuation

models can be easily adapted to estimate the value of a user to Facebook, a rider for Uber and a subscriber in Netflix. That said, the information needed to value these units is often either held back or opaquely provided by companies. It is ironic that companies that are quick to tout the number of users they have and ask to be priced on that number are unwilling to share information about those users that investors need to better judge their value or price. The accounting rule writers may want to consider what investors need to better assess unit value, when they write rules specifically for user or subscription based companies. . Until this occurs, the data on many companies' customer bases has to be obtained second-hand, from business intelligence firms such as Second Measure (<https://secondmeasure.com/>), which mine customer data sets (e.g., large credit card panels) to generate insights into customer behavior.

- **Accounting inconsistencies:** Coupled with the information non-disclosure is another problem that we highlighted for companies with intangible assets. Just as accountants take the biggest capital expenditures (R&D) made by technology and pharmaceutical firms and treat them as an operating expenses, the biggest investment for future growth made at user-based and subscription-based companies is the money spent in acquiring new users and subscribers and that expenditure is routinely expensed. As with pharmaceutical companies, you can then argue that the income at user-based companies is understated and that the biggest assets that these companies have is not on their books. In fact, we will argue that the problem is more difficult to solve at these companies than it was at technology and pharmaceutical companies, because unlike R&D, which is separately reported as an operating expense, and thus can be recategorized as a capital expense, the costs of acquiring new users is hidden in SG&A expenses and often very difficult (if not impossible) to separate.
- **User Diversity:** Not all users and subscribers are of equal value. Thus, while the average subscription revenue is roughly the same for Netflix, which charges similar prices across the globe, the value of a user can vary widely across geographies and within the same market, at other companies. For instance, we will be valuing a user or rider at Uber in the next section, but some Uber users use far more of its service than others and thus should be valued more highly. In fact, one proxy for risk in a user model may be the disparity in values across users, since a company that derives 90% of its value from 10% of its users is built on a more risky base than a company that has a more uniform value distribution. Here again, companies have not been forthcoming in providing more information on differences across users, choosing instead to report total user numbers and average usage statistics.

As you can see, it is not just analysts and valuation practice that has not caught up with the shift to users and subscribers at some companies, but also accounting rules and information disclosure laws.

First Steps

Some financial analysts have tentatively stepped up their efforts to value and price users at companies like Facebook, Netflix and even Amazon, but often for the wrong reasons. Unable to arrive at intrinsic valuations that would justify investing in these companies at their current lofty market capitalizations, these analysts have looked for alternative ways to be able to make these “sells” into “buys”. As a consequence, the process has been biased and the practices that emerge from it are flawed. At the same time, some marketing researchers and consultants, recognizing the opening that the focus on users and subscribers is giving them, have come up with their own variants on not only how best to value users, subscribers and members, but also how to augment that value.

Intrinsic Valuation

Can you modify intrinsic value models to value a user? The answer is yes and some analysts have jumped on to the bandwagon early. In the process, though, they seem to forget some first principles that they would have heeded in conventional valuations.

1. **User immortality:** The value of a user is the present value of the cash flows that you will generate from that user over his or her lifetime with your company. To estimate that lifetime, you need to know customer renewal rates, and since many companies don't reveal this information, there are some analysts who value users on the assumption that they will stay users for the rest of their lives, or worse, for eternity. That will overstate the value of a user.
2. **Revenues as cash flows:** The one number that analysts often can estimate easily is the revenue per user or subscriber, at least on an average basis. In subscription based models like Netflix, it comes from observing the price charged each subscriber, and in user-based models like Uber, it can be derived by dividing total revenues by the number of users. It is much more difficult at either of these companies to estimate how much was spent on servicing existing users. Consequently, many user-based valuations consider revenues as cash flows, acting as if there are no costs associated with servicing existing users and also that there are no taxes that would have to be paid on the resulting income. You can value a Netflix subscriber on the assumption that the annual subscription revenue of about \$120/subscriber, in 2017, is the cash flow for the year but that will over value a subscriber.
3. **New user magic:** The value of a user-based company is the sum of the value of its existing users plus the value of any new users it will acquire over time. That said, the value of a new user will be less than that of an existing user, for a simple reason: it costs money to acquire new users. Here again, the absence of concrete information about user acquisition costs or new users acquired leads some to ignore the costs all together and give new users the same value as existing users, resulting in inflated values for companies that spend considerable amounts to acquire these new users. Just as conventional companies can grow and destroy value by spending too much for that growth,

- user-based companies can add new users and destroy value in the process, by spending too much on acquiring these new users.
4. **Corporate cost vacuums:** Once you have valued existing and new users and aggregated them, you have an extensive amount of mopping up to do, since user-based companies often have substantial costs that cannot be directly traced or charged to users. Again, the absence of information on these costs leads some to ignore them when valuing companies, with predictable results (over valuation).
 5. **Competitive dynamics:** We may have shifted from valuing companies to valuing users, but that does not mean that we can suspend the laws of economics and business. A user-based company that faces intense competition, because it does not have significant barriers to entry, will struggle to create value, no matter how many users it adds, because the competition will keep a lid on its pricing power (and profit margins). One of the perils of user-based valuation is that analysts sometimes get dazzled by the numbers (of users) and do not probe deeply enough into whether these users are exclusive or shared (Uber users can also be Lyft users) and how more conventional competitors for the user business can keep pricing power in check (taxi cabs and mass transit still compete in the car service business). Another is that the early adopters of a servicer (first users) can have very different characteristics, in terms of loyalty and use, than later users, making it dangerous to extrapolate from current user data.

It is true that the process of valuing users and subscribers is still in its infancy and that we will have to make mistakes before how we learn to do it better. That said, though, we should remember that just because we reframe the way we think about companies, we cannot abandon the rules that we used in conventional valuation. Growth is not free, risk reduces value and scaling up is hard to do.

Pricing

If the intrinsic valuation of users is crudely practiced, at least at the moment, the pricing of users is even cruder, but even more widespread. In the last decade, as user-based companies have been formed and capitalized, investors in these start-ups have faced a fundamental pricing problem. Early in their life cycles, these companies are not only money losing, but they do not have revenues of any substance, or physical assets. Thus, you cannot use earnings multiples, book value multiples or even revenue multiples to assess these companies. Venture capitalists who are asked to invest in these companies therefore need a pricing metric or risk being shut out of the game. It should come as no surprise then that many of them have latched on to the only number of magnitude at these companies, which is the number of users or subscribers, as the basis for pricing.

In practical terms, this focus on users translates into a price per user, where the “price” of the company (the investor assessment of what it is worth) is divided by the number of users that the company is expected to have. If that price is low, the company is considered cheap and if it is high, it is expensive. Sensible venture capitalists recognize the danger in this approach, since it assumes that all users are

created equal, when in reality, the value per user should vary depending upon the user loyalty, user intensity and the revenue model of the company. They follow up by probing the company for information that will allow them to make judgments on these user characteristics, before making a final determination. Even among venture capitalists, though, there are some who abandon their responsibility for checking for user value and price companies based upon just usage numbers.

When these companies go public early in their life cycle, the problems get worse for two reasons. The first is that public market investors in the company do not have the capacity to extract information about users from the company that the venture capitalists did and thus are flying blind, when it comes to assessing user value. The second is that the added liquidity in the market place makes this a pricing game, where even savvy investors think that they can use crude measures like price per user to decide when to buy a stock, notwithstanding the limits of the metric, because they plan to sell (hopefully at a higher price) and move on, before its limitations become obvious.

Marketing Research

The shift in focus to users, subscribers and customers has been welcomed by marketing researchers, who have long argued that not enough attention has been paid, in either academia or practice, to the value of a customer, user or subscriber. To be frank, much of the marketing research on customer value has been too focused on customers and too little on value, yielding incomplete and counter intuitive conclusions on value. Much of it is also too abstract, requiring inputs about customer or user characteristics that are unobservable, yielding models that can look good on paper, but cannot be applied on real companies in real time.

There are exceptions, though. Gupta, Lehmann and Stuart were among the first to consider valuing publicly traded companies from the bottom up, by valuing their individual subscribers and customers.² While they made assumptions about constant retention ratios over time, cost allocations and capital structure that may have skewed their valuations, their framework provides a good starting point for thinking about the drivers of customer value.

Daniel McCarthy and Peter Fader have examined the dynamics of user and customer value in a series of papers, starting with subscription-based companies and then extending more generally into customer-based companies. In their initial paper, they started with intrinsic value first principles, i.e., that the value of an asset is the present value of its expected cash flows and proceeded to develop a framework for valuing individual subscribers based upon revenues per subscriber, customer lifetime and cash flows.³ In the process, they isolated the importance of churn rates, i.e., the rates of renewal among subscribers and customer acquisition costs. McCarthy used the

² Gupta, Sunil., Donald R. Lehmann, and Jennifer Ames Stuart (2004), *Valuing Customers*, Journal of Marketing Research, 41 (February), 7–18.

³ McCarthy, Daniel, Fader, Peter, and Bruce Hardie (2017), *Valuing Subscription-Based Businesses Using Publicly Disclosed Customer Data*. Journal of Marketing, 81(1), 17-35.

framework to make a prescient judgment about Blue Apron, where using information from public disclosures, he concluded that about 70% of its customers were leaving after six months, and that the market was over pricing the company. In a subsequent extension, McCarthy and Fader extend their approach to customer-based companies and use it to value Overstock and Wayfair.⁴

Valuing Users, Members and Subscribers

To value or price a user correctly, you must start with a framework for valuation or pricing that reflects first principles. As we try to do that in this section, you will notice that we will use information about users in the framework that is not currently public information. While that may strike you as impractical, we believe that tagging the information you need to value a user is the first step towards better information disclosure at these companies.

Intrinsic Valuation

At the risk of repeating a fundamental truth for the hundredth time, the intrinsic value of an asset is a function of its expected cashflows, the expected growth in these cash flows and the risk in these cash flows. In the next three sections, we will use this principle to develop a framework for valuing both existing and new users. Specifically, we will build up to value of a user-based company in three steps. We will first value an existing user, and use that to value all existing users. We will then estimate the value added by a new user, by netting out the cost of adding a new user, and in conjunction with estimates of the number of new users added in future periods, value all new user. We will put closure to the process by then attaching a value to corporate drag, i.e., those expenses that are indispensable to business existence but unrelated to users and netting that value out of the user value.

Value of a user-based company = Value of Existing Users + Value of New Users – Value of Corporate Drag

The reason that we separate out new users from existing users is to allow for a cleaner analysis of acquisition costs and whether they are paying off, not in terms of just additional users, but in terms of value created.

The Value of Existing Users

If you are a user/subscriber based company with an existing user (or subscriber), that user/subscriber has value to you because you expect to generate cash flows from his or her interactions with you. There are, broadly speaking, three ways (or revenue models) in which you can generate these cash flows:

- **Subscription fees:** The user or subscriber pays a fee, usually fixed, each period for using your service. That fee can be the same for every subscriber or tiered, with different fees for different levels of service, and generally will

⁴ McCarthy, Daniel; Fader, Peter (2018). *Customer-Based Corporate Valuation for Publicly Traded Non-Contractual Firms*. Forthcoming at Journal of Marketing Research.

continue until the subscriber cancels the service. Netflix, Microsoft's Office 365 and Adobe's Creative Cloud are all subscription fee based models.

- **Advertising:** With this model, users pay nothing for being on your service, but other businesses are attracted by your user base (its size and focus) to try to sell them products and services. Facebook, Twitter, Snap and Google are all user-based companies that generate their revenues from selling access to their user bases to other companies in the form of advertising.
- **Transactions:** With a transaction based model, the user or subscriber transacts with or through you, and you generate profits from the transaction. Uber, for instance, allows the download of its app for free but it generates revenues only when you use the app to call for a car service or delivery, sharing in the revenue from that transaction.

As you can see, there are hybrid versions that draw on more than one of these models. LinkedIn has both a subscription based premium model, for users who want to use its network more extensively, as well as a free model, where it generates revenues from online advertising. Amazon Prime has an annual subscription fee that it charges members, but also generates revenues (and associated costs) when Prime members buy products on the Amazon portal.

Whatever revenue model you use, the value of a user or a subscriber is the present value of the expected after-tax cash flows that you will generate from that user/subscriber over the period that you expect them to stay on your platform. To derive this value, you will need the following information:

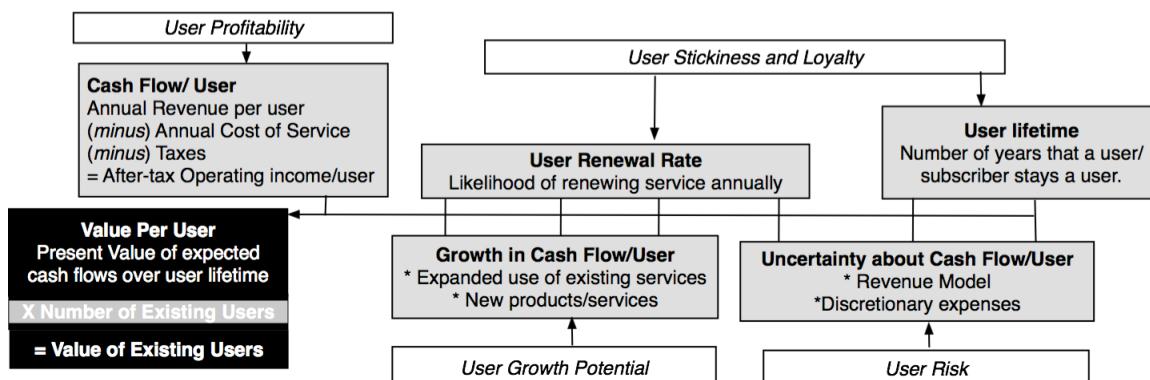
1. **User life:** Whether your users are individuals or businesses, the lifetime of that user to you will be finite, due to mortality. In most cases, though, you will use a lifetime much shorter than the remaining life of a user, because your technology may have a more limited life and/or users' preferences for a brand may change over time. Generally speaking, the more tied your product or service is to a specific technology, the shorter the user life will be.
2. **User renewal rate:** If your users renew 100% of the time, every user will stay on for his or her full lifetime, and you can count on the cash flows each year for that period. If the renewal rate is less than 100%, the expected cash flows in future years have to reflect the survival likelihood for that customer. For instance, if you have an annual renewal rate of 90%, the probability that a customer will be around in year 8 of a fifteen-year lifetime is only 43% ($\text{survival rate until year } 10 = .9^8 = 0.43$). In fact, if you have data that is rich enough, you could estimate year-specific renewal rates for the collective customer base, since it is not just possible but also likely that renewal rates will change as you go through time, usually from lower values in the early years to higher ones in the later years. It is also worth noting that renewal rates, even when reported by companies, can be difficult to generalize, since some subscribers can cancel their subscriptions and renew them multiple times during a period. Finally, the importance of renewal rates in value is far greater for subscription-based companies, where non-renewal leads to a loss of income, than it is for transaction-based companies, where you get value

from a user, only if a transaction occurs. If users and members stop transacting or transact with lower frequency, it should show up as lower user revenues and cash flow. Thus, the renewal rate assumption will have far more consequence in our valuation of Netflix than in the valuation of Uber, with Amazon Prime falling somewhere in the middle.

3. **User cash flow (current):** Your current cash flow per user is not just the revenue that you expect to generate from that user- you must net out against the cost of servicing that user. Thus, if Netflix generates \$120/subscriber per year and spends \$30 providing direct services to that subscriber, the base year cash flow for Netflix will be \$90 per subscriber, on a pre-tax basis, and perhaps only \$72 per subscriber, if it faces an effective tax rate of 20%. With an advertising-based company, this is a more diffuse number to estimate but dividing your total advertising revenue in the most recent period by the number of users you had during the period may be a reasonable starting point for revenues, but you will still need to net out costs
 4. **Growth in per-user cash flow:** Once you have acquired a user, you may be able to sell that user other products and services in the future, leading to growth in the per-user revenues, and if some of your service costs are fixed, your operating profits per user will grow even more quickly. That growth, though, will depend on your business model. For Netflix, with its monthly subscription based model, there are limits to how much it can raise that subscription price over time. For Amazon Prime, there is a much larger potential for growth, since a Prime member can be targeted with new products and services. One outgrowth from Amazon's acquisition of Whole Foods in 2017, for instance, is that the company can offer prepared meals to its Prime members as an added product.
 5. **Risk in Cash Flow:** Since the risk of losing a user is already built into the expected cash flow, the primary risk here comes from both variations in renewal rates over time and from how much cash flow you can generate from each user. Again, your revenue model matters, with subscription based models delivering more predictable revenues than transaction based models and the discount rates you use to value the cash flows have to reflect risk differences.

Figure 1 brings together all of these variables into a picture:

Figure 1: Valuing Existing Users



As you look at the information that you will need to derive this value, you probably also recognize that the information disclosures that we have from user-based companies are seriously lacking. While we will try to patch our way to valuing a user in the example at the end of this section, we believe that the path forward has to include more complete user-related information from companies.

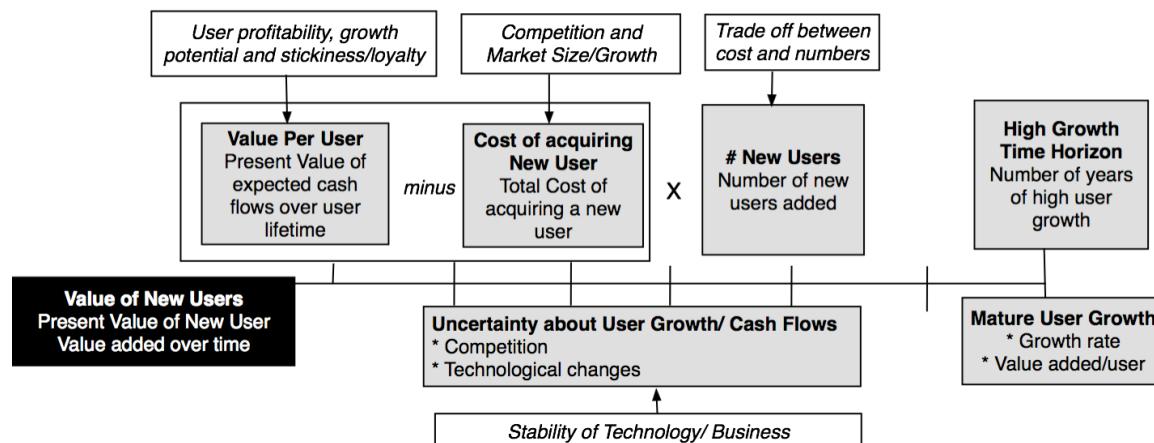
The Value of New Users

If you are a user-based company, your value comes not only from existing users but from the new users that you hope to acquire in the future. The value of a new user is driven by many of the same variables that drive the value of an existing user (user cash flow, growth and risk) but there are two additional parameters that enter the equation:

- **Cost of adding a new user:** New users can be costly to acquire and that cost has to be netted out against value. Thus, if the value of an existing user is \$120 and it costs \$50 to acquire a new user, the value of a new user is \$70 and it has to be adjusted for when you will acquire the user. A user you acquire in year 1 will be worth more than one you acquire in year 5.
- **Risk:** There is an added risk in businesses that derive the bulk of their value from new users they expect to add in future years, since the expected number of new users is an estimate and other factors (technology, competition etc.) can lead to the quantity and quality of users being different. To the extent that some of this risk is firm-specific and hence diversifiable, you may not adjust discount rates for the risk, but any macroeconomic factors that cause new user numbers to change may affect value.

As with the value of an existing user, you can capture the drivers of new user value in a picture (as we have attempted to, in Figure 2):

Figure 2: Value of New Users



The value of new users in this model in this model is driven by a mix of three factors, the value of an existing user, the cost of adding a new user and the number of new users added. While it is easy to hold all else constant, and show the value of new users increases as you increase the value of an existing subscriber, or reduce the cost of

acquiring a new user or increase the number of users, user-based companies face trade-offs across these variables. Lowering the cost of a new user may also go with a lower growth rate in users, making the net effect uncertain. We will return to this topic later in the paper, when we examine the value dynamics of user-based models.

The Corporate Drag

There is one final component of value in user-based companies that has to be brought into the valuation, for it to be complete. Even in user and subscriber-based companies, there are costs that are not directly related to users that have to be accounted for somewhere in the valuation. These costs include much of the ubiquitous G&A cost line item that you see in most companies, but can also include operating costs that are not directly related to users. These costs have to be valued and brought in, for the final valuation to reflect a true value for the company. In the same vein, when valuing user-based companies, there are many expenses that are unrelated either to servicing existing users and cannot be directly tied to acquiring new users that have to be incorporated in the valuation. Take Netflix, for instance, where an existing subscriber costs little to service, and delivers approximately \$100 in annual revenues. The company spent more than \$9 billion in 2017, acquiring and making new content, and it is this new content that retains existing subscribers and attracts new subscribers. At the same time, it is almost impossible to determine how much of this spending is for existing customers and how much is to grow the subscriber base. Consequently, you may choose to ignore this cost when valuing existing and new users at Netflix, but you cannot ignore it, if your intent is to invest in the company.

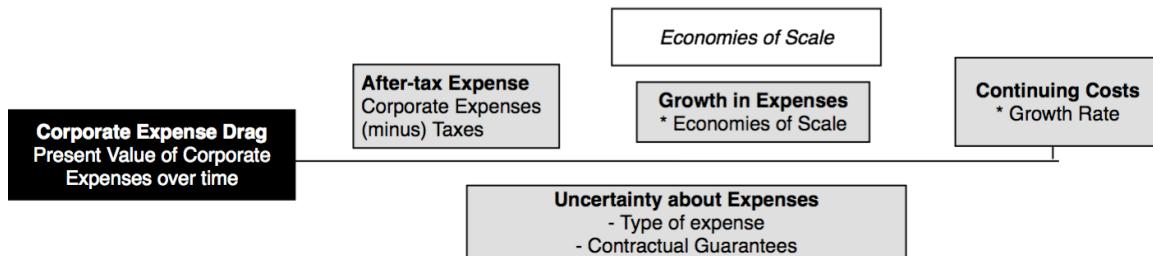
To value these non-user related costs or corporate drag as we prefer to term it, we first have to determine how much of the existing costs go into this category. The only way to make sure that you are not missing big chunks of costs is to work backwards from the total costs. Thus, whatever costs you have not assigned to existing users and new users in your model will have to go into the corporate drag category. To provide a simple illustration, assume that you are valuing users at a company that has 10 million existing users, up from 8 million in the prior year. Assume also that you have estimated a cost of \$25/year for servicing existing users and \$100 for acquiring a new user. Finally, assume that the company had total operating expenses of \$750 million in the most recent year. The corporate drag is estimated below:

- Cost of servicing existing users = $\$25 * 9 \text{ million} = \225 million (using the midpoint of the 8 million that you started the year with and the 10 million that you ended it with)
- Cost of adding new users = $\$100 * 2 \text{ million} = \200 million
- Total Costs for the company for period = \$750 million
- Corporate Drag = $\$750 - \$225 - \$200 = \325 million

Once you estimate the corporate drag, valuing it requires you to make two other assumptions. The first is the expected growth rate in that cost, and that growth rate will depend on how connected the cost is to the user base. In general, there will be economies of scale that will cause these expenses to grow at a lower rate, at least at healthy firms, than the growth rate in revenues from existing and new users. The

second is the uncertainty about these costs, which will depend upon the cost type and structure. Netflix, for instance, enters into long term contracts with studios, where its costs in future years are contractually set, effectively making them more certain and a greater drag on value. Figure 3 captures the corporate drag effect on value:

Figure 3: Corporate Expenses



There are interesting implications that come from component of value as well. For example, there are costs and benefits associated with having corporate drag costs which are mostly fixed and a large portion of total expenses. Firms can benefit from this because growth will create a much bigger boost for earnings, but the same is true on the downside. If users start to spend less or new user growth slackens, the high fixed costs at these companies can cause implosions and put survival at risk.

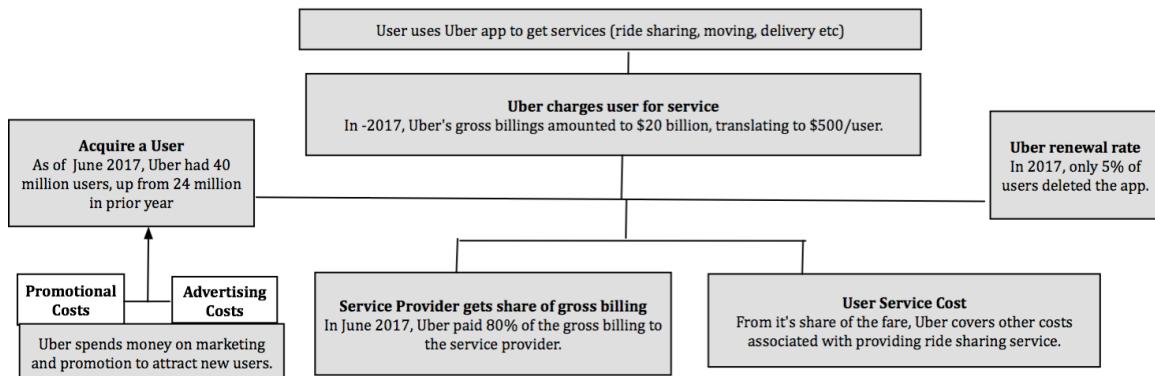
Application 1: A Rider-based Valuation of Uber in June 2017

In 2017, Uber, the ride sharing company, had succeeded in disrupting the car service business around the globe. With 40 million riders/users, operating in more than 180 countries, Uber had gross billings of \$20 billion in the twelve months leading into June 2017, translating into revenue of \$6.5 billion for the period; its business model is predicated around connecting drivers with Uber users who need car service and keeping a share (20%, in 2017) of the gross fare. However, the company still faced multiple challenges, some self-inflicted, and some from outside forces. First, its business model, while successful at delivering rider and revenue growth, was not profitable, and the company reported a loss of \$2.8 billion in 2017. Second, the company was fighting battles against regulators and courts in multiple cities on many fronts, creating not legal costs and uncertainty about future revenues and profits. Third, the company's board of directors and top management was in turmoil, with the CEO, Travis Kalanick, taking a (forced) leave of absence. We will value Uber, first using an aggregated valuation model, and then take another try, valuing its users.

The Mechanics of Uber

Before we value Uber, it is important that we understand how its business model is structured, and in the process, understand how it makes money (or at least plans to make money). Notwithstanding its more grandiose plans, Uber, in June 2017, remained primarily a ride sharing company, connecting riders with drivers, and claiming a share of the ride fare in return.

Figure 4: The Mechanics of Uber's Business



In its simplest form, Uber's business model is built on being a middle man between rider and driver, keeping a share of the fare to cover other expenses related to doing business.

Aggregated Valuation

Notwithstanding its outsized profile, Uber is still a young company and in keeping with our argument in chapter 9, its value has to be built around a story. To value Uber in June 2017, we built the valuation around the following story lines:

- **The company will grow, both globally and across the logistics business:** The company will continue to be able to grow its revenues, as it expands from car service into delivery and moving businesses, and attracts new users into the business, and increasingly looks overseas. We see gross billings growing to \$215 billion in 10 years, representing a market share of 40% of their expanded market.
- **With increased competition:** As it grows, it will feel pressure from competitors who will try to hire away its service providers, causing the share of gross billings to drop to 15% in 10 years, leading to revenues of \$32.2 billion in year 10.
- **And gradual improvement in margins:** The company's operating margins will turn positive, as economies of scale kick in, in about five years. However, competition and regulatory costs will result in a target operating margin of 20% by year 10. (The after-tax operating income in year 10, with a 30% tax rate, will be \$4.514 billion)
- **With increased capital intensity:** The company's business model, which has historically been capital-light, largely because Uber does not buy or own cars, will become more capital intensive as Uber invests in electric cars and infrastructure to compete with Google and other players entering the self-driving car business. We assume that every dollar invested in the business will generate \$3 in revenues, leading to significant reinvestment in 2017-2020, as the company grows.
- **And substantial risk:** Uber remains a risky company and we will give it a cost of capital of 10%, representing the 75th percentile of all publicly traded companies in the United States. As the company's risk profile improves due to

revenue growth and operating leverage, we project that the cost of capital will fall to 8%. Since the company is still money losing and dependent on external capital to make it through the next five years of negative cash flows, we will assume that there remains a 5% chance of failure.

The resulting valuation is captured in Figure 5:

Uber, The Global Logistics Company with a behavior problem (June 2017)						
The Story						
Uber is a logistics company, doubling the market size by drawing in new users. It will enjoy weak global networking benefits while seeing its slice of revenues slip (85/15), higher costs (with drivers as partial employees) and low capital intensity. <i>The extracurricular problems at the company, with its legal tangle with Google's Waymo division and accusations of condoning of sexual harassment will slow the company down in the near term but not damage it enough to alter its story significantly.</i>						
The Assumptions						
	Base year	Years 1-5	Years 6-10	After year 10	Story link	
Total Market	\$200,000		Grow 10.39% a year	Grow 1.5% a year	Delivery & Moving + Ridesharing	
Gross Market Share	10.00%		10%->0%	40%	Big player	
Revenue Share	20.00%		20% -> 15%	15.00%	Lower revenue share	
Operating Margin	-43.08%		-43.08% ->20%	20.00%	Cost pressures continue	
Reinvestment	NA		Sales to capital ratio of 3.00	Reinvestment rate = 7.5%	More capital investment model	
Cost of capital	NA	10.00%	10%->8.00%	8.00%	At 75th percentile of US firms	
Risk of failure		5% chance of failure, if pricing meltdown leads to capital being cut off			Cash on hand + Capital access	
The Cash Flows						
	Total Market	Market Share	Revenues (15% of Gross)	EBIT (1-t)	Reinvestment	FCFF
1	\$ 220,780	13.00%	\$ 8,826	\$ (2,105)	\$ 775	\$ (2,880)
2	\$ 243,719	16.00%	\$ 11,309	\$ (1,983)	\$ 828	\$ (2,811)
3	\$ 269,041	19.00%	\$ 13,930	\$ (1,564)	\$ 874	\$ (2,438)
4	\$ 296,995	22.00%	\$ 16,661	\$ (820)	\$ 911	\$ (1,731)
5	\$ 327,853	25.00%	\$ 19,466	\$ 270	\$ 935	\$ (665)
6	\$ 361,917	28.00%	\$ 22,294	\$ 1,715	\$ 943	\$ 772
7	\$ 399,520	31.00%	\$ 25,080	\$ 3,511	\$ 929	\$ 2,583
8	\$ 441,030	34.00%	\$ 27,741	\$ 3,884	\$ 887	\$ 2,997
9	\$ 486,853	37.00%	\$ 30,173	\$ 4,224	\$ 811	\$ 3,414
10	\$ 537,437	40.00%	\$ 32,246	\$ 4,514	\$ 691	\$ 3,823
Terminal year	\$ 548,723	40.00%	\$ 32,923	\$ 4,609	\$ 484	\$ 4,125
The Value						
Terminal value			\$ 69,920			
PV(Terminal value)			\$ 28,479			
PV (CF over next 10 years)			\$ (2,103)			
Value of operating assets =			\$ 26,376			
Probability of failure			5%			
Value in case of failure			\$ -			
Adjusted Value for operating assets			\$ 25,057			
+ Cash on hand			\$ 5,000			
+ Cross holdings			\$ 6,000			
Value of all assets			\$ 36,057	Most recent pricing put the price at greater than \$70 billion		

The value of Uber, based upon our story for the company, is \$36 billion. Note that the operating assets are worth \$25 billion and the additional \$11 billion come from two other investments: a share of Didi Chuxing, the Chinese ride sharing company, worth \$6 billion, and \$5 billion in cash, from their latest capital round.

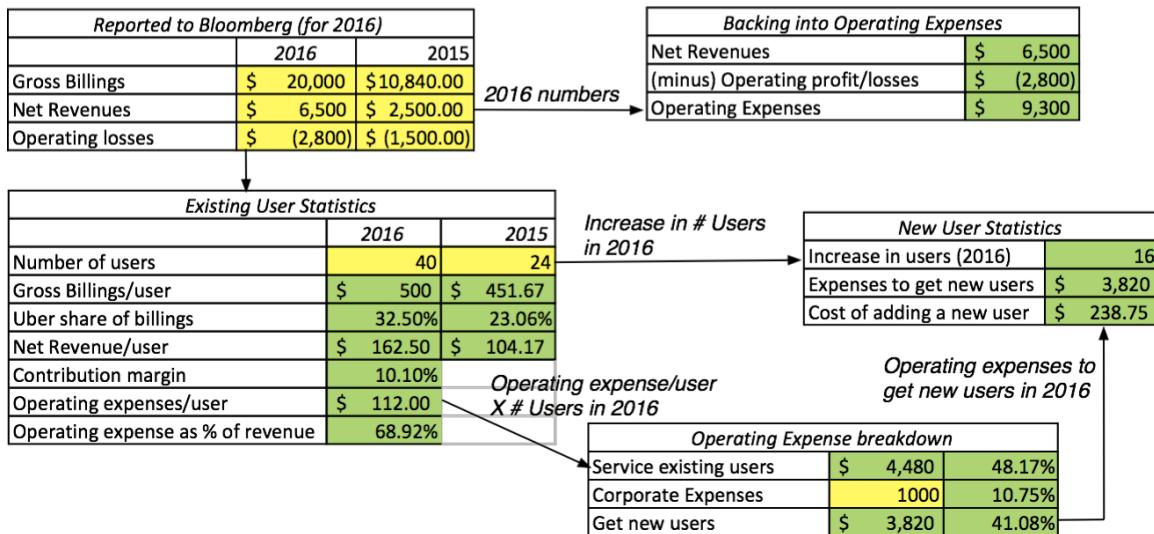
User-based Valuation

The pushback that we received on the Uber aggregated valuation was that Uber was a user-based company and that valuing it on an aggregated basis was missing that link to value. Consequently, we revalued Uber, using the user valuation framework developed earlier this chapter.

1. Deconstructing the Financial Statements

Uber is a privately held company and its financial disclosures take the form of leaks that selectively reveal information about the company. It was therefore a particular challenge to estimate how much the company is spending and for what purpose. Starting with the crude information that we had on gross billings (\$20 billion in the most recent 12 months), the \$6.5 billion in revenues and \$2.8 billion in operating loss and the number of users (40 million at the time of the valuation, up 16 million from the prior year), we tried to back out the numbers that we need for valuing users in figure 6:

Figure 6: Deconstructing Uber's Financials



While this may seem like grasping for straws, we started with the total operating expense of \$9.3 billion (obtained by adding back operating losses to revenues) and used the contribution margin that the company also leaked (10.10% of revenues in its existing markets) to estimate how much of the expenses were for servicing existing users (amounting to \$4.48 billion). After estimating that the corporate drag was \$1 billion, we assumed that the remaining costs (\$3.82 billion) were spent acquiring new users (16 million during the year) to estimate the cost per new user to be \$238.75.

2. Value of Existing Users

To value an existing user, we started with the current revenues (which allows us to estimate gross billings per user) and then assume that the Uber's share of these gross billings would drop over time from 20% to 15%. Adding on the assumption that existing users augment their use of the system, we assumed an annual growth rate of 12% in gross billing, in conjunction with a renewal rate of 95%, since relatively few users drop out of the Uber ecosystem.⁵ Finally, we assumed that 80% of Uber's existing costs for servicing users are variable, growing at the same rate as revenues,

⁵ Given that Uber is a private company with very little publicly available data, there is little scope for applying more sophisticated techniques to refine renewal rates. As noted earlier, though, the input matters less here than you may think, because the revenues per user are computed by dividing the aggregate revenues by the total number of users; if many of them are not using the service, it should show up as lower revenues/user and a lower value per user.

and the remaining 20% of its costs are fixed, growing at 5% a year. The resulting value per user is captured in Figure 7:

Figure 7: Value of Existing Users at Uber

Growth rate in Operating Expenses																
Assumed that 80% of operating expenses are variable, growing at revenue growth rate. Rest are fixed, growing at 4%/year.																
User Lifetime																
Assumed to be 15 years, with an annual renewal probability of 95%.																
	Base Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Survival Likelihood	1.0000	0.9500	0.9025	0.8574	0.8145	0.7738	0.7351	0.6983	0.6634	0.6302	0.5987	0.5688	0.5404	0.5133	0.4877	0.4633
Gross Billings	\$ 500.00	\$ 560.00	\$ 627.20	\$ 702.46	\$ 786.76	\$ 881.17	\$ 986.91	\$ 1,105.34	\$ 1,237.98	\$ 1,386.54	\$ 1,552.92	\$ 1,739.27	\$ 1,947.99	\$ 2,181.75	\$ 2,443.56	\$ 2,736.78
Net Revenues	\$ 100.00	\$ 112.00	\$ 125.44	\$ 140.49	\$ 157.35	\$ 176.23	\$ 197.38	\$ 221.07	\$ 247.60	\$ 277.31	\$ 310.58	\$ 347.85	\$ 388.60	\$ 436.35	\$ 488.71	\$ 547.36
Variable Operating Expenses	\$ 38.54	\$ 43.16	\$ 48.34	\$ 54.14	\$ 60.64	\$ 67.91	\$ 76.06	\$ 85.19	\$ 95.41	\$ 106.86	\$ 119.69	\$ 134.05	\$ 150.14	\$ 168.15	\$ 188.33	\$ 210.93
Fixed Operating Expenses	\$ 9.63	\$ 10.12	\$ 10.62	\$ 11.15	\$ 11.71	\$ 12.30	\$ 12.91	\$ 13.56	\$ 14.23	\$ 14.95	\$ 15.69	\$ 16.48	\$ 17.30	\$ 18.17	\$ 19.07	\$ 20.03
Operating Profit/user	\$ 51.83	\$ 58.72	\$ 66.48	\$ 75.20	\$ 85.00	\$ 96.02	\$ 108.41	\$ 122.32	\$ 137.95	\$ 155.50	\$ 175.21	\$ 197.33	\$ 222.16	\$ 250.03	\$ 281.31	\$ 316.40
After-tax Operating Profit/user	\$ 36.28	\$ 41.11	\$ 46.54	\$ 52.64	\$ 59.50	\$ 67.22	\$ 75.89	\$ 85.62	\$ 96.56	\$ 108.85	\$ 122.64	\$ 138.13	\$ 155.51	\$ 175.02	\$ 196.91	\$ 221.48
PV of AT Operating Profit		\$ 37.37	\$ 38.46	\$ 39.55	\$ 40.64	\$ 41.74	\$ 42.84	\$ 43.94	\$ 45.05	\$ 46.16	\$ 47.28	\$ 48.41	\$ 49.55	\$ 50.70	\$ 51.85	\$ 53.02
Survival Adjusted PV		\$ 35.50	\$ 34.71	\$ 33.91	\$ 33.10	\$ 32.30	\$ 31.49	\$ 30.68	\$ 29.89	\$ 29.09	\$ 28.31	\$ 27.54	\$ 26.78	\$ 26.03	\$ 25.29	\$ 24.56
Annual Growth Rate (Revenues)	12.00%															
Risk-adjusted discount rate	10%															
Life of user =	15.00															
Probability of full life =	46.33%															
Value per existing user =	\$ 449.17															
Number of existing users =	40.00															
Value of Existing Users	\$ 17,966.80															

Survival-adjusted PV
PV of after-tax operating income, adjusted for drop out rate over time.

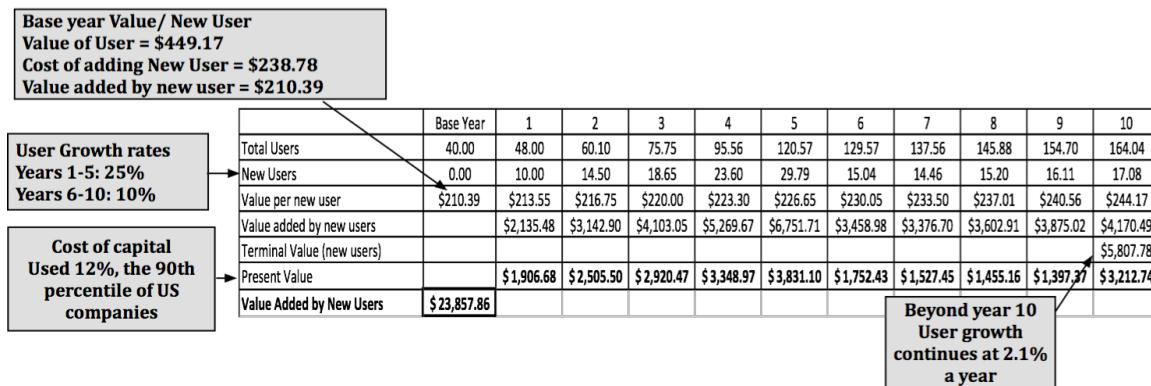
Risk Adjusted Discount Rate
Used a 10% cost of capital, set at 75th percentile of global companies, adjusted for inflation difference.

Based upon our assumptions, the value of an existing user at Uber is \$449.17, which when multiplied by 40 million users, yields a total value of \$17,967 million.

3. Value of New Users

To value new users, we add two elements. The first is the cost of acquiring users, which we estimated to be \$238.75, growing at the inflation rate. The second is the number of new users. In keeping with our story of Uber expanding both globally and across logistics business, we assumed a growth rate of 25% a year in the number of users for the next five years and 10% a year in the following five years, before settling into stable growth (where users grow at about 1.5% a year in perpetuity). Since these cash flows are riskier, we will use a cost of capital of 12% (set at the 90th percentile of global companies), to discount them. Figure 8 measures the value of new users at Uber.

Figure 8: Value Added by New Users at Uber



The value per new user is \$210.39 currently (\$449.17- \$238.78), and it will grow at the inflation rate over time, leading to a collective value for new users of \$23,858 million.

4. The Corporate Drag

To value the corporate drag, we started the initial cost of \$1 billion and assume that it would grow at 5% a year, lower than the growth rate in users and revenues, largely because most of these costs are likely to be fixed costs. Reverting back to a 10% cost of capital, the resulting value is captured in Figure 9:

Figure 9: Uber - Corporate Expense Drag

The value of corporate drag is \$10,369 million and this reduces the overall value of the company.

5. Overall Value of Uber

To get the overall value of Uber, from a user perspective, we bring together all three components:

Value of Uber Operating Assets

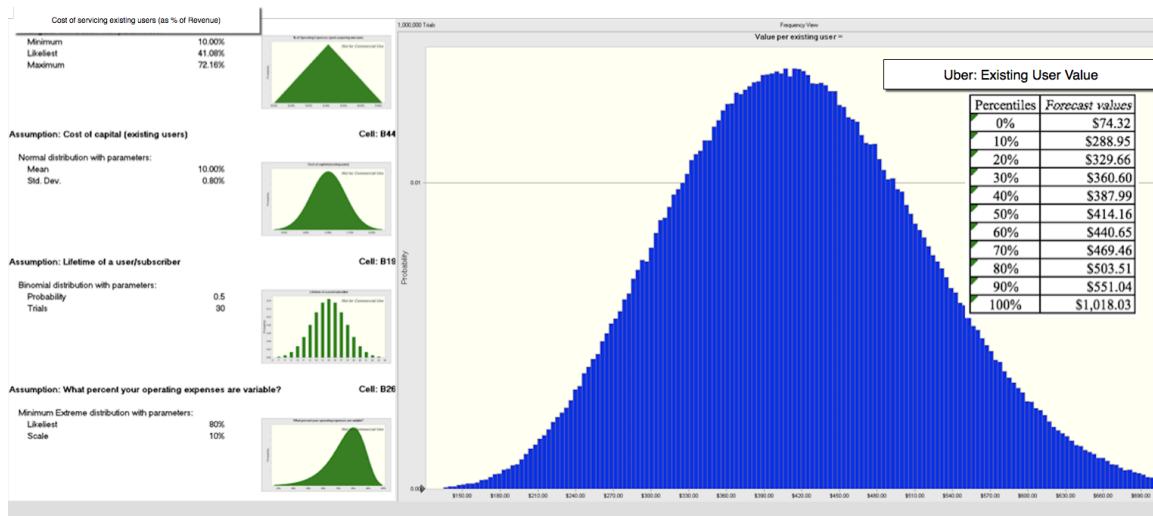
$$\begin{aligned}
 &= \text{Value of Existing Users} + \text{Value of New Users} - \text{Corporate Drag} \\
 &= \$17,967 \text{ millions} + \$23,858 \text{ millions} - \$10,369 \text{ millions} = \$31,456 \text{ million}
 \end{aligned}$$

Adding cash (\$5 billion) and the value of the Didi Chuxing holding (\$6 billion) yields a value of \$42.5 billion for the company, a little higher than the aggregated value that we estimated earlier.

6. Dealing with Uncertainty

If your concern in the Uber valuation is the number of assumptions that we had to make along the way to derive a value per user, it is well placed but at the same time, there is little that we can do about it. Some of the uncertainty could be mitigated, if Uber were more transparent about rider costs and revenues, but most of the uncertainty, at least in this case, is reflective of the reality that this is a young business, with many potential future paths. Rather than wring our hands over this, we prefer to face up to the uncertainty more directly, by replacing our point estimate inputs (for growth and costs) with probability distributions that reflect our uncertainty. That allows us to then replace our single estimate of value with a Monte Carlo simulation that yields a distribution of values for an Uber user in Figure 9:

Figure 9: Monte Carlo Simulation of Uber User Value



Note that there are four input variables - the cost of servicing a user, the cost of capital, the lifetime of a user and the percent of operating expenses that are variable – where we have replaced the single number inputs that we had with distributions, albeit with the same expected value. Not surprisingly, the median value of a user, across a million simulations, is \$414, close to the \$449 value that we obtained with the point estimates. The range of the distribution, though, is large, with the value of a user ranging from \$289 (at the first decile) to \$551 (at the ninth decile). While you can attribute that to our poor valuation skills, we are more inclined, perhaps self-servingly, to view that as a reflection of real uncertainty about the future.

Application 2: Valuing Netflix in April 2018

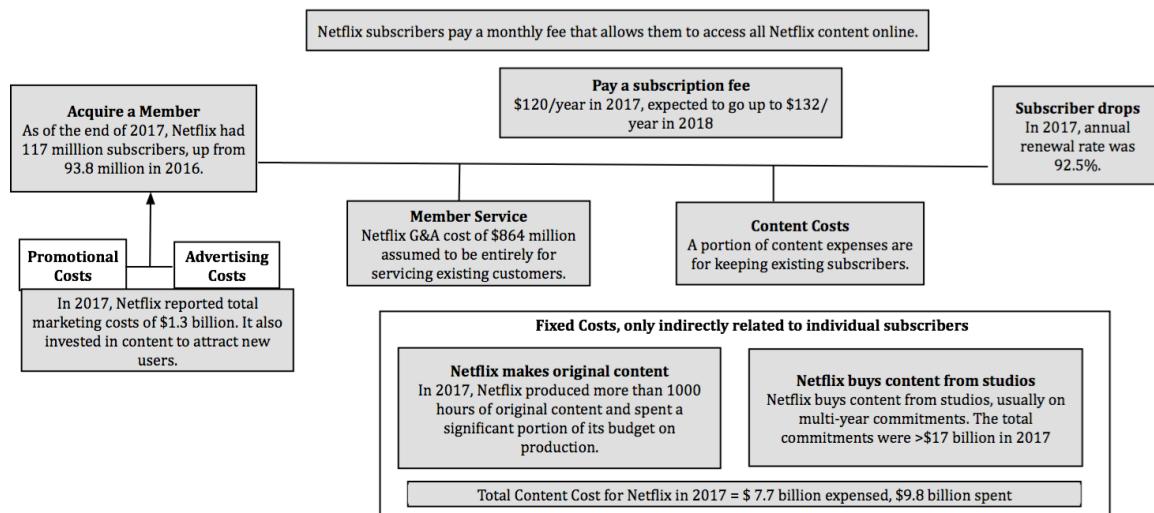
Since going public in 2002, Netflix has disrupted two businesses. First, it displaced the brick and mortal video rental business, dominated by Blockbuster, with its subscription-based, mailed-video model. Second, starting in 2012, it has broken into the entertainment business, on both the content side, by spending immense amounts on original content, and on the customer side, by changing the way we watch television. In the process, it has built a business with more than a hundred million subscribers globally, who not only pay more than a hundred dollars, on average, to

watch Netflix content, but also provide data on their watching habits to the company, which it uses to create new content.

The Mechanics of Netflix

To describe Netflix as a streaming company misses its complexity, since it has long since left that label behind. It does make its revenues from subscribers who pay a monthly or an annual fee, to watch its offerings, but its content now is just as likely to be homemade as it is to be leased from a studio. Figure 10 breaks down the Netflix business model, at least as of April 2018:

Figure 10: The Mechanics of the Netflix Business Model



Note that while Netflix's biggest expense, creating and licensing content, is clearly directed at keeping and acquiring subscribers. At the same time, it is not directly related to user count, and this will have important consequences for value.

User-based Valuation

To value Netflix, we start by breaking Netflix expenses into three parts: those associated with (a) servicing existing subscribers, (2) acquiring new subscribers and (3) corporate costs, not directly related to user numbers. We then value the company by valuing each of these three segments separately.

Deconstructing the Financial Statements

Netflix reported \$838 million in operating profit in 2017, on revenues of \$11.693 billion, while also reporting a surge in the number of users from 93.8 million to 117.6 million. Using the information in the financial statement, we began by breaking down the total operating expenses at the company, shown in Figure 11, into costs associated with servicing existing subscribers (G&A cost and 20% of expensed content costs), getting new subscribers (capitalized content cost and marketing costs) and corporate costs (technology and development and 80% of expensed content costs).

Figure 11: Breaking Down Netflix Operating Expenses			
Subscriber Statistics			
	2017	2016	Change
Number of Subscribers	117.60	93.80	23.80
Revenue/Subscriber	\$113.16	\$103.32	
Content Cost Breakdown			
Content Costs (Cash expens)	\$9,806.00		
Content Costs Expensed	\$ 7,660.00		
Content Costs Capitalized	\$2,146.00		
Netflix: Operating Income in 2017			
Revenues	\$ 11,693.00	As %	
Marketing Costs	\$ 1,278.00	10.93%	
G&A Costs	\$ 864.00	7.39%	
Technology & Development	\$ 1,053.00	9.01%	
Content Costs Expensed	\$ 7,660.00	65.51%	
Operating Profit	\$ 838.00	7.17%	
Cost of acquiring new subscribers			
Total User Acquisition Costs	\$3,424.00		
Change in Subscribers in 2017	30.84		
Cost per new Subscrber	\$ 111.01		
Cost of Servicing Existing Subscribers			
Revenue/Subscriber in 2017	\$113.16		
G&A Cost as % of Revenue	7.39%		
Subscriber-related Content Co	\$1,532.00		
Corporate Costs (unrelated to Subscribers)			
Technology & Development	\$1,053.00		
Corporate Content Costs	\$6,128.00		

The allocation of content costs between existing subscribers, new subscribers and into corporate costs reflects our subjective input, but in the absence of clear information from Netflix, we had no other option. Based upon our estimates, the cost of acquiring a new subscriber is \$111.01, and the cost of servicing an existing subscriber is \$21.39.

Valuing Existing Subscribers

In 2017, Netflix reported that it generated \$113.16 per subscriber per year, reflecting its geographical mix of subscribers. Netting out \$21.39, the cost of servicing a subscriber each year, yields an operating profit of \$91.77 per subscriber before taxes, and \$68.83 per subscriber, after taxes. In Figure 12, we estimate the value of existing subscribers at Netflix, further taking into account Netflix's cost of capital and the average lifetime of Netflix subscribers.

Figure 12: Value of Netflix's Existing Subscribers																
Streaming technology expected life of 15 years.																
Value of Existing Subscribers	Base Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Membership Survival	1.0000	0.9250	0.8556	0.7915	0.7321	0.6772	0.6264	0.5794	0.5360	0.4958	0.4586	0.4242	0.3924	0.3629	0.3357	0.3105
Revenue/Subscriber	\$ 113.16	\$118.82	\$124.76	\$131.00	\$137.55	\$144.42	\$151.65	\$159.23	\$167.19	\$175.55	\$184.33	\$193.54	\$203.22	\$213.38	\$224.05	\$235.25
Cost/Subscriber	\$ 21.39	\$ 21.82	\$ 22.25	\$ 22.70	\$ 23.15	\$ 23.62	\$ 24.09	\$ 24.57	\$ 25.06	\$ 25.56	\$ 26.07	\$ 26.60	\$ 27.13	\$ 27.67	\$ 28.22	\$ 28.79
Operating Profit/Loss per Subscriber	\$ 91.77	\$ 97.00	\$102.51	\$108.30	\$114.39	\$120.81	\$127.56	\$134.66	\$142.13	\$149.99	\$158.25	\$166.95	\$176.09	\$185.71	\$195.83	\$206.46
Tax rate	25.00%	25.000%	25.000%	25.000%	25.000%	25.000%	25.000%	25.000%	25.000%	25.000%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
After-tax Operating Income	\$68.83	\$67.29	\$65.78	\$64.28	\$62.81	\$61.36	\$59.93	\$58.52	\$57.13	\$55.77	\$54.43	\$53.11	\$51.82	\$50.55	\$49.31	\$48.09
Present Value (at Cost of Capital)	\$62.34	\$56.45	\$51.10	\$46.25	\$41.86	\$37.87	\$34.26	\$30.98	\$28.01	\$25.33	\$22.90	\$20.69	\$18.70	\$16.90	\$15.26	
Life of subscriber =	15.00															
Value per Subscriber =	\$508.89															
Number of Subscribers =	117.60															
Value of Existing Subscribers =	\$59,845.86															

Assuming that Netflix has pricing power and can increase subscriber fees by 5% a year, while keeping content costs growing at only 2% a year, results in higher operating income over time. Finally, incorporating another of Netflix's strengths, its high renewal rate of 92.5%,⁶ and discounting back at Netflix's cost of capital of 7.95%, reflecting its business mix and debt ratio, we arrive at a value of \$508.89 per user and a total value of \$59.8 billion for all 117 million subscribers.

Valuing New Subscribers

⁶ The renewal rate is a key number here and we tried to use the more sophisticated approach that McCarthy and Fader suggest for a more refined value, but quickly ran into data constraints.

To value new subscribers, we start with the value of an existing subscriber of \$508.89, derived in the last section, and net out the cost of \$111.01, for acquiring a new subscriber, to arrive at a value per new subscriber of \$397.88, in today's dollars. In Figure 13, we value new subscribers at Netflix.

Figure 13: Value of New Subscribers at Netflix

Cost of Acquiring a New Subscriber	\$ 111.01	Net Subscriber base increases 15%/year in years 1-5					Net Subscriber base increases 10%/year in years 6-10					
Value per new user (in today's \$) =	\$397.88	Base Year	1	2	3	4	5	6	7	8	9	10
Total Subscribers	117.60	135.24	155.53	178.85	205.68	236.54	260.19	286.21	314.83	346.31	380.94	
New Subscribers	0.00	26.46	30.43	34.99	40.24	46.28	41.39	45.53	50.09	55.10	60.60	
Value per Subscriber	\$397.88	\$405.84	\$413.96	\$422.24	\$430.68	\$439.30	\$448.08	\$457.04	\$466.18	\$475.51	\$485.02	
Value added by new Subscribers		\$10,739	\$12,596	\$14,775	\$17,332	\$20,330	\$18,548	\$20,811	\$23,349	\$26,198	\$29,394	
Terminal Value (New Subscribers)											\$31,674	
Present Value		\$9,948	\$10,809	\$11,746	\$12,763	\$13,868	\$11,721	\$12,182	\$12,662	\$13,160	\$28,418	
Value Added by New Users	\$137,276	Discounted back at a cost of capital at 7.95%, Netflix cost of capital					Number of new subscribers expected to increase 1% a year in after year 10					

To complete the process, we assumed that the net subscriber base would grow 15% a year for the next five years and 10% a year from years six through ten, before subsiding to a 1% growth rate thereafter.⁷ Also allowing the value of a new subscriber to grow at the inflation rate of 2%, and discounting back at the Netflix cost of capital of 7.95%, yields a value of \$137.3 billion for new users.

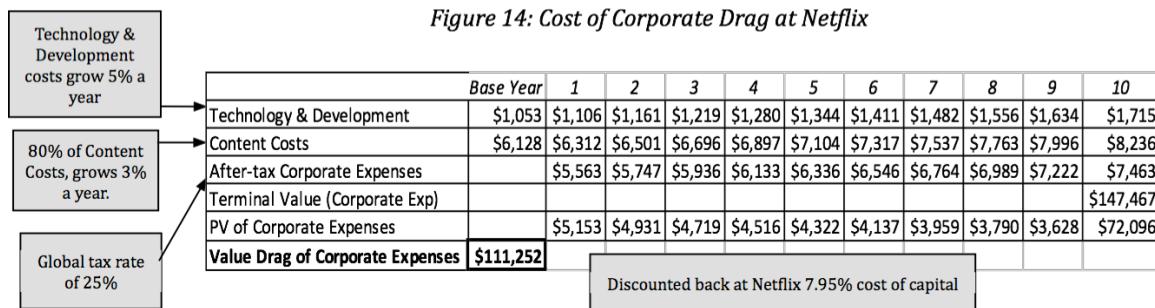
The Corporate Cost Drag

The final component of the analysis is the most weighty, at least for Netflix, since it includes \$1,053 million in technology and development costs and \$6,128 million in content costs. If these costs grow with subscriber count and revenues, Netflix will drown in these costs. In figure 14, we make the assumption that once Netflix gets through its immediate growth phase, it will find a way to get these costs under control.

⁷ Note that to get net subscribers to grow at 15% a year, Netflix has to add more than number in new subscribers, because its renewal rate is 92.5%. To illustrate, we start the first year with 117.6 million members, but will lose 7.5% of those members due to non-renewal. To be able to grow the net subscriber base by 15%, you will have to add enough members to also cover the non-renewals, giving you a total add on of 26.46 million members in year 1.

New Subscribers in year 1 = $117.6 \times (1.15) + 117.6 \times (1 - .925) = 26.46$ million

We repeat this process each year.



Even with content costs growing 3% a year, the value of the corporate cost drag reduces the value of Netflix by \$111.3 billion.

Valuing Netflix

With the value of existing and new subscribers in hand, as well as the corporate cost drag, we can estimate the value of Netflix, as a company, in table 1.

Table 1: Value of Netflix on April 16, 2018

Valuing Netflix	
Value of Existing Subscribers	\$59,845.86
+Value of New Subscribers	\$137,276.49
- PV of Corporate Drag	\$111,251.70
= Value of Operating Assets	\$85,870.65
+ Cash & Cross Holdings	\$2,823.00
- Debt	\$6,500.00
Value of Equity	\$82,193.65
- Value of Equity Options	\$ 4,978.00
Value of Equity in common stock	\$77,215.65
Number of Shares	446.81
Value per Share	\$ 172.82

The value of the operating assets of \$85.9 billion is augmented with Netflix's cash holdings of \$2.8 billion and reduced by Netflix debt of \$6.5 billion, yielding a value of equity of \$82.2 billion. Netting out the value of management options outstanding at the end of 2017 and dividing by the shares outstanding on that date yielded a value per share of \$172.82 on April 16, 2018. The stock was trading at \$280 per share, suggesting either that we have been too pessimistic about Netflix's future prospects or that the market is over valuing the company.

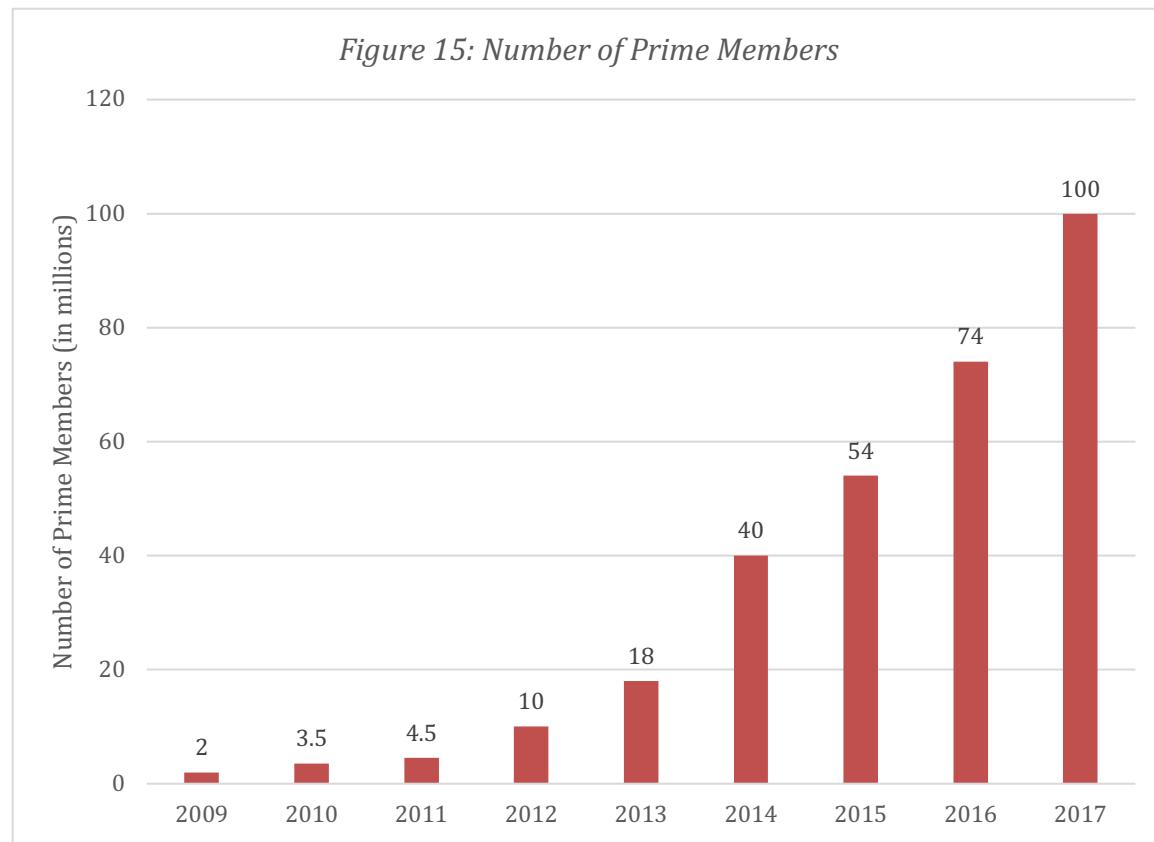
Application 3: Valuing Amazon Prime in April 2018

Amazon has had spectacular success disrupting the retail business in the United States in the last two decades and in delivering returns to its stockholders. As it has grown, it has stayed true to its ethos of going after revenues first and waiting patiently

for profits. When it introduced its Prime membership in 2004, it offered an almost irresistible bargain for subscribers in the form of free shipping on all Prime orders in return for a \$75 annual membership fee. While that fee was increased to \$99 in 2014 and to \$119 in 2018, the services that Prime members receive has also expanded to include access to Amazon media (movies and television series). In this illustration, we value Amazon Prime in April 2018, when the membership rolls hit 100 million.

The Growth of a Phenomenon

Amazon introduced Prime in 2005 and the service was slow to take off. At the end of 2011, only about 4% of Amazon customers were Prime members. In the years since, though, the service has seen explosive growth, as shown in Figure 15:



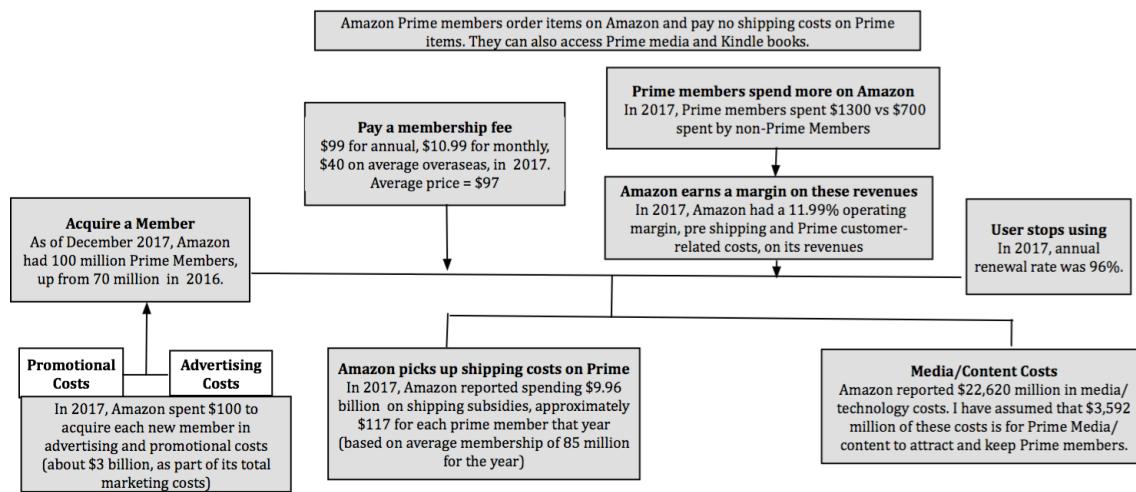
In fact, the jump in members in the last three years is particularly impressive, given how much bigger the base has become. In 2016, the company added almost 20 million new members and is on pace to add a similar number this year. By the end of 2017, the company's mammoth Prime user base meant that almost 60% of all US households had memberships, suggesting that a non-Prime member is more the exception than the rule for Amazon's US operations. Growth has been slower outside the US, slowed both by competitive/regulatory pressures and logistical challenges.

The Mechanics of Amazon Prime

To understand how Amazon Prime works, let's break down the mechanics. In the countries where Prime is offered, anyone can become a Prime member, either on a

monthly or an annual basis. In the US, in 2017, the annual fee for membership was \$99, as it has been for the last few years, and the monthly fee was \$10.99.⁸ With 100 million members, that translates into a total revenue for the company of about \$10 billion; the monthly members pay more but there is a portion of the membership (including students) who get discounted memberships. The other benefit for Amazon, though, comes from the fact that Amazon Prime members spend more on Amazon than non-Prime members. While the exact numbers are known only to Amazon, the most recently leaked reports suggest that the typical Prime member spends approximately \$1,300/year on Amazon products, as opposed to the \$700 spent by a non-Prime member. While it seems obvious, then, that Prime membership leads to more spending (\$600, if you believe that the causal effect of a change in membership status is equal to the difference between these two numbers),, the statisticians will raise red flags about sampling bias since the true incremental revenue is unobservable; it is the difference between what the existing Prime members are spending (\$1300/year) and what those same members would have spent, if they did not have Prime memberships. That is a reasonable point, but there is still clearly a Prime impact, where Prime members choose Prime items over less expensive non-Prime offerings on Amazon. The mechanics of Amazon Prime are examined in Figure 16:

Figure 16: The Mechanics of Amazon Prime



The biggest cost of Prime to Amazon is the shipping cost that the company now bears on Prime items. In 2017, the company reported net shipping subsidy costs of \$9.96 billion (in the footnotes to the 10K) and assuming that almost all of these costs were related to servicing the 85 million members that Amazon had, on average, in 2017

⁸ On April 26, 2018, the company announced an increase in Prime membership fees to \$119 a year.

leads to a per-member shipping cost of close to \$117/member.⁹ The other free services that Amazon offers its Prime members also create costs, though those costs are embedded in larger company-wide items and are more difficult to separate out. We will attempt to break out these costs in the next section.

User-based Valuation

To value Amazon Prime, we follow the same process that we did to value Uber, keeping in mind that Amazon Prime is but a small piece of a very large enterprise. We began by first valuing existing Prime members, and then new Prime members and reducing the value of the members by the corporate cost drag.

Deconstructing the Financial Statements

Valuing Amazon Prime is more complicated than valuing Uber or Netflix, because it is a part of a very large company, where there is little information disclosure about income or expenses specific to Amazon Prime. In Table 2, we make an attempt at getting through the opacity and break down expenses into three groupings, Amazon Retail/Media, AWS (their cloud services business) and Amazon Prime, with the justifications in the last column.

Table 2: Breaking Down Amazon Operations

	Amazon Retail/Media	AWS	Amazon Prime	Amazon (Total)	Basis
Revenues	\$ 99,707	\$ 17,459	\$ 60,700	\$ 177,866	Prime members generate \$600 million more in revenues annually + \$9700 in subscription fees (10K)
Cost of Goods Sold	\$ 69,577	\$ -	\$ 42,357	\$ 111,934	Allocated based upon revenues to Amazon Retail/Media and Prime
Technology & Content	\$ 5,900	\$ 13,128	\$ 3,592	\$ 22,620	Amazon reported number for AWS. Balance allocated based upon revenues
Net Shipping Cost	\$ -	\$ -	\$ 9,960	\$ 9,960	Entirely to Amazon Prime
Other Operating Expenses	\$ 18,179	\$ -	\$ 11,067	\$ 29,246	Allocated based upon revenues to Amazon Retail/Media and Prime
Operating Income	\$ 6,051	\$ 4,331	\$ (6,276)	\$ 4,106	
Operating Margin	6.07%	24.81%	-10.34%	2.31%	
Operating Margin before tech/content	11.99%		-4.42%	15.03%	

In making these allocations, we assumed the following:

1. We have counted only the incremental revenues from Amazon Prime members (\$600 a member across the 85 million members that Amazon had, on average, over the year, and added the \$9.7 billion in subscription premiums that Amazon reported in 2017).
2. The net shipping costs have been fully allocated to Amazon Prime and all of the operating expenses that Amazon reported for AWS are assumed to be technology and content.
3. The remaining expenses are allocated across AWS and Amazon Retail/Media, in proportion to their revenues. In our judgment, both Amazon Retail/Media and AWS generated operating profits in 2017, but the latter was much more profitable, with a pre-tax operating margin of 24.81%. Amazon Prime was a money loser in 2017, but its margins are less negative than they used to be, and at 100 million members, it may be poised to turn the corner.

⁹ Amazon started the year with 70 million members and ended with 100 million, yielding an average number of 85 million. Since the shipping costs are over the course of the entire year, we divided the costs by 85 million to arrive at the per-member shipping cost.

4. There is one final component of cost that we would like to know, but have to guess at and that is the cost to Amazon of acquiring a new member. This is a raw estimate, since Amazon provides no information on the cost and unlike the cases of Netflix and Uber, where we assumed that marketing costs were entirely for acquiring new users, we could not assume the same for Amazon. That promotional/marketing cost is part of the total marketing cost that Amazon reported in 2017 and we will assume that the new member acquisition cost is \$100/member; in 2017, this would have translated into a total cost of \$3 billion to acquire 30 million new members, as the number of members increased from 70 million to 100 million.

It is true that these are subjective judgments that will affect our assessment of value for Amazon Prime, but in the absence of specifics, this is about all we could do.

Valuing Existing Prime Members

Following the same template that we did to value Uber riders and Netflix subscribers, we value Amazon Prime in three slices, starting with existing Prime members in figure 17:

Annual Renewal Rate = 9.6%											
	Base Year	1	2	3	4	5	6	7	8	9	10
Membership Survival	1.0000	0.9600	0.9216	0.8847	0.8493	0.8154	0.7828	0.7514	0.7214	0.6925	0.6648
Growth rate in incremental revenue		10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	8.00%	6.00%	4.00%	2.00%
Incremental Revenue/Member	\$ 600.00	\$ 660.00	\$ 726.00	\$ 798.60	\$ 878.46	\$ 966.31	\$ 1,062.94	\$ 1,147.97	\$ 1,216.85	\$ 1,285.52	\$ 1,350.83
Operating Margin (pre-shipping)	11.99%	12.19%	12.39%	12.60%	12.80%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%
Operating Income on Incremental Sales	\$ 71.94	\$ 80.47	\$ 89.98	\$ 100.59	\$ 112.43	\$ 125.62	\$ 138.18	\$ 149.24	\$ 158.19	\$ 164.52	\$ 167.81
Prime Membership Charge	\$ 97.00	\$ 98.94	\$ 100.92	\$ 102.94	\$ 105.00	\$ 107.10	\$ 109.24	\$ 111.42	\$ 113.65	\$ 115.92	\$ 118.24
Revenue/Prime Member	\$ 168.94	\$ 179.41	\$ 190.90	\$ 203.53	\$ 217.42	\$ 232.72	\$ 247.42	\$ 260.66	\$ 271.84	\$ 280.44	\$ 286.05
Shipping Cost/ Prime Member	\$ 117.18	\$ 120.69	\$ 124.31	\$ 128.04	\$ 131.88	\$ 135.84	\$ 139.91	\$ 142.71	\$ 145.57	\$ 148.48	\$ 151.45
Operating Profit/Loss per Member	\$ 51.76	\$ 58.72	\$ 66.59	\$ 75.49	\$ 85.54	\$ 96.88	\$ 107.50	\$ 117.95	\$ 126.27	\$ 131.96	\$ 134.60
Tax rate	20.00%	20.500%	21.000%	21.500%	22.000%	22.500%	23.000%	23.500%	24.000%	24.500%	25.00%
After-tax Operating Income	\$41.41	\$44.81	\$48.48	\$52.43	\$56.67	\$61.22	\$64.80	\$67.80	\$69.23	\$69.00	\$67.12
Present Value (at Cost of Capital)		\$41.53	\$41.64	\$41.73	\$41.81	\$41.86	\$41.06	\$39.82	\$37.68	\$34.81	\$31.38
Life of user =	20.00										
Value per Prime Member =	\$584.53										
Number of Prime Members =	100.00										
Value of Prime Members =	\$58,453.09										

Used a 7.90% cost of capital, close to Amazon's current cost of capital.

Continues through year 20, growing at inflation rate.

Growth rate is 10% for years 1-5, scaling down to inflation rate.

Pre-tax Operating Margin improves slightly to 13%

US corporate tax rate will be 25% in steady state.

Assuming that Amazon is able to increase its revenues/Prime member by 10% a year, while keeping its shipping cost growth at 3% a year, the value per Prime member is \$584.53. Extrapolating to 100 million members, the updated value at the end of 2017, that would yield a value of \$58.45 billion for existing members.

Valuing New Prime Members

To value new Prime members, we first calculate the value per Prime member, with an estimated cost of \$100 for acquiring a new member. Assuming that Amazon will continue to grow its Prime membership, we value the new Prime members in Figure 18:

Figure 18: Valuing Existing Amazon Prime Members

Cost of acquiring a new member is currently \$100											
Cost of acquiring new Member = \$ 100.00											
Value per new user (in today's \$) = \$484.53											
	Base Year	1	2	3	4	5	6	7	8	9	10
Total Prime Members	100.00	112.00	125.44	140.49	157.35	176.23	183.28	190.61	198.24	206.17	214.42
New Members	0.00	16.00	17.92	20.07	22.48	25.18	14.10	14.66	15.25	15.86	16.49
Value per new Member	\$484.53	\$494.22	\$504.11	\$514.19	\$524.47	\$534.96	\$545.66	\$556.57	\$567.71	\$579.06	\$590.64
Value added by new Members		\$7,908	\$9,034	\$10,320	\$11,790	\$13,468	\$7,693	\$8,161	\$8,657	\$9,183	\$9,742
Terminal Value (New Members)											\$79,087
Present Value		\$7,329	\$7,759	\$8,215	\$8,698	\$9,209	\$4,875	\$4,793	\$4,712	\$4,632	\$41,528
Value Added by New Users		\$101,750									
Discounted back at 7.90%, the cost of capital for Amazon today											

Value of new user = Value of Existing member- Cost of acquiring new member = \$584.53 - \$100), growing at inflation rate (2%) every year.

Net members grows 12% in yr 1-5 and 4% in years 6-10.

New members grows enough to cover non-renewals & growth.

User growth continues at riskfree rate in perpetuity.

Note the growth of 12% in net membership requires a growth of more than 12% in new members, to cover non-renewals of existing memberships. Beyond year 10, we assume that the growth rate in new members drops to 3% a year forever (set equal to the risk free rate in April 2018). The value of new Prime members, with these assumptions, is \$101.75 billion.

Valuing Corporate Cost Drag

As with the cost of adding a new user, estimating the corporate cost drag took some judgment calls, but the estimated after-tax expenses and the value effect are captured in Figure 19:

Figure 19: The Corporate Cost Drag at Amazon Prime

Technology & Content Costs										
Estimated that \$3,592 million is for Prime members										
Total Media & Content Costs \$ 22,620.00										
Amazon Prime Share of Expenses	15.88%									
Corporate Expenses	\$3,592	\$4,023	\$4,506	\$5,047	\$5,652	\$6,330	\$6,584	\$6,847	\$7,121	\$7,406
After-tax Corporate Expenses	\$3,198	\$3,560	\$3,962	\$4,409	\$4,906	\$5,069	\$5,238	\$5,412	\$5,591	\$5,776
Terminal Value (Corporate Exp)										\$121,421
PV of Corporate Expenses	\$2,964	\$3,057	\$3,154	\$3,252	\$3,354	\$3,212	\$3,076	\$2,946	\$2,820	\$59,466
Value Drag of Corporate Expenses	\$87,302									
Discounted back Amazon's cost of capital of 7.90%										

Grows with number of Prime Members

Grows at inflation rate forever.

Assuming that \$3,592 million is the content cost attributable to Prime in 2017, and that these costs grow with user count each year, the cost of the corporate drag is \$87.3 billion.

Valuing Amazon Prime

Bringing together the values of existing and new Prime members, and netting out the cost of corporate drag, we estimate the value of Amazon Prime in Table 3:

Table 3: Valuing Amazon Prime

Value of Existing Members	\$58,453
Value of New Members	\$101,750

- PV of Corporate Expenses	\$87,302
Value of Prime Membership	\$72,901

With the assumptions made, the value of Amazon Prime alone is \$72.9 billion, with potentially more upside than downside. To illustrate, Amazon announced an increase in Prime membership fees to \$119 from \$99, in the United States, right after this analysis was done. Incorporating this price increase, without changing the user growth assumptions, increases the value of Amazon Prime to over \$100 billion.

User Value Dynamics

One of the benefits of a user-based valuation is that, notwithstanding the many assumptions that it requires and the absence of key data on user metrics, it provides us with a framework that can be used to look at user dynamics, i.e., the key variables that separate more valuable user-based companies from less valuable ones. In this section, we use the Uber, Netflix and Amazon Prime valuations to examine these variables.

User Cost Propositions

Many young user-based companies lose money, not because they are user-based, but because they are still early in the life cycle. A few of these companies are publicly traded, like Snap, but most are private businesses funded by venture capitalists. While the reaction of most old-time value investors, looking at these companies, is to view them as overvalued fads, the lesson of the last decade has to be that some of these companies will come out of their growing pains as valuable companies. In this section, we will argue that to value a user-based company, you not only have to look at aggregate revenues and expenses, but also look at the reasons why the company is spending money, since there are good ways of losing money as well as bad ones.

Existing versus New User Costs

In keeping with our break down of the value of user-based companies into value from existing users and new users, we will argue that breaking down expenses into those associated with servicing existing subscribers and in getting new customers is critical to understanding their value. To see why, let us go back to the user-based valuation of Uber that we presented earlier in this paper. Using very rough judgments, we allocated Uber's operating costs to servicing existing subscribers and getting new ones and arrived at a value of \$31.5 billion for operating assets. In Table 4, we look at how the value of operating assets would change if we allocated less or more of the overall operating expenses to acquiring new users (with the rest going to servicing existing subscribers):

Table 4: Value of Uber Operating Assets – Cost allocated to New User Acquisitions

% of Current Operating Expenses spent on
--

<i>Acquiring New Users</i>	<i>Servicing Existing Users</i>	<i>Value of Existing Users</i>	<i>Value of New Users</i>	<i>Uber User Value</i>
0%	100%	\$ 6,167	\$ 18,147	\$ 24,314
20%	80%	\$ 10,619	\$ 19,035	\$ 29,654
40%	60%	\$ 15,071	\$ 19,923	\$ 34,994
60%	40%	\$ 19,523	\$ 20,811	\$ 40,334
80%	20%	\$ 23,974	\$ 21,699	\$ 45,673
100%	0%	\$ 28,426	\$ 22,587	\$ 51,013

Note that as the percent of current operating expenses spent on new user acquisition increases, not surprisingly, the value of existing users increases, but surprisingly, so does the value of new users. That is counter intuitive, since Uber is spending more on acquiring new user, but that effect is being offset by the value added by that new user. The overall value of the company is greatest when all of the operating expenses are going towards new user acquisition, and servicing existing users is costless.

User Value Proposition 1: A money-losing company that is losing money, providing service to existing users/subscribers, is worth less than a company with equivalent losses, where the primary expenses are coming from acquiring new subscribers.

Fixed versus Variable Costs

There is a second way to slice up costs and that is into fixed and variable costs. In other words, some of the operating expenses at a user-based company will scale up with users and some are fixed. Using Uber as an illustrative example again, we looked at the value of the company as a function of the proportion of Uber's costs that are fixed in table 5:

Table 5: Value of Uber Operating Assets – Fixed versus Variable Costs

<i>% of current expenses that are fixed</i>	<i>Value of Existing Users</i>	<i>Value of New Users</i>	<i>Uber User Value</i>
0%	\$ 14,733	\$ 15,250	\$ 29,983
20%	\$ 16,412	\$ 20,191	\$ 36,603
40%	\$ 17,834	\$ 24,373	\$ 42,207
60%	\$ 19,040	\$ 27,924	\$ 46,964
80%	\$ 20,068	\$ 30,949	\$ 51,017
100%	\$ 20,947	\$ 33,536	\$ 54,483

As the proportion of costs that are fixed goes up, the value of both existing and new users increases and the explanation is a simple one. It is the economies of scale, since as companies get larger, their fixed costs get to become smaller, as a percent of revenues.

User Value Proposition 2: A company whose expenses are primarily fixed (will not grow with revenues) will be worth more than an otherwise identical company whose expenses are variable (track revenues).

In our valuations of Uber, Netflix and Amazon Prime, the fixed costs show up both as service cost per user/subscriber and more often as corporate costs. With Netflix, for instance, we argued that much of the content cost is corporate cost, not directly related to subscriber count. In March 2018, we used the same user-based framework to value Spotify, another subscriber-based company built around music rather than video. While the Spotify model does look like Netflix, at least on the surface, it is different in one very important respect. Not only did Spotify not produce original content, at least in March 2018, but it also pays for content based upon how often a subscriber listens to a song, making its content cost not only user-linked, but variable. In Table 6, we examine the consequences for subscriber and company value, for the two companies:

Table 6: Netflix versus Spotify

	<i>Netflix</i>	<i>Spotify</i>
Number of Subscribers	117.6	71
Annual Revenue/Subscriber	\$ 113.16	\$ 77.63
Subscriber Service Expenses (as %)	18.90%	79.24%
CAGR in subscriber count	223.93%	369.86%
Value per Existing Subscriber	\$ 508.89	\$ 108.65
Cost of acquiring New Subscriber	\$ 111.01	\$ 27.30
Value per New Subscriber	\$ 397.88	\$ 81.35
Value of all Existing Subscribers	\$ 59,845.86	\$ 7,714.28
+ Value of all New Subscribers	\$ 137,276.49	\$ 20,764.56
- Corporate Cost Drag	\$ 111,251.70	\$ 13,139.75
=Value of Operating Assets	\$ 85,870.65	\$ 15,339.10

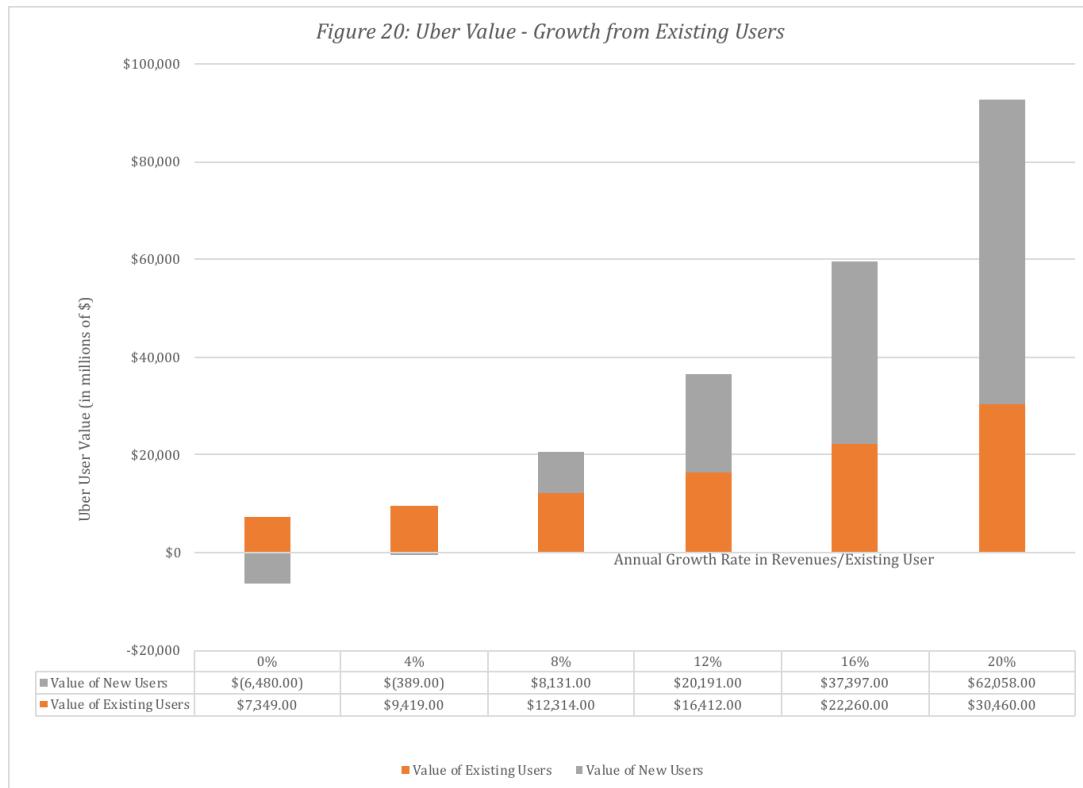
Spotify had fewer subscription-paying members when it went public, and each subscriber paid less, but the value difference between the two companies is widened by their different business models. Since content cost is connected to subscribers for Spotify, it generates far less in operating profit per subscriber, pushing down the value of both its existing and new subscribers.

User Growth Propositions

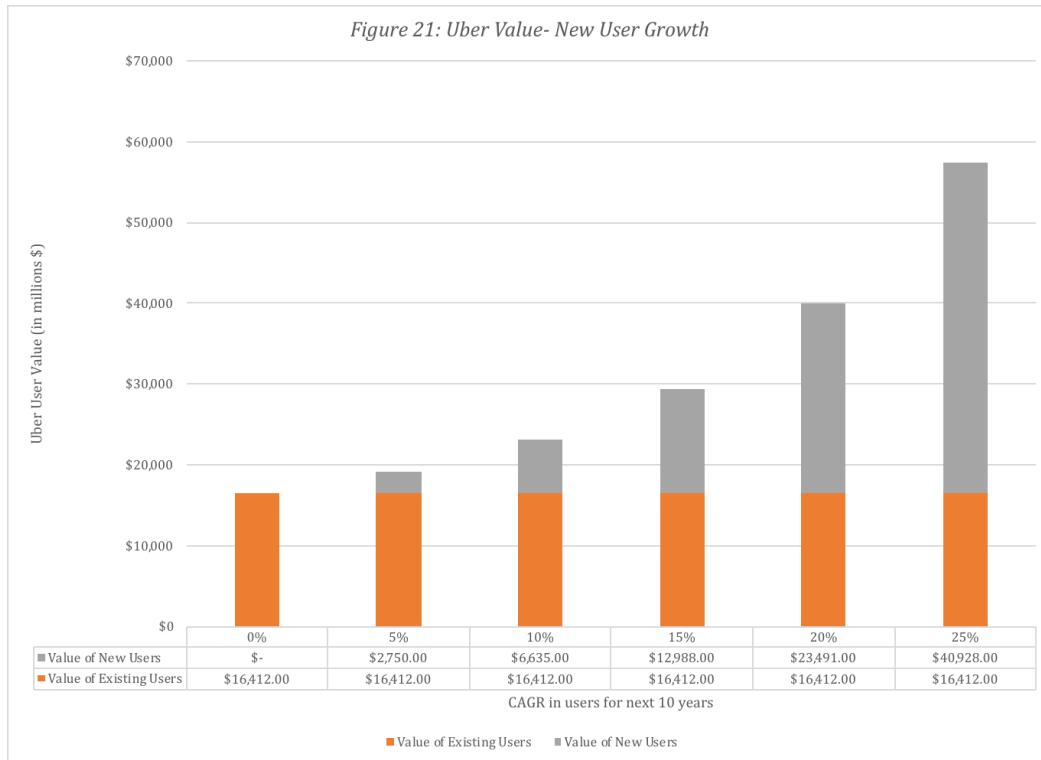
For young companies, we generally view growth as good and reward higher growth companies with higher valuations, but not all growth is created equal. Some growth strategies create more value than others and some may even destroy value. In a user or subscriber based model, there are two ways you can grow your revenues. One is to get existing users to buy more of your product or service or perhaps other

products and services that you come up with. The other is by trying to acquire new users.

To examine how each type of growth affects value, let's go back to the Uber user-based valuation, and look at the effects on value of changing the growth rate in transactions revenues per existing user first, in Figure 20:



Increasing the growth rate in revenues per user from 0% to 20% moves Uber from being a worthless company to one worth over \$62 billion. Now, look at the impact of changing the growth rate in the number of users, leaving existing user value intact, in Figure 21:



While value increases with growth in new users as well, the effect is much less dramatic. The total value of Uber is more sensitive to the growth rate in revenues per existing user than it is to growth rate in users, leading to our third user value proposition.

User Value Proposition 3: A company that is growing revenues by increasing revenues per user is worth more than an otherwise similar growth company that is deriving growth from increasing the number of users/subscribers.

Young companies face trade-offs and the question of whether to allocate resources to get new users or try to sell more to existing users is one of those. At least in the case of Uber, the numbers seem to indicate that if you have to prioritize these goals, the top priority should be to get existing users to use the service more than to keep looking for new users. More generally, this may explain why some companies choose transaction-based models over subscription-based models, since there is more potential for increasing revenues per user in the former than the latter. Netflix, a purely subscription-based model, has to get much of its growth from increasing subscribers, but Amazon's hybrid model, where a portion of the revenue comes from Prime members spending more has greater upside from existing members.

User Business Propositions

Looking at a company as a user or subscriber based company can be useful in deciphering how and why they make the strategic and business choices that they do. In this section, we will lay out the framework for separating great user-based

companies from just good ones, and good user-based companies from mediocre ones, and then use that framework to make sense of some of the buzzwords that increasingly percolate through business, such as *networking benefits*, *big data* and even *real options*.

The Good, the Bad and the Ugly

If you adopt the user-based framework, the value of a user-based company, comes from the combination of existing user value and new user value. Holding all else constant, you would like to be able to have a business model where an existing user has a very high value and it costs you little to add new users. In the real world, those two phenomena generally don't go together, since the features of the business that allow you to add new users at low cost usually allow your competitors to do the same. As a consequence, they can go after your customers, causing renewal rates and cash flows per user to drop, and with them, the value per existing user. To succeed when both the value per user and the cost per acquiring new users are low, you need a model with lots of users. Conversely, you could live with an "exclusive user" model, where you have relatively few users that deliver high value per user and the cost of acquiring users is very high as well, though much of your growth will then have to come from selling more to your existing users. There is one combination, though, that is deadly for value and that is if you have existing users of low value but your costs of acquiring new users is high. Table 7 captures the combinations of existing user value and cost per user and the resulting business consequences:

Table 7: Existing User Value/New User Acquisition Costs

	<i>Cost of New User: High</i>	<i>Cost of New User: Low</i>
<i>Existing User Value: High</i>	Exclusive user business: Companies will focus on getting highest value users, keeping them and selling them more.	The Value Stars: These are the value stars of the user business, and they have strong competitive advantages (that allow them to keep the cost of acquiring new users low).
<i>Existing User Value: Low</i>	Disasters: These companies may have lots of users, but they will continually lose money, even as they grow.	Commoditized user business: Companies with the most users will win and have higher value.

This framework is useful in understanding what makes some user-based companies stand apart as stars. These companies draw on their competitive advantages to lower their customer acquisition costs while keeping customer value high. They remain the exception, not the rule.

Network Benefits and Big Data

Corporate strategists are fond of buzzwords and in today's technology companies, we hear talk of network benefits that accrue to companies in many technology businesses, where it gets easier for these companies to grow as they scale up, instead of getting more difficult, as was the case with old technology companies. In the

context of user-based companies, this manifests itself in the two dimensions we highlighted in the table below, by increasing the value of existing users and simultaneously lowering the cost of acquiring new users.

We are increasingly hearing about the possibilities of big data, and here again, a user-based model can help explain how big data can play out to the advantage of some user-based companies. These companies can use the data that they collect from us, often in the process of using their products, not only to make us more attached to their services (increasing renewal rates and the value of existing users) but to target new users (reducing the cost of acquiring new users).

If you look at the most successful user/subscriber based companies, and we would include Google, Facebook, Netflix and perhaps even Amazon in that mix, it seems to us that they have used both networking benefits and big data better than perhaps any other companies in history. Google and Facebook not only have dominant market shares of the online advertising business but are increasing those shares by claiming larger and larger slices of the growth pie each year.¹⁰ Netflix has been able to increase its subscriber count significantly each year for the last five years, even as it has scaled up, and it can be argued that the data it collects on the viewing preferences of its subscribers is helping it move towards becoming a star user company, with high value per existing subscriber and low user acquisition costs.

Revenue Models

Earlier in the paper, we looked at three different business models that user and subscriber-based companies can adopt: advertising, transaction and subscription-based. To understand how these models play out in value, let us consider how they vary on key value drivers in table 8:

Table 8: User/Subscriber Revenue Models

<i>Value Driver</i>	<i>Subscription</i>	<i>Transaction</i>	<i>Advertising</i>
<i>User Stickiness (User life & Renewal Probability)</i>	High (High life & renewal probability)	Intermediate (Intermediate life & renewal probability)	Low (Low life & renewal probability)
<i>Revenue per User Predictability (Discount rate)</i>	High (Low Discount Rate)	Low Predictability (High Discount Rate)	Intermediate (Average Discount Rate)

¹⁰ Google and Facebook, which have a market share of close to 60% of the overall online advertising market, together accounted for almost 80% of the growth in the online advertising business in 2017.

<i>Revenue per User Growth (Annual Growth Rate)</i>	Low (Low growth rate in revenues/user)	Low (High growth rate in revenues/user)	Intermediate (Intermediate growth rate in revenues/user)
<i>Growth rate in users (CAGR in # Users)</i>	Low (Low CAGR in # users)	Intermediate (Intermediate CAGR in # users)	High (High CAGR in # users)
<i>Cost of adding new users (Cost/New User)</i>	High (High Cost/New User)	Intermediate (Middling Cost/New User)	Low (Low Cost/New User)

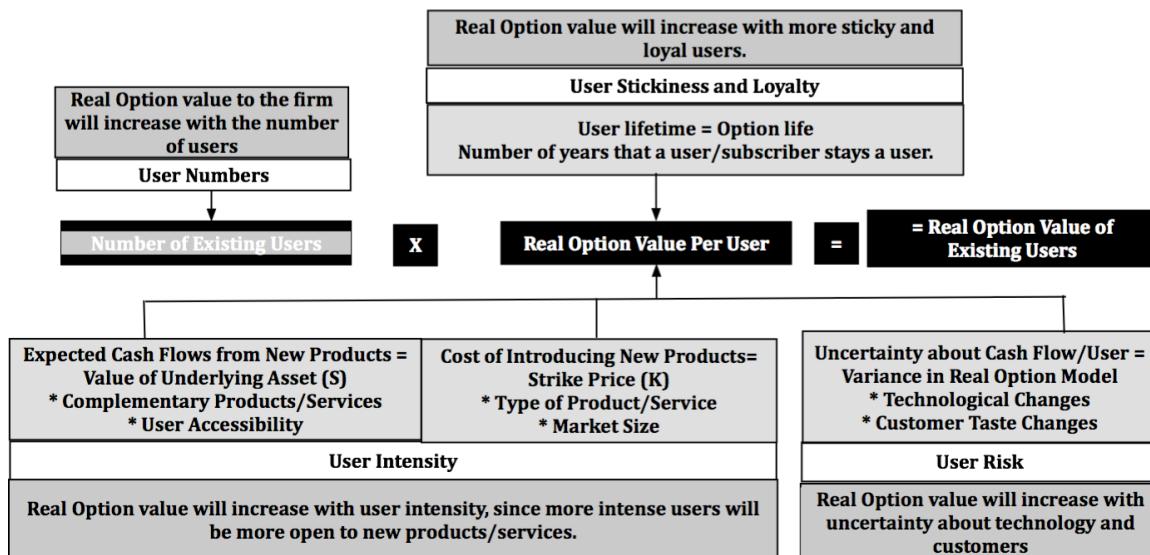
An advertising-based model will allow for much more rapid growth in a firm's early years, a subscription-based model will generate more sustainable growth and a transaction-based model has the greatest potential for revenue growth from existing users.

User Value Proposition 4: The "optimal" revenue model will vary across firms depending upon where they are in the life cycle, the product or service offering and whether they are focused on user growth, revenue growth or revenue sustainability.

Real Options

Does a company with a large and loyal customer user base have optionality (leading to a premium being added to its value)? While real options are notoriously difficult to value, in this context, a user focus can give us direction and figure 22 lays out the structure.

Figure 22: Optionality in User Base



The value of a real option comes from exclusivity, and to the extent that you have

sticky, intense users, you have a customer base that you can use to experiment with other products and services, whose value scales up with the number of uses.

User Value Proposition 5: The value of optionality from a user base will be greatest at firms with lots of sticky, intense users in businesses where the future is unpredictable because of changes in product/service technology and customer tastes.

To understand how a real options argument will play out with a user-based company, consider Facebook and Amazon Prime. Facebook has 2.2 billion intense users but it currently makes almost all of its revenues from advertising. However, given that these users are in the Facebook ecosystem for more than an hour each day, consider the possibilities. Facebook could sell entertainment or offer retail products and services, if it believes that there is profit potential. With Amazon Prime, the potential upside of having 100 million Prime members, who have developed a loyalty to Amazon based upon numerous past interactions with it, at the company's beck and call is the equivalent of having an army to back Amazon's disruption platform in almost any business it chooses to target, from Paypal in payment processing to CVS in prescription drugs. In contrast, we would argue that the Netflix model has less potential upside in terms of other products and services that the company can sell subscribers.

Pricing Users, Subscribers and Members

Much of financial analysis and investment is built around pricing, not intrinsic value, with analysts comparing standardized prices or multiples across companies in a peer group, to determine which ones are cheap or expensive, on a relative basis. Since many of these pricing comparisons are done across established, profitable companies, it should come as no surprise that the most commonly used multiples look at market price (of either the equity or the enterprise value) as a multiple of earnings (PE, EV to EBIT), cash flow (EV to EBITDA) or book value. With young companies, reporting losses, the fall back has generally been a revenue multiple, but when a company's primary talking point is that it has a multitude of users or subscribers, but little in the form of revenues or earnings, it should come as no surprise that analysts have started scaling market value to the number of users or subscribers to make their investment judgments.

Naive Pricing

While there is nothing fundamentally wrong, in a pricing world, in comparing price/user or EV/subscriber across companies, our discussion of what drives the value of a user/subscriber based company should provide us with the insight into the ways in which we can be misled by price per user numbers. Just to provide two quick examples:

- User Growth: All user-based numbers divide the current market value by the existing number of users. However, the market value is reflective not just of the existing users but also new users that the market expects the company to

acquire in future years. Holding all else constant, we should expect companies that expect less user number growth in the future to trade at lower multiples of the existing user base.

- User Intensity/Involvement: Not all existing users are alike, in terms of value added. A company that has more intense users that it can tap into to generate more revenues from should trade at a higher price per user than one with less intense users.

Earlier in the chapter, we also pointed to different revenue models, ranging from advertising to subscription to transaction, and how each revenue model delivers a different combination of user revenues, risk and growth. If you are comparing user-based companies, with different revenue models, in a peer group, you should be cautious about picking companies purely based upon price or enterprise value per user.

Controlled Pricing

One of the side benefits of going through the process of valuing a user is that it provides a framework for assessing why user values should vary across companies. It can therefore be an invaluable addendum to a pricing analysis, where instead of comparing price per user across companies, you controlled for differences across companies, using proxies to measure the variables that should cause the pricing to vary.

Table 9 summarizes the variables, largely based upon the value framework in the last section, and what you could use to measure these variables. (Note that the price/user in this table refers to the market capitalization of the company divided by the number of users and is a pricing metric)

Table 9: User Pricing Implications

<i>Variable</i>	<i>Pricing Implication</i>	<i>Information Proxy</i>
User Stickiness (Lifetime & Renewal)	More sticky users -> Higher Price/User	User renewal rates
User Intensity (Current Cashflow)	More intense users -> Higher Price/User	User time/usage of platform
User Interest (Growth in Cash flow)	More interested users -> Higher Price/user	Number & Value of transactions/user & Revenue Model
User Risk (Uncertainty about Cash flow)	More uncertainty -> Lower Price/user	Revenue Model (Subscription models are less risky than transaction models)
Cost of adding new user	Higher cost -> Lower Price/user	Cost of adding a new user
Growth in number of new users	Higher user growth -> Higher Price/user	Number of new users added

Corporate Drag	Higher Drag -> Effect on Price/user uncertain (higher value from growth but also higher risk)	Corporate costs unrelated to users as percent of total cost
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Using this table, you can quickly see why the price per user at Facebook will be substantially higher than the price per user at Twitter, as the former has more loyal and intense users, and why the price per user at Blue Apron plummeted when Amazon acquired Whole Foods, as investors reassessed user growth and costs at the company, now that Amazon is a competitor. Here again, you might take issue with the fact that doing pricing right requires you to have information on user characteristics that are either not provided or provided sporadically. Our perspective is that, if you are an analyst or investor, these are the parameters that you should be questioning managers on, and if you are a regulator or an accounting rule writer, this is the type of information that should be part of every user-based company's public disclosure.

Application 4: Pricing Spotify

In March 2018, Spotify announced that it would become a publicly listed company. Analysts and investors wrestling with how best to price the company quickly converged on two choices:

- Comparison Companies: Given Spotify's business model of streaming music to subscribers and collecting both subscription premiums and advertising revenues (from their free subscriber streams), the two companies that were public and had the same business model were Pandora, another audio streaming company, and Netflix.
- Standardizing Variable: Given that Spotify and Pandora were reporting operating losses, analysts had three choices when it came to pricing metrics: revenues, gross profits and number of subscribers, and Table 10 summarizes the values of each of these for the three companies in March 2018:

Table 10: Spotify, Netflix and Pandora – Key Numbers

	<i>Enterprise Value (millions US \$)</i>	<i># Users (millions)</i>	<i># Premium Subscribers (millions)</i>	<i>Revenues (millions \$)</i>	<i>% from Ads</i>	<i>Gross Profit (millions \$)</i>
Pandora	\$ 1,135	74.70	5.50	\$ 1,467	73.28%	\$ 500
Netflix	\$ 137,462	117.60	118.00	\$ 11,693	0%	\$ 4,033
Spotify	NA	159.00	71.00	\$ 5,049	10.17%	\$ 1,048

In Table 11, we use the market values of Pandora and Netflix to derive pricing metrics for these questions and use these pricing metrics to derive imputed prices for Spotify:

Table 11: Pricing Metrics – Pricing Spotify

	Pricing Multiple	Pricing Spotify
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	<i>EV/ User</i>	<i>EV/ Revenue</i>	<i>EV/ Gross Profit</i>	<i>Users</i>	<i>Revenues</i>	<i>Gross Profit</i>
Pandora	15.19	0.77	2.27	\$ 2,416	\$ 3,906	\$ 2,379
Netflix	1164.93	11.76	34.08	\$ 185,224	\$ 59,356	\$ 35,720

Applying Netflix's enterprise value per user of \$1165 to Spotify's 159 million users yields an absurdly high valuation of \$185.2 billion for Spotify's operating assets. Even applied only to Spotify's 71 million premium users, you still get almost \$88 billion. Using the analysis in Table 9, we would argue that you would need to adjust Netflix's enterprise value per user downwards to reflect the fact that Spotify's content costs are user-related and variable, reducing the value of a user, as shown in Table 6. In that table, we value a Spotify subscriber (\$108.65) at about a fifth of the value that we give a Netflix subscriber (\$508.89). Applying that adjustment to Spotify, we get the following:

Spotify's Operating Asset Pricing = $71 * \$1164.93 * (108.65/508.89) = \$17,659$ million

There are additional adjustments you can make for Spotify's higher growth and lower corporate cost drag, but they will be relatively small ones.

Applying Pandora's pricing metrics to Spotify's subscribers yields absurdly low numbers but that is because, while they look similar on the surface, they have very different business models. Pandora derives 73% of its revenues from advertising and less than 10% of its subscribers are paying. Not surprisingly, its enterprise value per user is much lower than Spotify's and any further comparisons become moot.

The differences between Pandora, Spotify and Netflix were large, but that did not stop the naïve pricing in financial markets. Investors who were bullish on Spotify actively promoted the comparison to Netflix, because it justified paying a higher price for Spotify shares. Investors who were bearish on the stock were more inclined to use the Pandora comparison to back their contention that Spotify was not worth very much. They were both wrong.

General Lessons

If you are skeptical about the leaps of faith and the assumptions used in this paper to value user and subscriber-based companies, we don't blame you. While we share your doubt about key numbers, we would argue that if anything, they point to why we need to push companies that are using their ever-growing users and subscribers as the basis for higher valuation should be held accountable for that dependence and asked to provide more user-based information. Some companies like Overstock, Sirius XM and Dish Network already are providing much more detail about their subscriber and user bases, and it is time that we put pressure on other companies to follow the lead.

If you are a venture capitalist or investor being asked to put your money in a user or subscriber-based company, you have the power to ask for that information, before

you invest. In appendix 1, we have developed a very preliminary list of questions, developed using the framework in this paper, that you may want answered.

If you are an investor in a publicly traded company, you don't have the same power, as venture capitalists possess, to extract information from the managers. At the same time, we believe that information disclosure requirements for user and subscriber based companies should require that companies provide answers to the questions in appendix 1, as part of their financial statements.

Even if you do get access to user-level data, you will be well served to not just trust your investment judgments to just a user-based valuation, but to cross check it with a top-down valuation, as we did for Uber. If the values that you derive are very different, you should try to isolate the inputs that are the cause and think about which approach is making the more reasonable assumptions for the future.

Conclusion

In this paper, we looked at what we term disaggregated valuation, where we value companies in pieces. While this mostly takes the form of valuing divisions or individual businesses of multi-business, multinational companies, we looked at user, subscriber and customer based companies where the focus in both valuation and pricing has been on the users. We argued that intrinsic valuation models can be adapted to value both existing and new users in a company and through those values, you can extract the value of a user-based company. We then used the insights from those valuation models to examine how we can price users at companies, listing the variables that may cause this price to vary across companies.

Appendix 1: Questions for a User, Subscriber or Member-based Business

<i>Question</i>	<i>To Estimate</i>
1. How many users/subscribers do you have today?	Base Number for count
2. How many users/subscribers did you have a year ago? How many of those users/subscribers are still active? (If user data is available on a quarterly or monthly basis, even better!)	User Growth & Renewal Rate
3. How much is your service built on a technology and what is the life of that technology?	Life of a user
4. What revenue model do you have for making money off your users/subscribers? (Advertising, Transaction, Subscription or Hybrid)	Growth and Risk (Cost of Capital)
5. How much did you generate in revenues in the most recent twelve months?	Revenues/subscriber
6. Are there competitors? What is your competitive sales pitch?	Renewal Rate, Growth in Revenues/Subscriber
7. How much did you have as operating expenses in the last twelve months?	Aggregate profit/loss & survival risk
8. How much of these operating expenses are related to servicing existing users? What proportion of these are fixed?	Value of existing subscriber
9. How much of these operating expenses are related to acquiring new users?	Cost of acquiring new user
10. How much of these operating expenses are not related to existing or new users? What are the possibilities of economies of scale	Corporate Cost Drag
11. As you get larger, is it getting easier or harder to add new users?	Networking benefits
12. What other products or services, if any, can you market to your user base?	Real Options