VERTICAL INTEGRATION BY MULTI-SIDED PLATFORM COMPANIES[1]

The extent to which high-tech platform companies – Alibaba, Alphabet (Google), Amazon, Apple, Netflix, Tencent, and others – have vertically integrated is dizzying. The "line-and-box" chart for Amazon in 1995 when it was an on-line book seller was simple: Books were the inputs, Amazon provided the platform, and customers connected online to search buy books. Since then, however, Amazon (a) vertically integrating backward, e.g., into book publishing and supply of merchandise generally, (b) vertically integrating forward, e.g., into product delivery and retail grocery, and (c) added major lines of business, e.g., cloud services. Drawing the line-and-box chart for the today's day Amazon would be a major challenge for even the most knowledgeable.

Amazon is not an outlier in terms of building out its business. Apple, the iconic supplier of smart phones and personal computers, introduced its App Store in 2008 and now offers its own apps, including Apple Music, iTunes Store, Apple Maps, iMovie, and Apple Arcade (games). Tencent, which began by offering messaging services, now has China's largest social network, has China's largest payment network, and is a global leader in gaming.

1. INTRODUCTION

Vertical integration by platform companies raises important issues for business and society:

1. Do consumers benefit from platform companies building out the scope of their services?
2. Have the major platform companies grown to the point where they are not subject to competitive constraints from other firms and potential entrants?
3. Should competition authorities allow platform companies to move so dramatically away from the role of a neutral platform that connects multi-sided markets?
4. What is the role of regulation?
5. What business strategies by platform companies have been successful and which have failed?
6. Does the build-out of the platform companies give them market power and resolve the "platform pricing paradox"?
7. Do users become locked into particular platforms that offer multiple services – sometimes called *monohoming*?
8. If users become more sticky and less likely to switch, what are the implications for the valuations of major tech companies?
9. While valuation metrics are available in some settings, e.g., market cap per Netflix subscriber, what valuation metrics are relevant when non-homogeneous users access different services on a given platform?
10. Which platforms are overvalued, and which are undervalued?

[1] Materials for this Brief have been prepared for Economic Analysis of High-Tech Industries (Management 960, Yale School of Management) by Aneta Gasiewska, Jakub Madej, Marley Hughes, and Janos Zsiros.

This brief addresses some of these issues. In the section 2, we review the well-accepted rationales for vertical integration. Then in Section 3 we explore motivations that are more specific to platform companies. Section 4 provides documentation on the steps that Amazon, Apple, and Netflix have taken to vertically integrate. Appendix 1 that includes information on Amazon's history of acquisitions since 1998 and Appendix 2 that provides similar information for Facebook.

Before proceeding, two points are worthy of mention.

1. This *Brief* draws on many concepts that are reflected in the *One-Pagers* on IO Concepts, e.g., Network Economies, and the *Industry Briefs*.
2. A relevant learning objective might be to develop *provisional views* on these cutting- edge issues rather than to necessarily reach *firm conclusions*. A good approach is to analyze rigorously, question systematically, and regularly update one's views.

2. RATIONALES FOR VERTICAL INTEGRATION

Vertical integration can be thought of as one end of a range of potential approaches to organizing economic activity.[2] An eCommerce firm is vertically integrated when, for example, it chooses to may produce some of the products it sells online.

At the other end of the potential range of approaches are spot transactions where the firm buys inputs or distributes its goods services to others without a formal or informal contract. As you probably are aware, spot transactions are rare in high-tech settings given the fact that most high-tech enterprises seek to protect their make specific investments in, for example, next generation products.

Between these two ends of the spectrum, firms choose among many approaches to organizing their commercial operations. These include formal contracts with various durations, restrictions, and degrees of exclusivity. These also include informal "relational structures" grounded in reputation and repetition. Another option is partial ownership.

Some terminology is useful.

Vertical formation describes the design and scope of firms at the time the firm is created.

Vertical expansion refers to efforts to expand the scope of the firm by investing internally or by acquisition.

Vertical mergers refers specifically to acquisition by one firm of an existing firm that operates in another stage of production.

Backward integration refers to engaging in activities further away from the final consumer, e.g., an acquisition by a smart phone manufacturer to acquire a chip manufacturer.

Forward integration refers to (e.g., producing an input, distributing the final product),

[2] A vertically integrated firm participates in more than one (successive) stage of production or distribution. Some firms choose to vertically integrate and perform all production and distribution activities themselves (full integration). Other firms choose to vertically integrate and perform only some of the production and distribution activities themselves while they also rely on other firms (partial integration). Firms higher in the supply chain that supply the inputs in the production process are commonly referred to as upstream firms; firms that produce the final goods are commonly referred as downstream firms.

resulting ownership and control.

Cross-ownership refers to partial ownership by one company of another with which it does business and seeks to be more aligned.[3]

These terms are useful when describing and analyzing examples. Apple's ownership of retail stores and Amazon's owner of fleets of vehicles for product distribution are examples of *forward integration*. The development of payment systems by Tencent and Alibaba are examples of *vertical expansion*. Alibaba decided to create a separate subsidiary, Ant, for payments and financial services. Many digital platforms with large user bases now supply various types of entertainment, including video and games. These are examples of backward integration.[4]

The frequency with which firms move away from spot transactions toward either contracting and vertical integration indicates that firms prefer these alternatives. Their preference may reflect they make the firm more efficient. The many *efficiency-enhancing* rationales for vertical integration include:

i. Reducing transactions costs of dealing with multiple contracts;
ii. Reducing transactions costs that arise from incomplete contracts;
iii. Realizing economies of scope across related activities;
iv. Encouraging specific investments, e.g., customized products requiring R&D;[5]
v. Avoiding double markup problems when the supplier has a degree of market power;[6]
vi. Assuring supply;[7] and
vii. Internalizing externalities, e.g., spillovers from product development, brand development.[8]
viii. Facilitating transfer of knowledge.

Given the ubiquity of contracts and vertical integration, one can make the case that these organizational forms improve overall economic performance and increase both producer and consumer surplus.

In some settings, however, firms with substantial market power may vertically integrate to gain competitive advantages over rivals that are unrelated to improvements in efficiency. These

[3] For example, Alibaba owns a stake in Ant, China's largest digital payment platform.
[4] One can consider examples in more general settings: (i) many investors use financial planning services from the same institution; (ii) purchasers of new homes do not transact individually with sub-contractors; (iii) buyers of new vehicles do not want a separate transaction for service and maintenance; and (iv) when choosing a school, many students want a campus that offers classes, housing, meals, and co-curricular activities.
[5] The "opportunism problem" arises when one party makes relationship specific investments and contracts are not complete.
[6] The double markup (also called double marginalization) arises when the downstream firm makes its pricing decisions based on the upstream firm's price instead of the actual cost of production incurred by the upstream firm, which is lower than its price. Without vertical integration or a contractual remedy, both firms add a markup. The combination of two markups leads to an inefficient market outcome.
[7] In absence of vertical integration, delivery problems may arise between the downstream and upstream firms. The communication frictions and delivery problems can be reduced by vertical integration given that it is generally easier to exchange information and coordinate activities within a firm than between firms.
[8] For example, without owning and controlling all of its restaurants, a restaurant chain can experience negative externalities because an individual restaurant has incentives to slightly decrease its quality to save costs. In contrast, if the chain owns or controls all of its restaurants, it can ensure uniform quality in all restaurants, which can result in positive externality.

advantages derive from being able to *foreclose* rivals or raise their costs of organizing activity to

meet consumer demand. Consider, for example, the implications of a firm controlling an "essential facility" or "bottleneck resource" that can be supplied by only one upstream firm (Joskow, 2006). Vertical integration by a firm with market power can also enhance its ability to price discriminate by tying inputs that meter demand or by bundling products and services to appeal to market segments.

3. NEW ISSUES RAISED IN HIGH-TECH SETTINGS

The general motivations discussed above for vertical integration apply to high-tech companies. That said, vertical integration by platform companies raise new issues because of the importance of *network effects*. We know that platforms emerge in the content of potential two-sided markets when buyers and sellers of a product or service use the platform to trade goods. The more buyers, the more sellers will want to offer their goods on the platform, and vice versa. Hence, platforms exist because of network effects.

If vertical integration expands the sets of users of a platform and the scope of their uses of the platform, then the vertical integration will strengthen the network effects and allow the platform to collect more information its users. Consider Tencent's move from messaging into gaming. Users of its messaging service could then find people with whom to play games. To the extent that the user groups for the two functions overlap, then the value of the network increases. Another effect of adding more services and products is that users spend more time on the platform.

The Tencent example makes clear that vertical integration by platforms could have both potential efficiency-enhancing effects as well as potential anti-competitive effects. When a platform expands the scope of its services, users may benefit from reduced transactions costs. The other side of the "two-edged" sword is that it may be harder for a rival to compete effectively with a platform that captures both a huge user base and a large share of the time spent in related activities. The latter phenomenon is sometimes referred to as *monohoming,* where users spend most of their time on a single platform for multiple purposes.

Hence, we have two major effects to consider:

i. When a platform increases the scope of its products and services, the value of the platform to consumers increases; and
ii. The network effects can raise barriers to entry for new platforms because they need to attract a lot of users to compete with established platforms.

Regarding the second effect, some characterize vertical integration by platform companies as resulting in markets that are "tipped". The idea is that after some point, most consumers will use the same platform. Rivals, so the argument goes, will be unable to attract users who are "locked in."

Should we accept that argument and agree with the implications that follow regarding reduced competition and increased valuations for successful platforms? Keep that question in mind as we consider the many examples of vertical integration by major tech companies in the next subsection. Keep in mind as well evidence about both (i) successes of new platforms, e.g., Tik Tok, and (ii) failures of platforms that at one time had what looked like a dominant position, e.g., AOL. As we

review the record on vertical integration, we should also keep in mind the potential for collecting and monetizing personal information.

4. DETAILED ANALYSES OF VERTICAL INTEGRATION BY MULTI-SIDED PLATFORM COMPANIES

All of the tech giants in China and the US abandoned the strategy of focusing on providing a neutral platform for a narrow set of products and services. In this subsection, we will go through some of the record.

As mentioned above, Amazon was launched in 1994 as an online bookstore. In 2000, the company started allowing the sale of third-party products on its site. By letting sellers in, Amazon started a transformation into a platform for multiple purposes. Since Amazon has collected detailed information about what its customers buy, browsed for, or are considering buying. The company has also developed tools to recommend purchases, and direct searches toward products customers are most likely to want. These data have provided Amazon with insights into popular products on its site.

Around 2009, Amazon introduced its own private label, AmazonBasics, that focused on products such as batteries, power cords, and cables, priced lower than those produced by big national brands. Within a few years, AmazonBasics became a market leader in various product lines. Building on these early successes, Amazon started expanding into additional private lables and now has over 50 private labels, with a portfolio of over 240,000 products (Mattioli, 2020). These span across categories such as adult clothing (Amazon Essentials), kids clothes (Spotted Zebra), men's underwear (Good Brief), groceries (365 Everyday Value), dog food (Wag), and home furnishing (Rivet).[9]

Amazon also leverages cross-ownership as a way of reinforcing its business relationships. Through its 2018 acquisition of PillPack, a startup delivering presorted prescription medicines to patients, it gained access to prescription medicine market in 49 states.[10] Now it is using its Prime service to reach a large patient base, even in most remote areas. Amazon also has a 16% stake in Deliveroo, a London-based food delivery company, which is planning to launch its initial public offering on the London Stock Exchange in 2021.[11] Among Deliveroo's main competitors are DoorDash and Grubhub, both of which are listed on NYSE.

Amazon has, of course, vertically integrated into distribution of products, the provision of business services, video-streaming, and gaming. Amazon even plans to establish its own network of internet-beaming satellites. Project Kuiper, a venture with over $10 billion budget, aims to launch more than 3,200 low-Earth-orbit satellites by 2030. (Pasztor & FitzGerald, 2020).

Let's turn to Apple. Originally, a device manufacturer, Apple has developed an ecosystem around the integration of hardware (e.g., iPhone and iPad) and software (e.g., iOS) to provide a shared infrastructure for the interaction of different user groups. Apple's platform enables interactions among four key industry participants: (i) third-party app developers, (ii) end users who purchase

[9] Amazon states that its private label brands make up 1 percent its $158 billion in annual retail sales, excluding products such as its Echo speakers, Kindle e-readers, and Ring doorbell cameras (Mattioli, 2020). According to its former executives, the company expects this percentage to increase ten-fold by 2022.
[10] https://www.wsj.com/articles/amazon-com-adds-prescription-medicine-options-to-its-site-11605613679.
[11] https://www.wsj.com/articles/amazon-backed-deliveroo-aims-for-12-billion-in-london-ipo-11616428625.

those apps; (iii) advertisers, and, (iv) telecom companies who provide wireless services.

A turning point for Apple was the introduction of the App Store in 2008. Initially, the App Store offered only 500 third-party apps, including the popular At Bat, Super Monkey Ball, AIM, Facebook, and Shazam apps. According to Apple, the App Store had 10 million downloads in its first weekend, 100 million downloads within a few months, and 1 billion downloads within its first year of launch (Bonnington, 2013). By 2018, the App Store offered 2 million apps for download and generated over $50 billion in sales. Apple generates revenue by taking a 15 to 30 percent share of payments. These payments are made using Apple's own payment system, ApplePay.

In 2016, Apple introduced its own apps to the App Store. With this move, Apple entered its own platform as an app developer, competing directly with third-party apps. Apple's apps cover various areas such as music streaming (Apple Music, iTunes Store), mapping/navigation (Apple Maps), or video editing (iMovie). At that point, Apple's in-house produced apps started appearing in top positions in App Store's search results (Nicas & Collins, 2019).

In 2019, Apple launched Arcade through its App Store. Arcade is a videogame subscription service that can be shared by family members across multiple Apple devices. Initially, Arcade provided access to about 100 titles for a $4.99 monthly price and was introduced to more than 150 countries (Needleman, 2019). Launching a subscription service was a major shift for Apple as in the past its users only had the option to buy games or download free games. With Arcade, Apple is going after the mobile game-software industry, which makes up more than 40 percent of the overall $150 billion game-software industry. Analysts have mixed opinions about the Arcade's potential. Some expressed doubts about Arcade's success given that "there are a tremendous number of free games on the [App Store], many of which are quite good." Others argue that Apple is a company that potentially can change mobile gamers' spending habits and that in the past new Apple services exceeded expectations.

Our last example is Netflix, which was founded in 1997 and originally operated as a DVD-by-mail rental business. Subscribers could browse Netflix's extensive DVD catalogue and have their DVD selection mailed over. When done, the subscriber could use the enclosed return envelope to ship rented movies back to Netflix.

In 2007, with its DVD-by-mail rental business faltering due to competition from Amazon, Apple, and Walmart, Netflix launched its "Watch Now" online video streaming service with roughly 1,000 titles — about 1 percent of Netflix's 70,000-video physical library (Rodriguez, 2017). As a perk on its DVD plans, subscribers could access on demand low-quality videos that could be delivered more quickly and more reliably than on other video platforms.

Since then, Netflix has vertically integrated backward into content. Some content is contracted to Netflix. Netflix Originals shows are developed, produced, marketed, and distributed by third party production companies. Other content is produced directly by Netflix. By 2018, Netflix had become the global leader in original content creation, with 1,257 hours of original content, representing annual spending of $12-13 billion on new content (Delventhal, 2018). Goldman Sachs estimates that by 2022, Netflix will spend approximately $22.5B annually on developing content.

As of January 2020, Netflix had a user base of 167M worldwide across 190 countries, and that subscriber base is growing rapidly.

5. CLOSING COMMENTS

Vertical integration by platforms can have procompetitive or anticompetitive effects on the market. Some pro-competitive effects have been observed. The elimination of the traditional retailer markup allowed Amazon to offer its AmazonBasics batteries at a significant discount. By realizing network efficiencies, Netflix has been able to offer consumers access to vast libraries of content at prices that are the equivalent of the cost of renting a few movies twenty years ago. Successful platform companies have been able to serve their users efficiently and expand in historically underserved parts of the world.[12] Vertical integration has improved supply chains.

We should not ignore the fact that the most successful tech firms are a small subset of firms that might have succeeded. Each of the leading platform companies made strategic decisions, including what companies to acquire and what capabilities to develop.[13] Amazon decided to expand on multiple fronts. Apple, for example, chose a closed software system. Neflix decided to invest heavily in its own video content. In a similar vein, other firms failed to foresee what was most important, invest accordingly, and execute. There was a time when, for example, Apple competed with Palm and with Blackberry. Likewise, there was a time when Netflix and Blockbuster had similar strategic options.[14]

A major question concerns switching costs for users. By itself, stickiness may indicate that the platform is meeting consumer needs. If so, the relevant questions are (i) whether the platform can exercise market power, and (ii) whether rivals that offer better services and products will be able to gain enough traction to maintain a competitive constraint on the performance of more established platforms.

A final issue concerns information. Successful tech companies are positioned to collect massive amounts of personal information. The same companies can use such information to influence customer's decision making. When they are vertically integrated, they can also use such information to favor their own products and services.

What is the future of major platform companies? Much will depend on whether competition policies will be used to constrain their development or even require divestiture of acquired assets.[18] Regulators could also intervene to set new rules of conduct regarding disclosure and interoperability.

[12] Netflix subscribers can access its content in 190 countries worldwide.
[13] AltaVista had three times the share of Google in 2003 (Sullivan, 2013).
[14] One might ask, would constraints on acquisitions promote competition? Consider the Facebook-Snapchat acquisition discussions. No agreement was reached. Instead Facebook deployed its own filters and 24-hour stories on Instagram (Shinal, 2017).

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