Needham

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Content Aggregators

FAANGs with Fangs

Topic of Discussion:

How the competitive landscape surrounding the FAANGs is changing, and the implications for their relative valuations.

REPORT HIGHLIGHTS: Academic research indicates that only 5% of S&P500 companies have Network Effects. (Reminder: A Network Effect exists when a new user adds value to some or all other users - eg, telephones.) We believe that: a) each FAANG built its current valuation on the back of a powerful Network Effect; b) historically, FAANGs grew value competing against companies with weak or no Network Effects; c) going forward, the FAANGs must increasingly compete with each other to drive growth, which will test the defensive qualities of their specific type of Network Effect; and, d) because Network Effects create winner-take-most outcomes, not all FAANGs will survive.

1. **Introduction.** Of S&P500 companies, only about 15% are technology-based. Research by Medium concluded that although 35% of technology-based companies have Network Effects, 70% of the value in tech was driven by Network Effects between 1994 and 2017. By implication, the most powerful source of competitive advantages & barriers to entry (ie, moats) are created by Network Effects.
2. **Buyer Beware.** Over the past 5 years, companies with the strongest Network Effects created the most value for shareholders (our view). Press reports often refer to these companies as the "FAANGs," which stands for Facebook, Apple, Amazon, Netflix and Google. In the past, FAANGs were able to grow their market shares and economics rapidly because they were competing against the 95% of companies that have weak or no Network Effects.
3. **FAANGs with Fangs**. We believe FAANGs must increasingly compete with each other to drive growth. There are many examples of FAANGs entering each other's businesses already. There are 13 types of Network Effects and, as these companies increasing take on each other, the power of each company's Network Effects as a barrier to entry is worth understanding on a more granular level.
4. **A Battle to the Death.** We caution that the presence of Network Effects tends to generate binary valuation outcomes. In fact, digital platforms to date have proven themselves to be winner-take-most markets. By implication, not all FAANGs will survive. It makes sense to us that this is a battle to the death because: a) unique user growth adds more value than being first; b) mission-driven cultures are vulnerable to Negative Network Effects; and c) FAANGs have high fixed-cost structures.
    a. There are many examples in the internet space of a later entrant replacing the company that came first. Examples include Facebook vs MySpace and Google Search vs Yahoo Search. Being first was not as strong a moat as a new entrant building their business on a better Network Effect. Additionally, there was essentially no value for being second.

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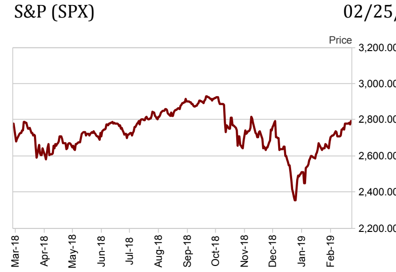
Companies Mentioned in Report:

- **A: $78.42, PT: $88.00**
- **FB: $161.89, PT: $170.00**
- **NFLX: $363.02, PT: NA**
- **AAPL, FB, NFLX**
- **AAPL: $172.97, PT: $180.00**
- **GOOGL: $1,116.56, PT: NA**
- **SNAP: $9.71, PT: $NA**

Sector Chart

S&P (SPX) 02/25/19



a. Network Effects can be positive or negative. For example, one type of Network Effect is based on Beliefs, whereby each additional person that believes something makes it more likely that the next person will believe the same thing. Religions are a good example. We believe that each of the FAANGs has a mission-driven (ie, cult) culture. A meaningful risk related to a Belief Network Effect is that the key visionary leaves, which disrupts the culture and drives desertion. (By implication, FB, NFLX and AMZN have greater risk of this type than AAPL and GOOGL whose founders/visionaries no longer run the companies.) Alternatively, the visionary remains but the Belief system ebbs, as in the case of SNAP today. In both cases, Belief can become a powerful Negative Network Effect as employees desert the company at an accelerating pace.
b. Since each FAANG has high fixed costs, small changes in revenue growth create larger operating profit and free cash flow volatility. Once a company falls behind in a Network Effects world, it is very difficult to catch up. The FAANG that falls behind gets left behind.

More About Network Effects

What are Network Effects? At the simplest level, a Network Effect occurs when each new user of a good or service adds value to some or all other users. Academics often label Direct Network Effects "Network Externalities" or "Same-Side Network Effects". Said another way, a Network Externality exists when the value of a product depends *not only on its attributes* but also on the number of consumers who purchase the same product.

Academic research has added several important findings since 1994 when Network Effects were presumed to protect Microsoft's formidable moat forever. The most relevant learnings relate to: a) persistence; and, b) effectiveness. We summarize a few of these learnings below-

- Network Effects do not persist indefinitely. To remain an effective moat, Network Effects must be buttressed and supplemented over time.
- Not all Network Effects are equally strong. Each FAANG has some form of Network Effect, but some types are more powerful as moats/barriers to entry than others.
- Internet markets tend to have winner-take-most outcomes, in part because the best programmers desert the sinking ship, creating a negative feedback loop. By implication, not all FAANGs will survive.

Investment Conclusions. Of S&P 500 companies, only 5% have Network Effects at their core. Each FAANG (Facebook, Apple, Amazon, Netflix and Google) has a powerful Network Effect. (Reminder: A Network Effect exists when the value of a product depends *not only* on its attributes but also on the number of consumers who purchase the same product.) To date, we believe that FAANGs have grown their market caps in large part because they have been competing against the 95% of companies that have weak or no Network Effects. Going forward, FAANGs must increasingly compete with each other to drive growth. Not all Network Effects are equally strong. That is, each FAANG has some form of Network Effect, but some types are more powerful as moats/barriers to entry than others. We caution that the presence of Network Effects tends to generate binary outcomes. This leads us to the conclusion that not all FAANGs will survive. We believe the moat created by each unique Network Effects will be a key input into which FAANGs generate superior investment returns over the next 3-5 years.

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