



NETWORK ECONOMIES

Sociologists began serious study of social networks in the 1930s – well before the development in the 1980s of Metcalfe’s Law positing that the number of connections in a network increases proportionally to the square of the number of actual users. Metcalfe’s Law has been interpreted to mean that the value of a network increases exponentially as the number of users increases. One can object that value also depends on other factors, the numbers of users and frequency of their use are critically important in high-tech settings.

Consider Bloomberg and Thomson Reuters’ Eikon terminals. Investors, in addition to getting real-time financial information and analysis, can message other users and execute trades with others. In recent years Bloomberg has averaged about 325,000 subscribers compared to Reuters’ 190,000 subscribers.¹ The difference in numbers of subscribers as well as their profiles are important to users, which explains why Bloomberg subscriptions are at a large premium compared to Reuters. A Bloomberg terminal costs \$24,000 per year whereas Thomson Reuters offers the Eikon at for between \$3,600 and \$22,000, according to *Wall Street Prep*. Even if a long-time Bloomberg subscriber could learn how to use Reuters in a nanosecond, he or she might not switch to Reuters because Bloomberg’s platform has a larger network of subscribers.²

Network effects can be classified as: (i) direct whereby the more users a platform has, the more valuable it becomes to other users, and (ii) indirect whereby the more users a platform has, the higher the incentives for third parties to develop compatible technologies, which in turn may foster the development of an ecosystem.

Both kinds of network effects can be observed in high-tech settings.³ Communication networks such as WeChat (with over 1 billion users) have high direct network effects and high indirect effects with the development of complementary services. Given the importance of network effects digital markets, Digital Platforms have strong incentives to quickly realize network economies by building their user bases.⁴

Is a network the same as an ecosystem? No. Apple has developed an ecosystem around iPhones and its operating system (iOS) that includes app developers, hardware companies, a large number of suppliers of inputs. Within the ecosystem, users with an iPhone can call, message, send photos, etc. to about 5 billion others who have phones. Samsung taps into a yet larger user

¹ Bloomberg vs. Reuters: What is the difference? *Investopedia*, February 27, 2023. M. Kolakowski, <https://www.investopedia.com/articles/investing/052815/financial-news-comparison-bloomberg-vs-reuters.asp>.

² This is an example of a direct effect of the network. If the network encouraged the development of apps for trading among users, that would be an example of an indirect effect of the network. (Rf., “Network Effects”, Arun Sundararaj, NYU.)

³ See the matrix in the appendix to this brief.

⁴ <https://www.govinfo.gov/content/pkg/CPRT-117HPRT47832/pdf/CPRT-117HPRT47832.pdf>.



base who communicate on Android devices.⁵

Network economies underpin the value of multi-sided platforms. Increased number of sellers on an eCommerce site will encourage more buyers. The same applies to payment systems. Standardization and openness may positively influence the size and total value of a network. Important questions for valuation include the stickiness of users and their intensity of use. Recall that Metcalfe's law concerns the value of a network increases with the number of actual users. That's why data on frequency of use and user time spent on a platform are valuable indicators. Such metrics can also help with valuations of firms that are experiencing losses: Is the firm realizing network economies in the near term that will allow it to earn profits later? Network economies are often part of the analysis of the so-called "hockey stick" pattern of near-term losses followed by profits in subsequent time periods.

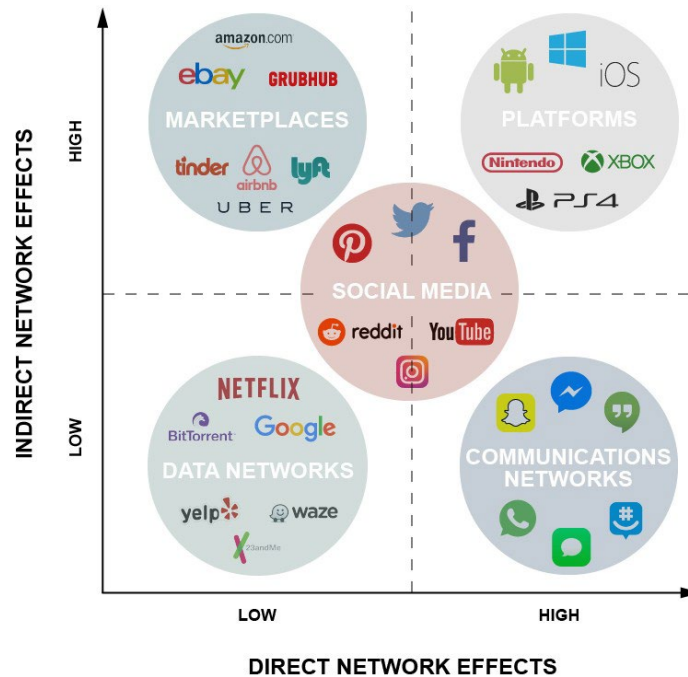
REFERENCES:

1. Katz, Michael L., and Carl Shapiro. "Network Externalities, Competition, and Compatibility." *The American Economic Review*, vol. 75, no. 3, 1985, pp. 424-440.
2. Joseph Farrell and Garth Saloner, "Standardization, Compatibility, and Innovation", *The RAND Journal of Economics*, Vol. 16, No. 1 (Spring, 1985), pp. 70-83.

⁵ "iPhone vs Android market share", Macworld, February 8, 2019.



DIGITAL NETWORK EFFECTS MARKET MAP



Source: European Commission, NFX, a16z.

Source: <https://www.niskanencenter.org/you-cant-understand-big-tech-without-understanding-network-effects-heres-a-road-map/>

