



Investment Thesis

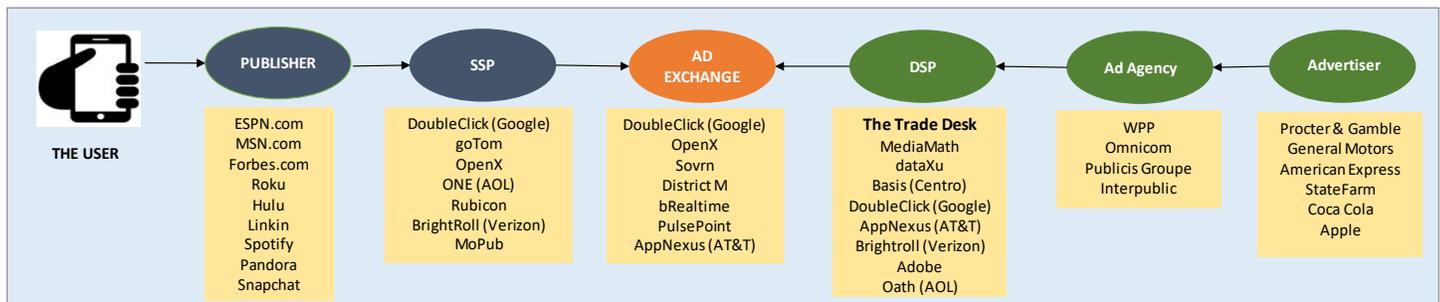
- The Trade Desk is a global tech company that enables ad buyers to purchase and manage data-driven digital advertising campaigns through a self-service omnichannel software platform.
- They are the largest independent demand side platform (DSP) helping provide ad price discovery for agencies.
- It has a large addressable market in a high growth industry and takes nominal capital to grow.
- Increasing barriers to entry such as scale, customer stickiness, and being an independent platform not affiliated with a larger media company, contribute to The Trade Desk's moat.
- Long-term outlook and cash flow potential make current valuation look very attractive.

History of Ad Tech

Following the rise and fall of companies such as Rocket Fuel and Rubicon, Wall Street and Silicon Valley have generally disliked the digital advertising space. However, the digital advertising industry is fairly complex with many different players with different qualities and when a whole industry gets thrown out with the bathwater, it potentially leads to some misvalued opportunities. We are sure few readers have ever really cared to know the complex and esoteric inner workings of the digital ad world, but some background will prove helpful in understanding The Trade Desk.

In the early days of the internet, advertisers bought media/advertisements through agencies. Publishers such as forbes.com, msn.com, or some blog owned impressions/ad space called inventory where marketers wanted to advertise to potential users of their product or service. Inventory was sold to marketers manually, at a set rate per a thousand impressions which depended on the type and quality of the inventory. As the internet grew, there were eventually billions of impressions to sell with varying types of inventory quality. Transparency became an issue with advertisers not knowing where their ads were being placed and publishers not knowing who was buying their inventory. Ad exchanges emerged to help trade inventory in an auction-based model where advertisers could bid on varying qualities of inventory and more specific audiences. This led to advertisers use trading desks or demand-side platforms to carry out the bidding directly with ad exchanges and publishers doing the same thing with supply-side platforms to sell inventory.

Overview of Ad Tech Players



1. Users: The end consumer/customer that navigates/browses the internet and other digital media.
2. Publishers: Sellers of inventory. They own the media/web pages and generate the content or inventory that reaches users.
3. Supply Side Platform (SSP): Allow publishers to access demand from ad exchanges to sell their inventory.
4. Ad Exchange: A marketplace that enables advertisers and publishers to buy and sell ad space.
5. Demand Side Platform (DSP): Allow advertising clients to buy digital media from an ad exchange, through a single interface.
6. Advertisers: Buyers of inventory (often through ad agencies) who want to reach the user by placing ads on the publisher's inventory.

Founding of The Trade Desk

Jeff Green, the founder and CEO of The Trade Desk, helped pioneer the ad tech industry. He was a digital media buyer at an ad agency in the early 2000's where he discovered his passion for digital advertising. He believed advertising could be done more effectively than the traditional "spray and pray" model by using data. In 2003 he started AdECN, the world's first online ad exchange where media publishers could sell their inventory directly to ad agencies, functioning like a stock market for ads. Microsoft acquired AdECN in 2007 where Green lead the group until deciding to leave in 2009 to start The Trade Desk.

His goal was to create a platform where advertisers could value media inventory through data-driven decisions. With the ability to buy and sell advertising inventory electronically or programmatically, advertisers could use data to make better decisions on what, when, and whom to show an ad impression. Historically most advertising inventory was sold in bundles or blocks based on a set price with limited targeting, customization, or attribution. For example, with broadcast TV, ads could only target a specific network, program, or geography, but not a single household or individual. If every ad impression is worth something different to every advertiser,

they should be transacted and valued separately. With the rise of the internet and now programmatic advertising, ads can be digitally delivered on a 1-to-1 basis.

Competition: Where others have failed, The Trade Desk prospers

As expected, a lot of capital was invested and numerous companies were started to take advantage of the emerging ad tech opportunity. Many companies that served as an advertising trading platform have failed for various reasons.

Platforms offered little transparency. Ad trading platforms make money by charging a spread, or take rate. They buy ad impressions from a media company for perhaps \$0.85 and then would charge \$1.00 to their advertising customer, providing a 15% take rate. Some companies served as both a demand side and a supply side platform which created a conflict of interest between buying inventory for advertisers and selling inventory for publishers. Companies would charge a take rate that was unsustainably high, sometimes approaching 40%-50%.

Other platforms used decision tree/line item queries when analyzing inventory for advertisers. An advertiser will input certain variables into a DSP's platform in an effort to reach their target market, such as males, age 10-15, interested in video games. The process utilizing line item permutations become exponentially complex when adding each additional variable to target users. Not only was the process highly manual and unmanageable for marketers, it took an unscalable amount of memory (RAM), increasing operating costs to pay for the data storage.

The Chief Technology Officer and co-founder Dave Pickles saw the inefficiency of using decision tree line items and created a system called bid factoring. Bid factoring is essentially a linear equation that enables marketers to apply multipliers to different targeting parameters. This approach makes it easier to value each user individually and dynamically, allowing marketers to more easily reach their target users. Bid factoring saved time for marketers through automation and removed the need to store tons of line item permutations, therefore lowering data storage costs.

When Green started The Trade Desk his goal was to "build a company for the next 100 years." He did not want to follow the same mistakes that other companies in the space made such as having a conflict of interest by being on both the buy and sell side. Green decided to build a demand side platform because he believed the demand side of the advertising transaction will always have the advantage. In advertising it will always be a buyer's market because it is easy to add supply by having an extra impression on a web page or additional 30 second spot to a commercial break to meet increased demand. This basic economic reality means advertising supply is more elastic than demand and will forever put the buy side in the power position.

The Trade Desk would also be transparent and not charge unsustainable take rates. Green believed once the digital advertising industry matures, total transaction costs to purchase a digital ad would be \$0.20-\$0.30 for every \$1.00 spent, with roughly \$0.15-\$0.20 going to the DSP and \$0.05-\$0.10 being split between the SSP and the ad exchange. The Trade Desk could have charged much higher take rates but decided to charge customers what it believed would be the fair end-state price for their services. While take rates could become lower as competition potentially increases similar to what happened with discount stock brokerages, barriers to entry discussed below and the DSP's ability to provide increasing value to advertisers overtime should preserve prices.

Are there barriers to entry?

It's rare to find a fairly young company in a high growth industry with barriers to entry. The Trade Desk has developed a business that is scalable, takes nominal capital to grow, and is very difficult for any new competitors to enter the field.

Economies of scale. There is high operating leverage in the DSP cost structure meaning scale is important. Every time someone lands on a web page or connected device, millions of auctions occur in 1/10 of a second in order to sell the ad space. When a DSP runs an ad campaign for a customer, they plug into an ad exchange where SSPs make their inventory available. The DSP "looks" at the inventory, analyzes the impressions, and places bids on the auction. Every time a DSP looks at an auction it costs them money and every time an SSP sends an impression to a DSP it costs them money. Both parties only get paid if the auction is monetized. As the ad market has grown, the number of auctions have increased exponentially. In order for a DSP to win an auction, it now takes many more looks. For each ad campaign, costs have increased while revenues remained fairly flat, increasing operating leverage. DSPs that have half the ad spend as The Trade Desk will struggle because they will incur the same amount of expense per an ad campaign but monetize less making it much more difficult to be profitable if you are a smaller player and don't have the scale.

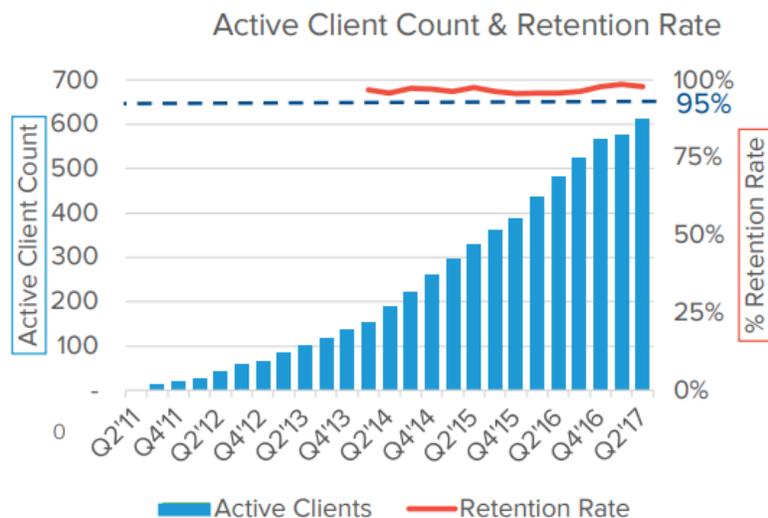
SSPs also do not send every impression to every possible bidder/DSP because every new bidder will cost them more money. They want to send impressions to DSPs that will likely win the auction so they can control expenses. If a DSP is getting fewer looks sent to them, they have less inventory to choose from, which lowers the potential quality of inventory they can provide to the advertiser.

Additionally, agencies/advertisers do not want to log into dozens of different platforms to buy digital advertising, preferring one platform with all available inventory to run campaigns. These simple operating characteristics create a huge disadvantage for smaller DSPs and makes it nearly impossible for a new player to become competitive against the larger, more established companies like The Trade Desk.

Customer stickiness/switching costs. There are several similarities between Wall Street and the inner workings of the ad tech trading world. In Wall Street there are stock exchanges, brokers, money managers, and research analysts. We think the Wall Street equivalent for The Trade Desk is Bloomberg, the difference being analysts pay a terminal subscription fee for Bloomberg and The Trade Desk earns revenue by taking a spread on the ad inventory purchased. The similarity is The Trade Desk provides a platform, or terminal, for the agencies/advertisers to analyze data and value inventory/securities.

Everyday The Trade Desk's customers log into their platform to use the data and analysis to value ad inventory and run marketing campaigns. Advertisers provide their customer data and publishers provide their user data which The Trade Desk uses to help advertisers value media for their specific needs. As The Trade Desk accumulates more data over time, their insight and analysis add more value to their customers, creating a self-reinforcing virtuous cycle.

To get an idea of customer stickiness, The Trade Desk has consistently maintained over a 95% client retention rate. It is pretty clear from client reviews online that The Trade Desk provides a valuable and highly rated service to their customers.



Source: 2017 Investor Day Presentation

Objectivity as an independent DSP. Largely reflecting the significant economies of scale described above, DSP consolidation is expected to continue. The number of DSPs continues to decline with only a handful of them being independent.

Previously independent DSPs such as AppNexus, BrightRoll, or DoubleClick have been acquired by larger media companies. There is an inherent conflict of interest when an advertiser uses Google's DSP DoubleClick or Verizon's Brightroll. For example, Google's primary business model is monetizing their media buy selling ad inventory on google.com and youtube to marketers. They are biased towards selling their inventory over competitor's inventory, not to

mention any company that directly competes with a Google, AT&T, or Verizon will likely be reluctant to share their customer data.

We expect the buy side to continue to consolidate over time, resulting in only a token few major players and at least one of them being an objective independent DSP. As the largest independent DSP today, we think The Trade Desk is favorably positioned to benefit from these industry trends.

What about Google and Facebook? – Walled Gardens

The Trade Desk does not directly compete with Google or Facebook. While Google does have its own version of a DSP, their core businesses is generating revenue from selling ads by monetizing their media inventory. Google and Facebook essentially dominate the digital ad space with an estimated U.S. digital ad market share of nearly 60% between the two of them. Because they have access to so many users and their data, they believe it is to their advantage to operate in what is called a “walled garden”. A walled garden is a closed off ecosystem, where outside platforms cannot access their inventory or data. If you want to advertise on Facebook or YouTube, you must buy inventory through Facebook and they do not provide data to help value their inventory.

Walled Gardens don’t enable ad buyers to value siloed inventory on a relative basis to other inventory outside of the walled garden. The Trade Desk takes more of a free market view to. They believe that reducing buyer’s access to inventory will decrease demand and therefore lower the potential selling price of the inventory within a walled garden. Google and Facebook are able to maintain their walled gardens because they are big enough today that advertisers have relatively few alternative options to reach their target markets. However, as the rest of the internet becomes more accessible and aggregated through platforms like The Trade Desk, advertisers will have increasingly better opportunities to access users.

One of The Trade Desk’s five-year goals is to have a larger user footprint than any other single company’s login footprint. For reference, Facebook currently has 2.2 billion monthly active users, or over half of the 4 billion people in the world with internet access. While billions of users do not log into thetradedesk.com, The Trade Desk has access to advertisers’ client data and publisher’s client data which aggregates to create a user footprint that will likely surpass any other single company. Green predicts that by enabling real price discovery on the rest of the internet, walled gardens will eventually feel enough economic pressure to come down and all advertising will get accessed and purchased on a relative basis instead of in walled off silos.

Is data privacy an issue?

The internet generally works by publishers providing interesting content to consumers for free in exchange for their data. Consumer data is then used to target advertisements that fund the “free”

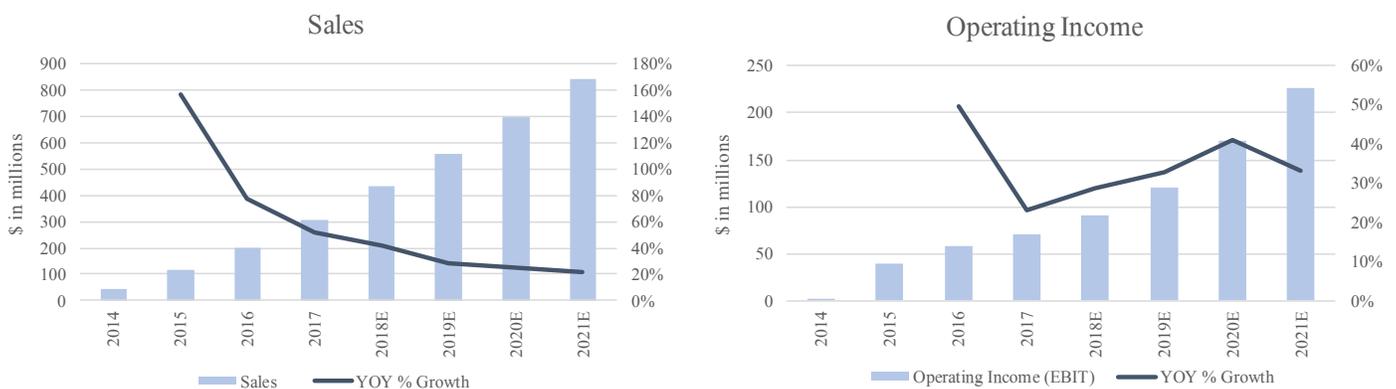
content. Rightfully so, consumers have become increasingly concerned about how their data is collected and used. The recent Facebook data scandal was related to an outside party that found a way to take directly identifiable data out of Facebook’s platform and use it in a way Facebook never intended. Unlike social networks, The Trade Desk does need personally identifiable information such as emails, phone numbers, credit card numbers, or social security numbers, to target advertising effectively. This data is not allowed on their platform, therefore a similar scandal cannot occur and they do not have the same data regulatory risks as a Facebook, Google, or Equifax.

Valuation

While shares have increased since our average purchase price of \$50, we still think The Trade Desk offers a very attractive investment over the long-term.

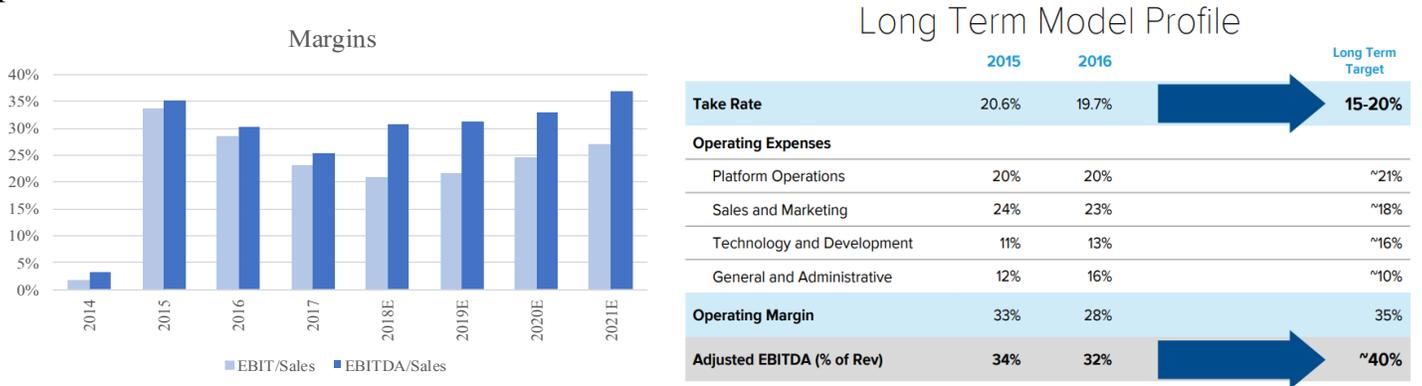
Unlike almost every other young, high growth software company that went public in recent years, The Trade Desk actually makes money. The company officially launched their platform in 2011 and has been profitable since 2012. The charts below show historic results since 2014 and consensus estimates through 2021. While we only consider consensus estimates with a grain of salt, it helps frame Wall Street’s expectations.

In 2017, sales and operating income grew 52% and 23% respectively and are expected to grow 42% and 29% in 2018. Sales growth is expected to slow to about a 20% rate which is inline with expectations for programmatic advertising growth in upcoming years. If programmatic advertising continues to grow at a 20% rate, and The Trade Desk benefits from consolidation in the DSP space, we would expect them to grow at a fast rate, meaning growth expectations may be conservative.



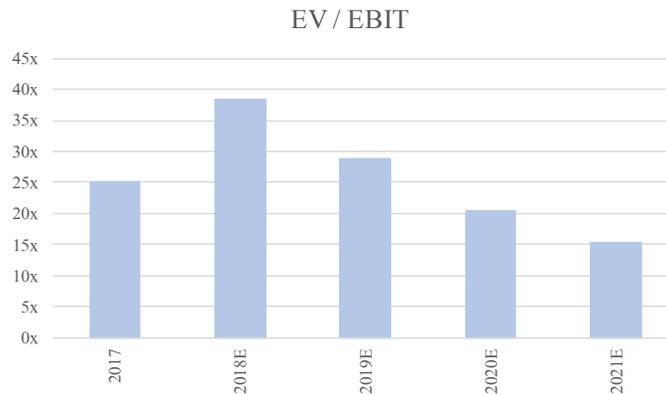
Source: Company filings, Factset Research Systems

One of the company’s 5-year goals is to reach EBITDA margins of 40% as it continues to benefit from scale. Take rates are expected to remain within historical ranges of 15%-20%, while sales and marketing expense and general/administrative costs should decrease as a percent of sales.



Source: Company filings, 2017 Investor Day Presentation, Factset Research Systems

Based on current consensus estimates, which assume sales and operating income grow at 25% and 35% rates respectively, The Trade Desk is selling for 38x 2018 EV/EBIT and 15x 2021 EV/EBIT. Operating income could be considered understated because none of the technology & development expense is capitalized.



Source: Company filings, Factset Research Systems

When valuing a high growth company with barriers to entry like The Trade Desk, current and near-term fundamentals are poor proxies for future earnings power and valuation metrics. This is contrary to how most “value investors” think, however we think The Trade Desk’s qualitative characteristics make it look very attractive.

What will the advertising industry look like in 10 years? According to International Data Corporation (IDC), global ad spend was estimated to be ~\$677 billion in 2017 and is expected to grow mid-single digits, reaching \$1 trillion over the next ten years. Global digital ad spend was \$229 billion in 2017 and is expected to compound at a 12% rate to reach \$360 billion by 2021 or comprise nearly half of total global ad spend. While programmatic advertising currently makes

up a relatively small part of the total advertising pie, it is not unreasonable to expect all digital advertising to ultimately be delivered programmatically.

One overly optimistic scenario would be global ad spend reaches \$1 trillion in 10 years and three quarters of global ad spend is digital and purchased programmatically. If there are four to seven DSPs that evenly split the market share of \$750 billion programmatic ad spend, \$110B-\$190B will go through one DSP platform. If the take rate is 15%-20%, revenues would be \$16-\$38 billion, with EBITDA margins of 35%-40% providing \$6-\$15 billion. Putting a reasonable multiple on the potential \$6-\$15 billion in EBITDA would indicate a lot of upside to Trade Desk's current \$3.5 billion market cap over a 10-year period.

Several important variables would have to work out in The Trade Desk's favor for the above scenario to actually occur and there is a lot of uncertainty looking out 10 years in a high growth industry. What we do know is The Trade Desk is the largest independent demand side platform, providing a highly-rated and valued service to its clients. It has a large addressable market, takes nominal capital to grow, and has signs of increasing barriers to entry. We think The Trade Desk is a high-quality company with the potential to compound cash flow at high rates for many years.

Risks

Technological Disruption: While there are barriers to entry to the existing DSP platform, an unknown technological change or new/unknown method to purchase digital ads could disrupt TTD's operating model. It's difficult to know the durability of a business model that is fairly young and in a high growth phase.

Large media companies: While we think being an independent DSP is an advantage, large media competitors such as Google and Facebook do have much greater capital resources if they did decide to more directly compete as a demand side platform which could hurt TTD's prospects. While this is a real risk, we believe there is a competitive advantage to being an independent DSP and strong probability at least one large independent will exist such as The Trade Desk.

Government regulation: TTD uses anonymous data that is not personally identifiable to individuals, so it does not have the same data privacy risks as companies with sensitive and personally identifiable information. The company does collect, analyze, and use data collected through cookies and similar technologies which is governed by governments. If regulations restricted the ability to collect such data, it could hurt the value proposition TTD provides to its customers which could likely hurt profitability.

Ad agencies business model weakens/changes: TTD's client base consists primarily of ad agencies. Ad agencies business model has weakened in recent years as some major brands have brought advertising in-house instead of using an agency. While we think some companies may

change their advertising methods there will be a place for agencies. If agency use does become more obsolete, it may disrupt TTD's fundamentals near term, but longer term we believe companies will likely still utilize TTD's programmatic demand side platform.

End-state competition could be greater than expected, providing lower expected take rates: It's difficult to really know what the end-state programmatic industry will look like however, even if there are only a few key competitors left, competitive advantages could be less durable than expected which may lower the profitability and therefore long-term return potential.

Conclusion

We think The Trade Desk is a very attractive long-term investment opportunity. It provides a valuable service to its customers, has a large addressable market, and a very scalable, capital-light business model. There are signs of increasing barriers to entry in the space and as the industry consolidates there will be at least one large independent DSP such as The Trade Desk. The long-term growth outlook and cash flow potential make TTD's current valuation look very attractive.