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Walmart Inc. Takes on Amazon.com

As Walmart entered 2018, it faced critical decisions about its future. Ecommerce was exploding, and the industry leader, Amazon.com, had captured Walmart's long-held crown as the most valuable retailer in the world. Amazon grew revenue ten times in the past decade, compared to a 20% growth in overall sales for Walmart. With the recent acquisition of Whole Foods for \$13 billion, Amazon was moving aggressively into the offline world and challenging Walmart in its biggest business (grocery).

Yet, Walmart was not standing still. It had bought Jet.com for \$3 billion in 2016 and while its U.S. ecommerce revenues had grown to \$11.5 billion in 2017, there was no debate in Bentonville: Walmart remained far behind. The question for Walmart CEO, Doug McMillan, and Marc Lore, the founder of Jet.com and head of Walmart.com, was how the company should respond to its most aggressive competitor (**Exhibits 1a and 1b**).¹

Amazon

The Early Years 1994–2001

Jeff Bezos founded Amazon in 1994 to exploit the Internet, a technology introduced four years earlier. He determined that selling books online had the most promise because the number of titles available was greater than even the largest brick-and-mortar store could stock. Betting on this advantage, Bezos and his wife drove west to start "Earth's Biggest Bookstore" in Seattle, Washington.

Amazon offered 1 million titles for sale on its opening day in July 1995. Next year, the company had over 2.5 million book titles for sale, with revenue doubling every quarter (**Exhibits 2, 3a and b**). Amazon itself initially held little inventory in its warehouse, relying on a local book wholesaler to source its vast selection. Beyond variety, Amazon also offered lower prices—Washington state had no sales tax so when shipping to states with sales tax, prices were on average 6% lower—but Bezos' philosophy was that "there are two kinds of companies, those that work to try to charge more and those that work to charge less. We will be the second."² To fund growth, Amazon went public in May 1997 at a valuation of \$438 million. Money was invested in building out its own national network of fulfillment centers, and acquiring IMDB whose movie data and reviews could jump start video sales.

Professors David Collis, Andy Wu, and Rembrand Koning and Research Associate Huaiyi Cici Sun prepared this case. This case was developed from published sources. Funding for the development of this case was provided by Harvard Business School and not by the company. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

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By 1997, believing in the absolute importance of being “Earth’s most customer-centric company,”³ Amazon had introduced a secure and easy interface for first-time online buyers, online customer reviews, a collaborative filtering algorithm that leveraged purchase history data to recommend books, and filed a patent for its single-click “buy now” checkout process (**Exhibit 4**). In 1999 to broaden the product categories offered on the site, Amazon launched zShops which let third-party merchants setup their own “store fronts” for a fee. In the same year Bezos also introduced an auction platform and signed partnerships to let internet startups list on Amazon under their own name, like pharmaceuticals from Drugstore.com and pet supplies from pets.com.

The Internet Bubble Bursts: 2001–2005

Bezos’s focus was on the long term, noting in Amazon’s first annual report in 1997 that, “when forced to choose between optimizing the appearance of our GAAP accounting and maximizing the present value of future cash flows, we’ll take the cash flows.” However, with the bursting of the Internet bubble in 2000, the market began to question whether Amazon would ever see future cash flows. The company’s shares dropped from \$100 to \$20 as it lost \$1.4 billion that year. Its strategic partners filed for bankruptcy or were sold for pennies on the dollar.

Bezos diagnosed those failures in his annual letter to shareholders:

We believed passionately in the “land rush” metaphor for the Internet. Indeed, that metaphor was an extraordinarily useful decision aid for several years starting in 1994. In retrospect, we significantly underestimated how difficult it would be for single-category e-commerce companies to achieve the scale necessary to succeed. Online selling is a scale business characterized by high fixed costs and relatively low variable costs. This makes it difficult to be a medium-sized e-commerce company.⁴

As a consequence, Bezos doubled-down on building out Amazon’s scale (**Exhibit 5**). He improved its logistics capabilities by hiring top talent from Black & Decker, Delta Air Lines, and Walmart who applied data analytics to identify unprofitable or expensive-to-ship items. It then introduced free shipping for three to five day delivery for orders over \$100.

Bezos also shifted Amazon’s strategy from a multi-store to single-store vision. Amazon itself systematically expanded into additional categories, extending from books into consumer electronics, CDs, and sporting goods. Amazon Marketplace was launched allowing third-parties to sell products that would be displayed alongside Amazon’s own offerings and shipped using Amazon’s logistics network for a 15% fee plus fulfillment costs of about \$5 per item that depended on the weight of the item and the time spent in the Amazon warehouse (merchants paid shipping to the Amazon fulfillment centre). An alternative program allowed merchants to list on Amazon for the 15% fee but with delivery arranged and paid by merchants themselves. Amazon tended to give preferential listings to vendors that used Amazon’s system but was believed to identify, and then list itself, best-selling items offered by other vendors. Later it began to sell its own private label products, Happy Belly (pasta), Wickedly Prime (snacks), and Mama Bear (baby food).

Building Platforms: 2006–2016

Amazon always thought of itself as a technology company. As Bezos noted, “we’ve had three big ideas at Amazon that we’ve stuck with . . . and they’re the reason we are successful: Put the customer first. Invent. And be patient.”⁵ This came with a belief in taking risks since, “a small number of winners pay for dozens, hundreds of failures.”⁶

Amazon Prime was introduced in 2005: an annual subscription service that provided free two-day delivery on millions of Amazon items. Six years later Amazon was still losing \$10 per Prime customer,⁷ but by 2016 each customer was spending an average of \$1,200 per year, double the non-Prime customer spending rate.⁸ By 2017, Prime also included music and video streaming, photo storage, and two-hour delivery for some items with Prime Now; a package estimated to be worth more than \$700.⁹ However, Prime's \$99 annual subscription price encouraged purchases of single items that were expensive to ship. In 2017 Amazon shipped over 1.2 billion separate packages in the US,¹⁰ and one estimate was that fulfillment costs could approach 18% of a single item's retail price.¹¹

Amazon offered its first version of e-books in 2000, but its entry into digital media did not get traction until the launch of the Kindle e-reader in 2007. By 2017 sales of digital books were larger than physical books and Amazon had an 83% share of all online book sales.¹² Similarly, Amazon's video streaming service took off when it was included in the Prime offering. By 2017 the service was offered globally and Amazon was not only competing with Netflix with a \$6 billion content acquisition budget, but also in production through Amazon Studios, launched in 2010.

Amazon entered the consumer hardware market, with mixed results. The Kindle e-reader launched in 2007 for \$399, sold out in under six hours. While Amazon made no profit on the devices, Kindle owners spent four times non-owners on both digital and paper books.¹³ In contrast, the Fire smartphone sold only 35,000 units its first 20 days and demand never took off even when offered for \$1 with a service contract.¹⁴ The failure did not reduce the appetite for experimentation and in 2014 Amazon introduced the smart voice assistants Echo and, the seemingly ubiquitous "Alexa," along with Dash buttons for single-click ordering that had over 200 brand partners by 2017.

The relentless focus on customers and technology did not just apply to internal innovation. In 2009 Amazon acquired Zappos, an online shoe retailer that offered free shipping, free returns, and personalized customer service leading to a "customer obsession" which Bezos wanted Amazon to learn.¹⁵ On the technology front Amazon acquired Twitch, a video-game streaming service, and Body Labs whose artificial intelligence (AI) modelling created 3D body shapes for the apparel industry.¹⁶

Amazon introduced Amazon Web Services (AWS) in 2006. The idea originated during an executive retreat at Bezos's house that identified one of Amazon's core competences as running the web infrastructure—databases, server provisioning, physical data centers—to support its e-commerce operation.¹⁷ After three years developing a plan, Amazon offered Simple Storage Services, allowing firms to store data on its server farms for a per gigabyte price. By 2017, having invested at a rate estimated to be approaching \$10 billion per year,¹⁸ AWS had nearly 35% of the global market for cloud infrastructure, more than the combined share of its five closest competitors,¹⁹ and was used by companies like Netflix and Unilever. AWS was Amazon's largest source of operating income.

Amazon continually upgraded its distribution infrastructure and logistics operations. It acquired Kiva Systems, a manufacturer of warehouse picking and packing robots, and by 2017 had installed 45,000 Kiva robots across its facilities. Robots reduced the "click to ship" cycle from 65 to 15 minutes and supported 50% more inventory per square foot.²⁰

Amazon's classic distribution network was originally optimized to minimize state sales taxes, not shipping costs,²¹ having a few large fulfillment centers which used FedEx and UPS to ship across the country, often by plane, and for local delivery by van direct to homes. Nor did its traditional logistics system have any local delivery points. However, by the end of 2013 Amazon decided to start collecting sales tax. At the same time, the company shifted from a focus on massive fulfillment centers in remote locations with low cost and low sales tax towards a fulfillment network positioned close to large

metropolitan areas.^a By 2017 Amazon had a fulfillment node within 20 miles of 50% of the U.S. population up from 5% in 2015. It was establishing smaller sort centers where products would be sorted by zip code for pallet delivery to a local U.S. post office as a cheaper way to get two or more day delivery into the home. The company was also investing \$1.5 billion in an air cargo hub in Kentucky for its fleet of forty leased Prime Air planes that were substituting for FedEx and UPS on long-haul shipments.²² In 2017 more than 90% of goods still went through fulfillment centers.²³

Amazon was complementing its online fulfillment logistics system with physical stores and local delivery capability. By 2017, Amazon had opened 13 retail book stores. More futuristically, it opened an 1,800-square-foot Amazon Go retail store in 2016 in Seattle that used computer vision to track what shoppers put in their baskets; eliminating the need for cashiers and checkout.²⁴ But the main Amazon moves towards local distribution enabling same-day delivery concerned the grocery business.

Amazon Enters Retail Grocery: 2017

In 2017, U.S. consumers spent \$675 billion on groceries with only 2% of those sales taking place on the Internet²⁵—the equivalent of sales from 764 grocery stores. Indeed, online grocers had a history of epic failures, with companies like Webvan going bankrupt in the dotcom bust after raising a billion dollars in financing. Nevertheless 12% of U.S. consumers shopped for groceries online at least once during 2016,²⁶ and an estimated 43% of millennials expected to buy groceries from the web in 2017.²⁷

Amazon had been experimenting with online grocery delivery since launching Amazon Fresh in an affluent Seattle suburb in 2007. By 2017, positioned under the tagline: “Convenience, Delivered.” Amazon Fresh was available for \$299 per year for same-day delivery of groceries and 500,000 other Amazon items in seven major urban areas. Prime Now initially launched in New York City offered a limited selection of products delivered within one hour for \$7.99 and within two hours for no additional fee. By 2017, Prime Now was available in dozens of large cities and customers could have over 25,000 items, including goods from brick and mortar stores and food from local restaurants, delivered, sometimes using Amazon Flex workers to do last-mile delivery.²⁸ Outcomes were mixed, Amazon Fresh, for example, suspended operation in November 2017 in parts of several states.²⁹

Amazon’s internal grocery experiments were eclipsed on June 2017 when it purchased Whole Foods Markets for \$13.4 billion.³⁰ Whole Foods dominated the organic groceries niche, with EBITDA margins of 9.5% compared to the conventional supermarket margin of 4.5%. Known colloquially as “Whole Paycheck,” its prices were estimated to be 19% to 37% higher than Walmart’s.³¹

Amazon’s first move upon acquiring Whole Foods was to lower prices nearly 30% on some select products, such as organic bananas, avocados, and organic rotisserie chicken.³² Longer term, it was expected that Amazon would provide deals to Prime members—60% of Whole Foods shoppers were already Amazon Prime subscribers³³—and launch Whole Food’s “365” private label online. Amazon could also gain valuable data on grocery purchase trends and habits.³⁴ And it now had access to Whole Foods’ network of 11 distribution centers, its grocery supply chain and 18 million square feet of fresh food storage space, as well as 465 stores.

As one analyst noted “I suspect Amazon’s ambitions stretch further: Amazon Grocery will be well-placed to start supplying restaurants, gaining Amazon access to another big cut of economic activity.”³⁵ Next on the potential list of categories for Amazon to enter was the \$412 billion pharmaceutical market.

^a A company with operations in a state is by law required to collect sales tax for that state.

Walmart

Retail Stores

In 1962, contrary to conventional wisdom that discount stores could only survive big cities, Sam Walton opened his first-ever Walmart discount store in rural Rogers, Arkansas.³⁶ The company's early success and continuous growth built on a core set of Sam Walton's ideas, including "buy it low, stack it, and sell it cheap" (**Exhibit 6**). Walmart practiced the policy of "everyday low price," offering a full set of products at low prices all year round, rather than lowering prices of a few products for promotional purposes. Walmart's prices were on average between 2% and 10% lower than competitors.

The remote, isolated locations of many early Walmart stores made it costly for distributors to directly supply those stores. Between 1970, the year that the first Walmart distribution center was constructed, and 2017, a total of 173 such centers were built in the U.S., extending over 125.8 million square feet. Each distribution center was a hub in Walmart's network, supplying all Walmart stores within a radius of about 150 miles with about 140,000 SKUs. By 2017, about 80% of Walmart's sales went through its own warehouses. The remainder was Direct Store Delivery (DSD) distributed directly to stores by suppliers³⁷.

After 1976, Walmart introduced merchandise assembly, cross-docking, computerized inventory tracking, and data-driven storage optimization, all improving inventory turnover which reached 11.5 times in 2011 compared to Amazon's 9.6 times.³⁸

Through the 1980s, Walmart introduced electronic data interchange (EDI) with suppliers. This provided real-time information on the sale of a product in store, available warehouse storage capacity, notification of shipment, and forecasting. EDI also provided Walmart with the latest market trends, enabling it to make rapid adjustments to pricing and supply.

Entering supercenters in 1988, Walmart combined traditional discount retailer merchandise, clothes, household goods and electronics, with grocery. By 2017, the majority of its stores were supercenters and 56% of Walmart's total sales in the US (including Walmart.com) were grocery (**Exhibit 7**).³⁹ In 1983, Walmart entered the warehouse clubs business with its Sam's chain, and by 2017 this accounted for 16% of North American retail sales; international sales was 24%.

Walmart.com

In 2000, Walmart opened its own online shopping platform, placing its e-commerce headquarters in Silicon Valley, in the hopes of benefiting from the area's technological resources and human capital. By 2004, in the face of continuous losses, Walmart.com continued to grow sales. CEO Lee Scott admired the success of Amazon and e-Bay, but did not view Wal-Mart's online business model as similar. Wal-Mart focused Internet operations on supporting Wal-Mart physical stores and Sam's Club to service its customers, by helping customers understand the quality and price of items in the stores and enabling them to buy there or online.⁴⁰ From 2007 onwards, Walmart.com introduced free in-store pickup for items ordered online at over 750 of its U.S. stores.⁴¹ Mike Smith, director of Walmart.com, noted that when customers went to stores to pick up their online order, nearly half of them would spend an additional \$60 in the store.⁴² Walmart continued to explore improvements to the efficiency of in-store pickup, such as building a drive-through window.

Wal-Mart.com did not create a marketplace for third-party vendors until 2009, when it allowed a select group of vendors, such as ebags.com, to sell on its website.⁴³ That year, Walmart.com's growth began accelerating when it implemented a low price buy online, pick up in store approach—which

represented 40% of their online sales—while also signaling a commitment to price leadership, particularly in books, personal care, and beauty products.

In 2012 Walmart recognized the need to overhaul its online business that, at about \$7 billion in revenue, was a fraction of both Amazon's and Walmart's total revenue. Part of the problem was the limited selection of goods available on Walmart.com—a Boston Consulting Group study at that time found Amazon offered 2,870 facial moisturizers online, Walmart.com only 20.⁴⁴ Partly this was due to the organizational separation of Walmart.com, and partly because the operation still relied on off-the-shelf-software. Walmart.com then-CEO Raul Vazquez noted, "There was a time when the online and offline businesses were viewed as being different. Now we are realizing that we actually have a physical advantage thanks to our thousands of stores, and we can use it to become No. 1 online."⁴⁵

In response, Walmart introduced a massive project, named Pangaea after the ancient supercontinent, led by Jeremy King, CTO of Walmart's e-commerce operation. Pangaea implemented a new cloud infrastructure to support transactions, databases, and analytic tools and was the foundation for digitalizing customer services and enhancing user experience on Walmart.com. "Given how rapidly this place is changing, we did not have time to screw around," said King.⁴⁶ In the next four years Walmart made 14 acquisitions to support its e-commerce operations, rebuilt its underlying e-commerce technology, developed a Walmart mobile application and carried out a large-scale hiring of new employees, of whom 3,000 were Silicon Valley engineers.⁴⁷ Acquisitions included Kosmix, later renamed Walmart Lab, which used natural-language algorithms to more effectively personalize search results in a way that boosted search-related online sales by 10% to 15% (**Exhibit 8**).⁴⁸

In parallel, Walmart began to build out the logistics system needed to support two-day shipping to online customers. By 2017, it had built 22 fulfillment centers to handle small orders picked and packed for individual shoppers, like its largest one in Bethlehem, Pennsylvania, which covered over 1 million square feet, employed over 350 full-time staff members, and stored more than 500,000 items. Three-quarters of Walmart.com sales were fulfilled from this system, rather than using the store distribution network,⁴⁹ although that network had 90% of the U.S. population within 10 miles of a Walmart.

Beginning in 2016, Walmart launched a free three-day shipping service, but in 2017, in response to Amazon Prime, Walmart launched free two-day shipping. This did not have a membership fee, but required a \$35 minimum purchase for free delivery, though in-store pick up continued to be free with no minimum purchase requirement.⁵⁰ From 2015, Walmart offered same-day pickup of grocery products in over 1,000 stores, and grocery made up 26% of Walmart's U.S. e-commerce sales in 2017.

Jet.com and Beyond

While Walmart online sales growth increased in early 2016, it still underperformed the industry. In August that year it announced the acquisition of Jet.com for \$3.3 billion whose founder, Marc Lore, was a well-known entrepreneur in e-commerce, having started the online retailer Quidsi in 2005. Quidsi was essentially a collection of focused retail websites, such as Diapers.com, Soap.com, or Wag.com, that featured bulky products that were frequently repurchased. Amazon, feeling the pressure from Diapers.com, had engaged in a price-war before acquiring it in 2011 for \$545 million. After the acquisition, Marc Lore worked at Amazon for two years before leaving with about thirty former Quidsi employees to create Jet.com and challenge Amazon again with lower prices.

Jet.com functioned as a marketplace for other retailers without having its own warehouses and used sophisticated pricing technology, called Smart Cart, to provide discounts to customers according to factors such as order size and distance to partner warehouses. The more items customers added to their virtual cart, the more money they saved. While Jet.com had an urban, young, millennial customer base

that was more likely to make purchases online, and increasingly via smartphone, it had shortcomings. There was a limited number of sellers on the website and no consistent price advantage; due to the fluid price-setting, it was sometimes less and sometimes more expensive than competitors.

Observers suspected that Walmart's motive for the acquisition was to gain Marc Lore's inside knowledge of Amazon. He was appointed CEO of Walmart's entire domestic e-commerce business with over 15,000 employees,⁵¹ and given the goal of accelerating growth of the online business by integrating online and physical store resources. He integrated jet.com and Walmart.com operationally — though leaving them as separate websites — and filled key executive positions with managers from both companies, leading to the exit of some of the Walmart managers.⁵² Lore also established new functional teams to improve aspects of the online business, such as the ordering process, returns, and fraud prevention.⁵³

In 2017, Walmart acquired Bonobos, an e-commerce apparel company focused on high-end men's clothing and with some innovative distribution channels. Acquiring this and others specialty retailers, like Moosejaw and Hayneedle, aligned with Walmart's e-commerce strategy of having "category experts" in its product portfolio that could manage the entire online category for the company and elevate its brand image.⁵⁴

In September 2017, Walmart partnered with Google to enable customers to purchase Walmart products via voice shopping from Google Express and Google Home.⁵⁵ Walmart also partnered with Uber, Lyft, and Dely to launch a grocery home delivery service from Walmart stores, tested in six cities in August 2017. After the customer placed an order online, an in-store employee picked out the ordered items and called Uber or Lyft to deliver them to the customer's home for a \$7 to \$10 fee.⁵⁶ To complement this service, Walmart explored the idea of using its employees to make deliveries.

Lore believed that Walmart was in a strong position in online retailing. As the stores were already profitable, any incremental online sales shipped from there was, as Lore said, "at an incredible profit."⁵⁷ The combined logistics system also allowed Walmart to serve 87% of the country overnight and 99% in two days. Beyond that Lore said, "we already have trucks moving orders from fulfillment centers to stores for pickup, those same trucks could be used to bring ship-to-home orders to a store close to their final destination, where a participating associate can sign up to deliver them to the customer's house."⁵⁸ In support, Walmart spent \$1.2 to \$1.5 billion on e-commerce and digital initiatives in 2016.⁵⁹

Consumer Behavior

In 2017 nearly two-thirds of consumers in developed countries made at least one online purchase every month, with about one-quarter making weekly purchases online.⁶⁰ In the U.S., the overall e-commerce share of total U.S. retail sales was 7% to 8 % and the average consumer spent \$1,800 online each year.⁶¹ However, the penetration of online purchases differed widely among categories driven by differing consumer preferences for how they bought goods and where they wanted them to be delivered or picked up (**Exhibit 9**). Additionally, consumers often interacted with a retailer through multiple channels even when making a single purchase.

One determinant of the *willingness to purchase online* was the need to be informed about a good before purchase as opposed to simply experiencing its use. Buying a television might require a visit to a store to see it in operation and understand, possibly from a store clerk, the implications of different specifications. However consumers could then check online prices on their mobile phone while still in the store—so-called "showrooming." As a result, Best Buy, the electronics retailer, simply sought to

match prices of its online competitors. In contrast, consumers could trial a simple item, like bleach, with an online purchase to determine its efficacy and whether to repurchase the brand. The huge variety of items (562 million on Amazon) that could be displayed online as compared to in a store (142,000 in a Walmart) also affected where consumers went to buy different goods.⁶²

Predictability and frequency of purchase seemed to make online purchases more attractive. Quidsi, for example, had success selling diapers online—a bulky item for which parents could reasonably estimate the number and frequency of their children’s needs. Placing regularly bought items on the “Alexa shopping list” or hitting the “Dash” button on the fridge or cupboard might therefore make sense for repeat purchases, like toothpaste. In contrast, an item, like chocolate, might be less frequently bought online because consumption was more impulsive.

Fresh foods were different again as consumers often wanted to see, feel, and smell a pineapple, for example, before selecting one. As a result, the average grocery shopper visited their local store 83 times a year, while Amazon Prime customers placed orders an average of 60 times a year.⁶³

Consumers differed in terms of the *value of the convenience of shopping from home* by income level—with wealthier households more likely to buy online and willing to pay a higher premium for the service—and geography—with metropolitan areas spending more online annually on average (\$853) than suburban shoppers (\$768) or those in rural areas (\$684).⁶⁴ Age also played a role, with younger people more willing to buy online—44% of their “shopping” budget was spent online by millennials, compared to 39% by Gen X, 31% by baby boomers, and 22% by seniors.⁶⁵

Consumer preferences also differed according to their *willingness to pay for rapid delivery*. As above, this varied by category, geography and income with a clear tradeoff between speed and price. One study found that about 30% of consumers would pay a significant premium, up to \$3, for same-day delivery, but the remaining 70% preferred the cheapest option for home delivery regardless of speed.⁶⁶ Another study found that nine out of ten consumers regarded free shipping as the top incentive that would make them shop online more.⁶⁷

A final dimension of consumer choice concerned *where the item was delivered or picked up*, regardless of how it was purchased. Part of that decision was driven by price; picking up in a store was in principle cheaper than having an item delivered to the doorstep. Part of the decision depended on the size of the item. Most people were willing to pay for home delivery (and setup) of furniture, for example, because it could be physically challenging to get the item home and into the house. But some consumers had real concerns about theft and freshness when packages were dropped off on doorsteps, front yards or porches. Similarly, many apartment buildings lacked a common space to safely leave packages.

As a result, companies that were providing “last mile” delivery options were concentrating deliveries at the end of the day or offering a specific delivery time window which the consumer chose. They were experimenting with a variety of lockers and bins for the porch or garage that would be more secure than simply dropping a package in plain sight, and which could potentially also be refrigerated. They were also establishing pickup locations in more convenient places, like Mail Boxes Etc.

A consumer’s choice also depended on the *price comparison* between stores. According to one study of 52,000 items, on average Amazon prices were about 3% to 4% below those of Walmart.com,⁶⁸ though that varied by category and over time as companies frequently altered prices (**Exhibit 10**). Bain & Company also had Amazon as the cheapest source for 70% of best-selling items and 25% of all items, and equal lowest on 90%, and 70%.⁶⁹ However, other sources found Walmart.com to be up to 10% cheaper than Amazon⁷⁰. If an item was much cheaper in one distribution outlet than another—as, for

instance, on Black Friday when online retailers cut prices to boost sales after Thanksgiving—even consumers who might not normally consider using that channel would do so.

Retailers were continually scanning each other's sites to monitor prices and dynamically adjust their own prices accordingly. As opposed to weekly price changes in stores, Amazon reportedly changed prices several times a day as demand ebbed and flowed for certain items.⁷¹ This activity led to a cyber war as bots crawled competitors' sites which were in turn blocked by other software. Other optimization software looked to push certain items when a customer made online purchases or to offer discounts on items that would fill a package and so not incur additional shipping charges.

Distribution Economics

A critical part of a retailer's cost structure concerned the logistics of getting products from the manufacturer into the home (**Exhibit 11**). In particular, the expense of "last mile delivery" was not to be underestimated. In the Internet bubble many startups, like Webvan, appeared to ignore the true cost of delivering items to the home and suffered accordingly. While the Internet had changed consumer access to retailers, technology had not yet done much to change the economics of distribution.

Distribution costs for the entire supply chain included storage costs at each stage that an item was warehoused; picking and unpacking costs whenever an item was moved from or into a warehouse or stocked onto shelves; transport costs each step of the way, including long-haul and last-mile delivery; and packaging costs, as when an item had to be wrapped into the ubiquitous Amazon delivery box. In addition were the working capital charges for inventory sitting in warehouses and on shelves; and the lost revenue from retail markdowns when surplus goods in the supply chain had to be discounted to sell to consumers, or the lost sales that resulted from out of stock situations.

Returns were an important but often overlooked aspect of distribution cost. Some categories of purchases, like fashion clothing, could see 40% or more items being returned. This incurred not only the additional shipping cost but also customer service and handling costs. When online retailers, like Zappos shoes, offered a free return service, the cost was perhaps 3% to 4% of the retail price. Other categories, like detergent, saw very little in the way of returns.

Most important to the cost of getting any particular purchase from the place where it was manufactured to the buyer's home was the choice among the four modes currently used by retailers (**Exhibit 12**). For each of these, the size, weight and value of an item affected cost, as did the total size of the purchase—single items were more expensive than a bundle of goods going to the same location. It was estimated in 2017 that an order had to be over \$85 to be profitable for an online retailer.⁷² In addition, the freshness of the product had an important influence on cost, determining how quickly an item had to be moved through the logistics system and whether it required refrigerated or chill storage.

Scale economies potentially gave a 3% to 5% cost advantage to a large national online retailer, such as Amazon.⁷³ With scale came more fulfillment centers which reduced shipping distances and hence cost, and accelerated delivery times; optimized inventory control by placing fast-moving items in multiple centers closer to the customer^b; as well as purchasing power leverage over shippers and other service providers. A bricks and mortar retailer with over 1,000 stores and ten distribution centers could get close to this cost position if it carefully managed the multi-channel supply chain. McKinsey

^b An increase in distribution points tended to reduce the number of items shipped in each package. For Amazon an average of just 2.3 items out of a 6 item order were sent per package in 2015 vs 3.1 items per package in 2013.

estimated that with 12 optimally located distribution centers, a retailer could cost effectively offer one day delivery to about 80% of the U.S.⁷⁴

For last-mile delivery, costs depended on the geographic density of the area being served. Rural areas with long distances between houses were most expensive to serve, but apartment buildings and traffic and parking delays also made delivery in dense urban and downtown areas expensive. Local market share was a key driver of relative cost position in the last mile as it determined how dense the drop offs would be on any route. Speed of delivery for the last mile was also a key driver of cost. For less than one hour delivery, a person in a small vehicle coming from a local warehouse or physical store was perhaps the only feasible way to meet the deadline, but at a cost of \$7 to \$10 per delivery.⁷⁵

Technology choice In designing their logistics systems, retailers had to consider the tradeoff between speed, variety and cost (**Exhibit 13**). While seeming to perform the same task, a distribution center for a retail store which cost between \$100 and 150 million⁷⁶ was very different to a fulfillment center designed for home delivery of online purchases, which cost between \$150 million and \$250 million⁷⁷ (**Exhibit 14a and b**). The former was designed to handle bulk loads of full pallets with forklifts and typically stored 100,000 SKUs. Combined with truck delivery, this was the low-cost way to handle logistics into a given locality. The latter picked from over 500,000 individual items on shelves, either by hand or, increasingly, with some form of robotic assistance. With individual handling and air freight, this was the most effective way to deliver a wide variety of products direct to the home. In both, software optimized the location of items in the warehouse and minimized the distance travelled to pick an order, while automation of the picking process had increased dramatically.

Combining both systems in an omnichannel approach (as opposed to multi-channel retailing of parallel but separate online and physical store systems) held out hope of maximizing the benefits of national scale. Efficiently deploying inventory between distribution centers, fulfillment centers, sort facilities, physical stores and pick-up locations could, in principle, reduce logistics costs, but required intense data and analytic capabilities to dynamically match products to storage and delivery points.

The last mile was perhaps the area where there was most technological uncertainty. Currently UPS, FedEx and the Postal Service delivered directly to the home via a small van. Experiments were being conducted by retailers to use Uber or other local delivery operations instead. More futuristically, both Walmart and Amazon were experimenting with drones and autonomous robots that could deliver to homes without any human involvement. A McKinsey study suggested that autonomous guided vehicles dropping items in lockers would be the low-cost alternative (40% cheaper in a high labor cost country) for home delivery in the future.⁷⁸ As a very different alternative, 3D printing and other ways to manufacture individual items locally rather than at a distant factory were being investigated.

Amazon versus Walmart in 2017

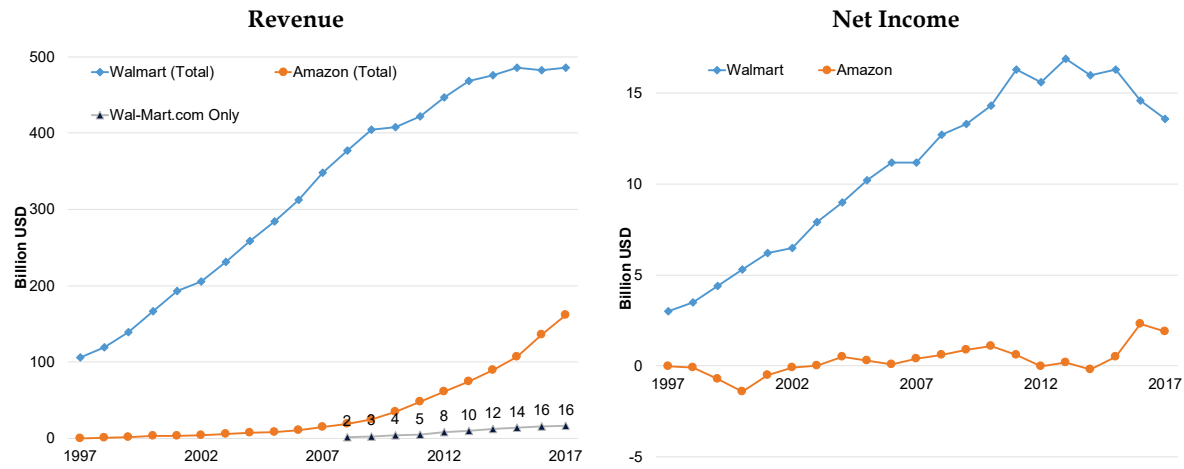
In 2017, total retail sales through Amazon were approaching an annual rate of \$200 billion, of which more than half were from third-party retailers who paid Amazon for listing their products and providing fulfillment and billing services.⁷⁹ Amazon Prime membership in the U.S. exceeded 60 million customers; double the number of members in 2015. In contrast, Walmart's e-commerce sales in 2017 reached \$16 billion, an online market share of 3.3%, behind Amazon and Apple,⁸⁰ representing 4.3% of Walmart's total revenue—up five times from what it had been in 2009. Walmart.com brought in 92 million monthly visitors⁸¹ yet only 13% of store customers shopped weekly at Walmart.com while one-third did so at Amazon.⁸² Other differences included customer demographics, logistics systems and capabilities, as well as customer satisfaction—Amazon had a 54 net promoter score (60 for Prime) compared to 40 for other online retailers and 36 for physical store retailers⁸³ (**Exhibits 15 through 19**).

As 2017 came to an end, competition between Walmart and Amazon heated up as each attempted to optimize its marketing and distribution systems. Amazon began subsidizing some third-party vendor's products by up to 10% to make them price competitive. It introduced a new in-home delivery service, Amazon Key, in which, for \$249 and a Prime membership, items were delivered into the home by an employee who had access through a security lock and was monitored by a security camera.⁸⁴ It also signed a deal to put "Hub" lockers in buildings with over 850,000 apartments.⁸⁵

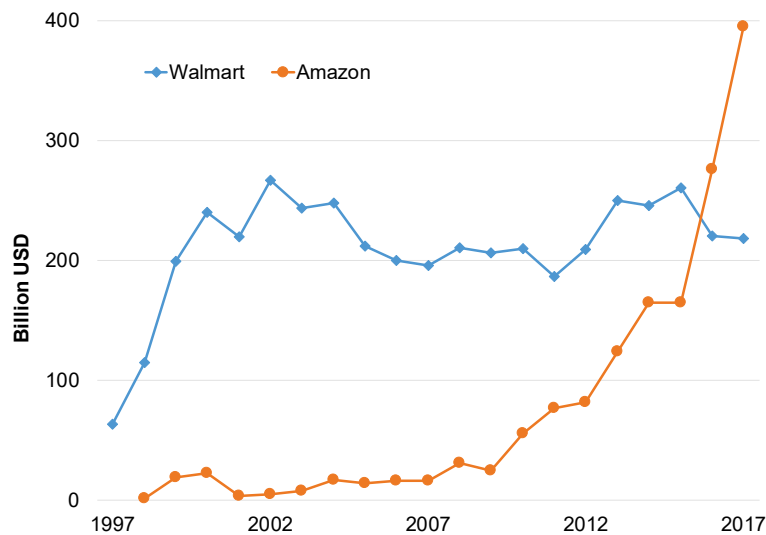
Walmart responded with its own version of delivering groceries straight to the refrigerator through a partnership with a smart home provider,⁸⁶ and began to offer small discounts on some 10,000 bulky items, such as car seats, that were ordered online but picked up in-store to pass along the shipping cost saving calculated using the Smart Cart application.⁸⁷ It also completed a deal to bring retailer Lord & Taylor onto its website in order to boost the range of clothing brands it offered.

As Black Friday and Cyber Monday, approached in November 2017, traditionally the busiest retail and online shopping days of the year, respectively, and Jeff Bezos became the world's richest person with a net worth of \$100 billion, Lore, and Walmart CEO, Doug McMillon, knew they had to implement an effective long-term strategy to address the Amazon threat. Renaming the corporation "Walmart Inc." from "Wal-Mart Stores" that month gave a clue to the importance they attributed to getting the online strategy right.

Some observers felt that Walmart was in a strong position. A Citi Research analyst noted that, "Walmart's aggressive omnichannel strategy will continue to drive significant sales growth and (that) Walmart's ecommerce operations are emerging as a true challenger to Amazon," citing Walmart's biggest strengths as its grocery offering, everyday low price positioning and "increasingly seamless integration" of its stores and website.⁸⁸ Others disagreed noting that, "more than two decades since the company's founding, Jeff Bezos still runs Amazon like a startup, sacrificing profitability in order to steadily gain market share,"⁸⁹ while Amazon's "significant competitive advantages that are hard to replicate included a) scale in both demand and fulfillment capacity; b) logistics; c) growing adoption of Prime; and d) leadership in Cloud through AWS."⁹⁰

Exhibit 1a Amazon, Walmart, and Walmart.com Revenue and Net Income, 1997–2017 (billions USD)

Source: Casewriter; compiled from Capital IQ.

Exhibit 1b Amazon and Walmart Market Capitalization, 1997–2017 (billions USD)

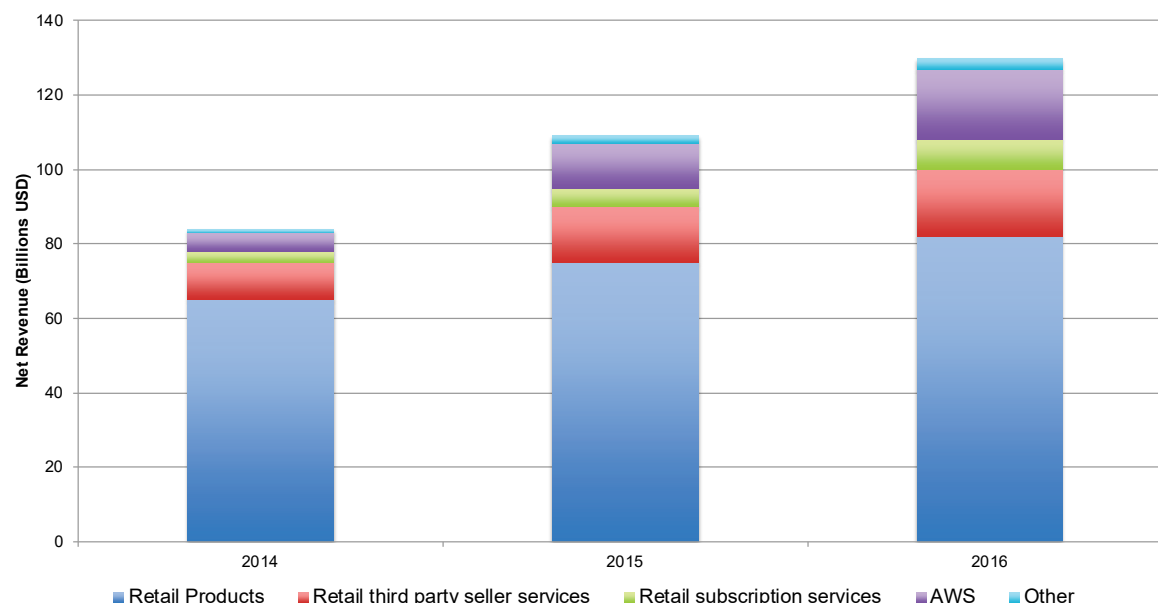
Source: Casewriter; compiled from Capital IQ.

Exhibit 2 Amazon Financials, 2006–2017 (millions USD)

Fiscal Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Income statement											
Total revenue	14,835	19,168	24,509	34,204	48,077	61,093	74,452	88,988	107,006	135,987	177,866
North America	8,095	10,288	12,828	18,707	26,705	34,813	44,517	50,834	63,708	79,785	106,110
International	6,740	8,938	11,681	15,497	21,372	26,280	29,935	33,510	35,418	43,983	54,297
Amazon Web Services	NA	NA	NA	NA	NA	NA	NA	4,644	7,880	12,219	17,459
Cost of Goods Sold	(11,482)	(14,896)	(18,978)	(25,561)	(37,288)	(45,971)	(54,181)	(62,752)	(71,651)	(88,265)	111,934
Gross Profit	3,353	4,270	5,531	7,643	10,789	15,122	20,271	26,236	35,355	47,722	65,932
Gross Margin	22.6%	22.3%	22.6%	22.3%	22.4%	24.8%	27.2%	29.5%	33.0%	35.1%	37.1%
SG&A Expenses	(1,871)	(2,419)	(3,060)	(4,397)	(6,864)	(9,723)	(12,647)	(16,650)	(20,411)	(27,284)	(38,992)
SG&A over Revenue	12.6%	12.6%	12.5%	12.9%	14.3%	15.9%	17.3%	18.7%	19.1%	20.1%	21.9%
Operating Income	635	789	1,180	1,406	862	676	745	178	2,233	4,186	4,106
North America								360	1,425	2,361	2,837
International								(640)	(699)	(1,283)	(3,062)
Amazon Web Services	NA	NA	NA	NA	NA	NA	NA	458	1,507	3,108	4,331
Operating Margin	4.4%	4.1%	4.8%	4.1%	1.8%	1.1%	1.0%	0.2%	2.1%	3.1%	2.3%
Net Income	476	645	902	1,152	631	(39)	274	(241)	596	2,371	3,033
Distribution											
Shipping Revenue	740	835	924	1,193	1,552	2,280	3,097	4,486	6,520	8,976	NA
Shipping Cost	(1,174)	(1,465)	(1,773)	(2,579)	(3,989)	(5,134)	(6,635)	(8,709)	(11,539)	(16,167)	(21,700)
Fulfillment Cost	1,292	1,658	2,052	2,898	4,576	6,419	8,585	10,766	13,410	17,619	25,249
Balance Sheet											
Total Cash & ST Inv.	3,112	3,727	6,368	8,762	9,576	11,448	12,447	17,416	19,808	25,981	30,986
Inventory	1,200	1,399	2,171	3,202	4,992	6,031	7,411	8,299	10,243	11,461	16,047
Total Current Assets	5,164	6,157	9,797	13,747	17,490	21,296	24,625	31,327	35,705	45,781	60,197
Total Assets	6,485	8,314	13,813	18,797	25,278	32,555	40,159	54,505	64,747	83,402	131,310
Total Current Liabilities	3,714	4,746	7,364	10,372	14,698	19,002	22,980	28,089	33,887	43,816	57,883
Long-Term Debt	1,282	409	109	184	255	3,084	3,191	8,265	8,227	7,694	24,743
Total Liabilities	5,288	5,642	8,556	11,983	17,521	24,383	30,413	43,764	51,363	64,117	103,601
Working Capital	1,450	1,411	2,433	3,375	2,594	2,294	1,645	3,238	2,575	1,965	2314
Total Equity	1,197	2,672	5,257	6,654	7,757	5,192	9,746	10,741	13,384	19,285	27,709
Cash Flow Statement											
Cash from Operations	1,405	1,697	3,293	3,495	3,903	4,180	5,475	6,842	12,039	17,272	18,434
Capital Expenditure	(224)	(333)	(373)	(979)	(1,181)	(3,765)	(3,444)	(4,893)	(5,387)	(7,804)	(11,955)
Cash Acquisitions	(75)	(494)	(40)	(352)	(705)	(745)	(312)	(979)	(795)	(116)	(13,972)
Cash from Investing	42	(1,199)	(2,337)	(3,360)	(1,930)	(3,595)	(4,276)	(5,065)	(6,450)	(9,876)	(27,819)
Issue of Common Stock	91	11	0	0	0	0	0	0	0	0	0
Net Debt Issued	(50)	(260)	(385)	(78)	(267)	2,790	(617)	4,426	(3,882)	(3,740)	9,860
Net Change in Cash	1,517	230	675	333	1,492	2,815	574	5,899	1,333	3,444	1,188
Number of employees	17,000	20,700	24,300	33,700	56,200	88,400	117,300	154,100	230,800	341,400	566,000

Source: Amazon financials, Capital IQ, Inc., a division of Standard & Poor's cited by John R. Wells, Galen Danskin, Gabriel Ellsworth, "Amazon.com, 2016," HBS No. 716-402 (Boston: Harvard Business School Publishing, rev. 2016), <https://cb.hbsp.harvard.edu/cbmp/product/716402-PDF-ENG>, accessed December 2017.

Note: Amazon's fiscal year ended on December 31. Amazon raised \$50 million in an IPO in 1997; all other issuances were for employees. Disclosure of Amazon Web Services revenue began in 2014.

Exhibit 3a Amazon Global Net Revenue 2014–2016 (billions USD)

Source: Casewriter. Amazon Global Net Revenue from Statista, "Global net revenue of Amazon.com from 2014 to 2016, by segment (in billion U.S. dollars)," <https://www.statista.com/statistics/672747/amazons-consolidated-net-revenue-by-segment/>, accessed December 2017.

Note: Retail third-party seller services are fees charged third parties for listing and distributing their products. Retail subscription services are primarily Prime subscriptions. AWS is Amazon Web Services.

Exhibit 3b Amazon Gross Merchandise Value (GMV) 2015–2016 (billions USD)

Category	U.S. E-Commerce Total	Amazon Share of U.S. E-Commerce		Amazon GMV	
	2016	2015	2016	2016	% of Total
Apparel & Accessories	\$61,960	20%	28%	\$17,039	11%
Books & Magazines	11,241	70%	70%	7,868	5%
Computer	98,866	65%	70%	69,206	46%
Consumer Goods	30,105	45%	53%	15,805	10%
Event Tickets	22,886	0%	0%	0	0%
Flowers & Gifts	5,741	15%	18%	1,005	1%
Furniture & Appliances	15,469	10%	13%	1,934	1%
Home & Garden	10,329	20%	23%	2,324	2%
Jewelry & Watches	8,886	20%	23%	1,999	1%
Music, Movies & Videos	5,678	70%	70%	3,975	3%
Office Supplies	14,810	15%	23%	3,332	2%
Sports & Fitness	7,337	25%	28%	2,018	1%
Toys & Hobbies	9,080	50%	53%	4,767	3%
Other	61,831	29%	32%	19,878	13%
Total	\$364,219	37%	41%	\$151,150	100%

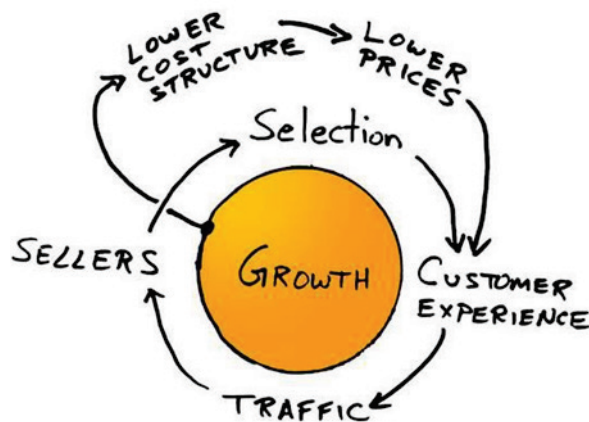
Source: Amazon Gross Merchandise Value is a casewriter summary of JP Morgan Analyst Report, May 17, 2017.

Note: The Gross Merchandise Value includes the actual retail value of product sold by third-party retailers, who only pay Amazon a 15% fee plus fulfillment costs.

Exhibit 4 Amazon's Innovations, Active and Abandoned, 1995–2017

Year	Innovation (year abandoned, if applicable)
1995	Customer reviews
1997	1-Click ordering; Recommendations
1999	Wish lists; Electronic store; Amazon Auctions (abandoned 2000); zShops (abandoned 2007)
2001	"Where's My Stuff?"
2002	Free shipping
2003	Marketplace
2004	A9 search portal (abandoned 2008)
2005	Amazon Prime; Private labels
2006	Elastic Compute Cloud web service; Fulfillment by Amazon; Askville (abandoned 2013); Unbox (abandoned 2015)
2007	Subscribe & Save; Amazon Kindle; Amazon Music; AmazonFresh; Endless.com (abandoned 2012); Amazon WebPay (abandoned 2014)
2009	Local Express Delivery (same day); PayPhrase (abandoned 2012)
2010	Price Check; Amazon Studios; Webstore (abandoned 2016)
2011	Appstore for Android; Kindle Owners' Lending Library; Amazon Lockers; MyHabit (abandoned 2016); Amazon Local (abandoned 2015); Test Drive (abandoned 2015)
2012	Amazon Media Group; Music Importer (abandoned 2015); AmazonSupply (later Amazon Business)
2013	Exclusive Prime Instant Video; Sunday delivery; Anticipatory shipping; Kindle Mayday; AmazonSmile
2014	"Flow" image recognition in mobile app; Amazon Prime New (1-2 hours); Prime Pantry; Fire TV; Fire Phone (abandoned 2015); Amazon Elements diapers (abandoned 2015); Prime Photos; Prime Music; Amazon Local Register (abandoned 2015); Amazon Wallet (abandoned 2015)
2015	Amazon Echo; Dash Buttons; Amazon Launchpad; Amazon bookstore; Amazon Destinations (abandoned 2015); Amazon Restaurants; Handmade at Amazon; Amazon Home Service
2016	Prime Air; Amazon Go; Wickedly Prime; Apparel private label
2017	Amazon STEM Club; Amazon Chime; Echo Look; Echo Chime

Source: Adapted by casewriter from Bain Analysis of Amazon.com cited in Darrell K. Rigby, "The Amazon-Whole Foods Deal Means Every Other Retailer's Three-Year Plan Is Obsolete," *Harvard Business Review*, reprint H03QOS published on HBR.org, June 21, 2017, p. 4, <https://cb.hbsp.harvard.edu/cbmp/content/sample/H03QOS-PDF-ENG>, accessed December 2017.

Exhibit 5 Amazon's Virtuous Circle

Source: Cited in Sam Seely, "The Amazon Flywheel: Part 1," May 2, 2016, <http://www.samseely.com/blog/2016/5/2/the-amazon-flywheel-part-1>, accessed December 2017.

Exhibit 6 Walmart Financials

Fiscal Year	2012	2013	2014	2015	2016	2017	2018
Net Sales	443,854	466,114	473,076	482,229	478,614	481,317	495,761
International	125,435	134,748	136,513	136,160	123,408	116,119	118,068
United States	264,186	274,433	279,406	288,049	298,378	307,833	318,477
Sam's Club	53,795	56,423	57,157	58,020	56,828	57,365	59,216
U.S. eCommerce	NA	NA	NA	NA	NA	8,000	11,500
Sales per Sq. Ft.	428	435	430	425	417	413	428
<i>Net Sales Growth (decline)</i>	<i>5.9%</i>	<i>5.0%</i>	<i>1.5%</i>	<i>1.9%</i>	<i>(0.8)%</i>	<i>0.6%</i>	<i>3.0%</i>
<i>U.S. Same-Store Sales Growth (decline)</i>	<i>0.3%</i>	<i>2.0%</i>	<i>(0.6)%</i>	<i>0.5%</i>	<i>1.0%</i>	<i>1.4%</i>	<i>2.2%</i>
Cost of Sales	335,127	352,488	358,069	365,086	360,989	361,256	373,396
SG&A Expenses	85,265	88,629	91,353	93,418	97,041	101,853	104,698
Net Income	15,699	16,999	16,022	16,363	14,697	13,643	9,862
Current Assets	54,975	59,940	61,185	63,278	60,239	57,689	59,664
Inventory	40,714	43,803	44,858	45,141	44,469	43,046	43,783
Total Assets	193,406	203,105	204,751	203,490	199,581	198,825	204,522
Total Liabilities	117,241	120,848	121,921	117,553	115,970	118,290	123,700
Long-Term Debt	44,070	38,394	41,771	40,889	38,214	36,015	30,045
Shareholders' Equity	76,165	82,257	82,830	85,937	83,611	80,535	80,822
<i>Return on Assets</i>	<i>8.4%</i>	<i>8.7%</i>	<i>8.2%</i>	<i>8.3%</i>	<i>7.5%</i>	<i>7.1%</i>	<i>6.9%</i>
<i>Return on Shareholders' Equity</i>	<i>21.2%</i>	<i>22.4%</i>	<i>20.1%</i>	<i>19.9%</i>	<i>18.1%</i>	<i>17.2%</i>	<i>12.7%</i>

Source: Adapted by casewriter from David B. Yoffie and Eric Baldwin, "Wal-Mart Update, 2017," HBS No. 717-468 (Boston, MA: Harvard Business Publishing, 2017), originally using data from Thomson One/Reuters and Wal-Mart Form 10-K and 10-Q. US eCommerce data from Walmart Fourth Quarter Fiscal Year Earnings," February 20, 2018, 8; http://s2.q4cdn.com/056532643/files/doc_financials/2018/q4/Q4FY18-Combined-Doug-and-Brett-final.pdf.

Exhibit 7 Wal- Mart Sales Mix in 2012

Category	Proportion of Sales (2012)
Grocery	56%
Entertainment	12%
Health & Wellness	11%
Hard Goods (e.g., Toys)	11%
Apparel	8%
Home Goods (e.g. Furniture)	5%

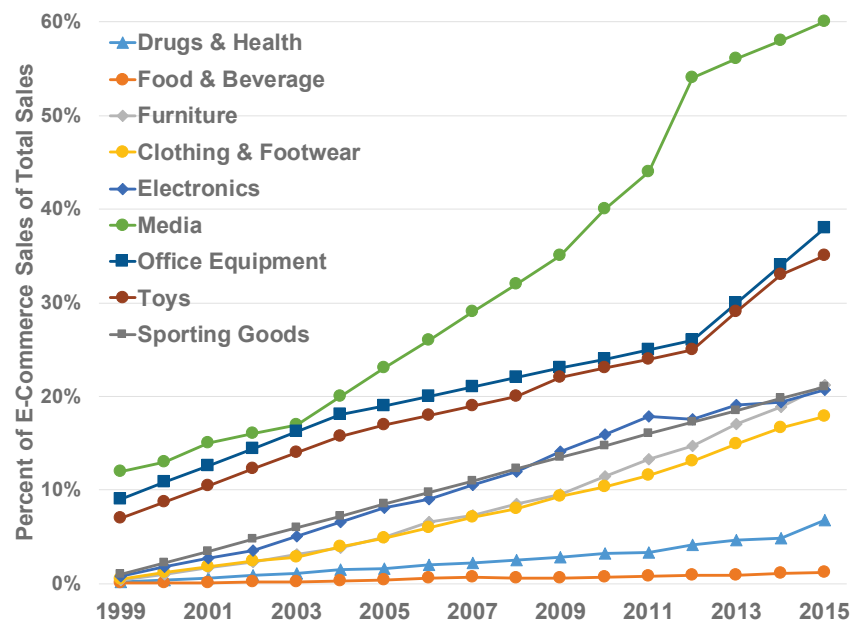
Source: Wal-Mart Stores 2012, 10K.

Exhibit 8 Important Walmart (and Jet.com) Acquisitions, 2010–2017

Announced Date	Target	Description	Size (\$ millions)
October 2017	Parcel Inc.	Technology-based, same-day, and last mile delivery company that specializes in perishable and non-perishable delivery.	-
June 2017	Bonobos, Inc.	Online clothing focused on menswear	310.0
	Moosejaw	Outdoor retailer	50.0
	Shoebuy.com	Online shoe retailer	70.0
	Hayneedle.com	Online furniture retailer	90.0
August 2016	Jet.com Inc.	E-commerce retailer, founded by Marc Lore	3300.0
July 2015	Niuhai E-commerce (Shanghai) Co., Ltd	Chinese B2C website: clothes, grocery products, and consumer electronics.	760.0
April 2011	Kosmix Corporation (aka: Walmart Labs, Inc.)	Platform to filter social network content to connect people with real-time information	300.0
February 2010	VUDU, Inc.	Delivers entertainment content directly to broadband high-definition TVs	-

Source: Compiled by casewriter.

Note: Niuhai E-commerce (Shanghai) Co., Ltd was sold to JD.com in 2016.

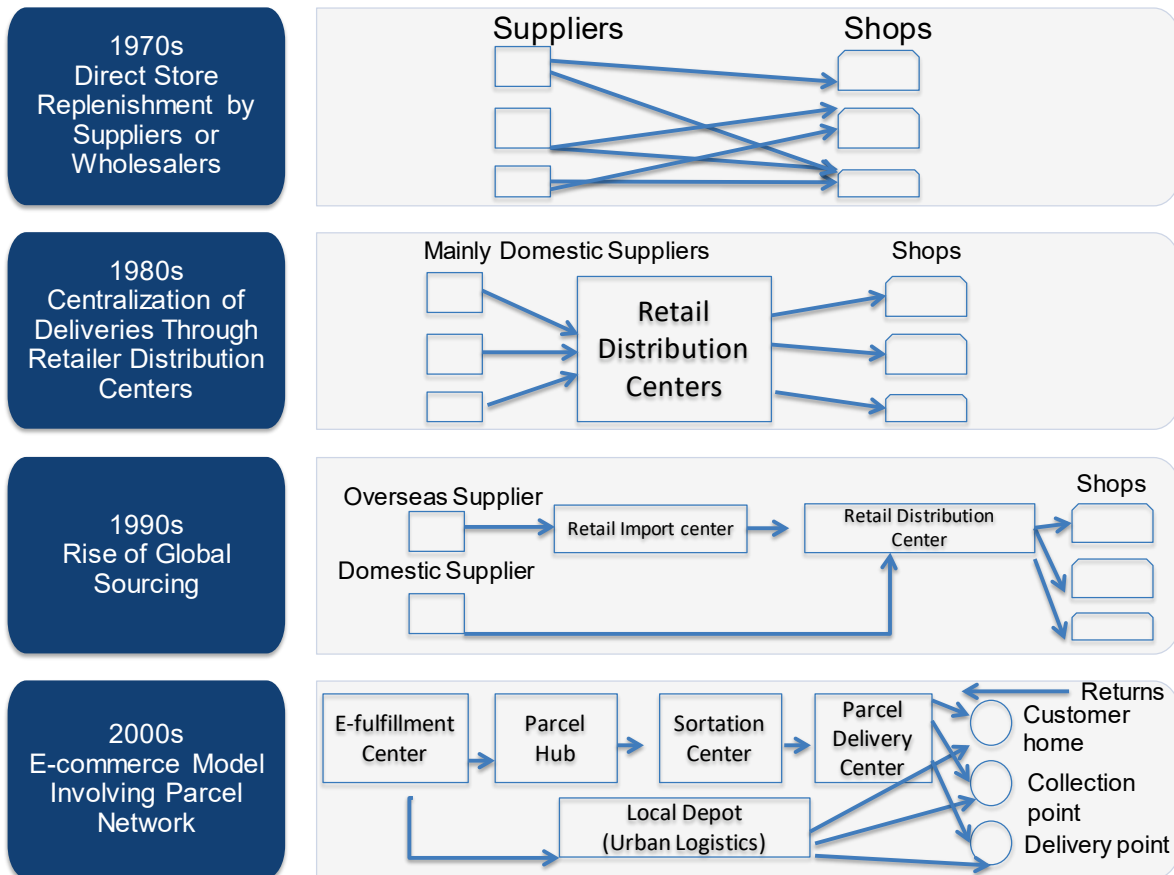
Exhibit 9 Selective E-Commerce Percentage of Total US Sales over Time (1999–2015)

Source: Casewriter estimates based on Drugs & Health, Food & Beverage, Furniture, Clothing & Footwear, and Electronics data are from U.S. Census E-Commerce Statistics (E-STATS) multi-sector data tables, 2016. Media, Office Equipment, Toys, and Sporting Goods are from *The Economist* October 28th, 2017, E-Commerce Special report (derived from Cowen and Company; U.S. Census Bureau).

Exhibit 10 How Much Higher – or Lower – Select Retailers’ Online Prices Are than Amazon’s (52,000 products), 2017

% Difference from Amazon	Appliances	Baby	Electronics	Furniture	Music	Office Electronics	Pet Supplies	Home Improvement	Sports	Toys & Games	Video Games	Vitamins	Beauty	
Walmart		4	1	7	1.7	2	5	2	0.4	6	4	5	4	-1
Target		12	12	17	22	20	29	19	9	NA	12	23	NA	6
Jet		9	14	9	12	4	23	16	14	14	14	11	11	8

Source: Catey Hill, “What NOT to buy at Amazon, Walmart and Target—according to study of 52,000 items,” Moneyish, October 30, 2017, <https://moneyish.com/hoard/what-not-to-buy-at-amazon-walmart-and-target-according-to-study-of-52000-items/?link=mkwtw>, accessed May 29, 2018.

Exhibit 11 Evolution of Retail Logistics, 1970s–2000s

Source: Casewriter. Adapted from Adam Robinson, "E-Commerce Logistics: The Evolution of Supply Chains from Direct to Store Models to E-Commerce," Cerasis.com, April 30, 2014, <http://cerasis.com/2014/04/30/e-commerce-logistics/>, accessed December 2017.

Exhibit 12 Four Routes to the Home

Traditional bricks and mortar retail: Goods delivered from manufacturing factory to retail distribution center warehouse. From this center, goods trucked to retail store, placed on shelves by employees, then picked up by consumer, paid for at checkout, and taken home by consumer. J.C. Penney CEO Marvin Ellison noted, “It’s always cheaper to ship from a distribution facility to a store than to a consumer.”

Online retail: Goods delivered from factory to online fulfillment center, where it was picked by an employee and packaged for direct home shipping. A logistics company (FedEx, UPS, or USPS) then takes the items; their operations included a sort facility at origination point for long haul transport (generally by plane) to sort facility near destination, then delivered to a home in a van. Faster than usual two-day delivery or for fresh goods required a fulfillment center close to the customer, with the actual delivery performed by a local service provider (e.g., courier, Uber/Lyft driver).

Buy online, pick up in store (BOPIS): Also known as “click and collect.” An item followed the traditional bricks and mortar routing until it reached the store, where it was placed in a separate part of the store, then picked by an employee who passed it to the consumer at a dedicated pickup point. In 2017, 78% of consumers had used this mode in the last six months, 21% used it regularly.

Manufacturer dropship: Manufacturers increasingly avoided the retailers’ own distribution networks, through direct consumer orders with the manufacturer or drop shipping by the manufacturer of online retail purchases. For example, paper towels could be packaged for home delivery at the manufacturer’s factory or warehouse and delivered directly to the consumer by FedEx or UPS.

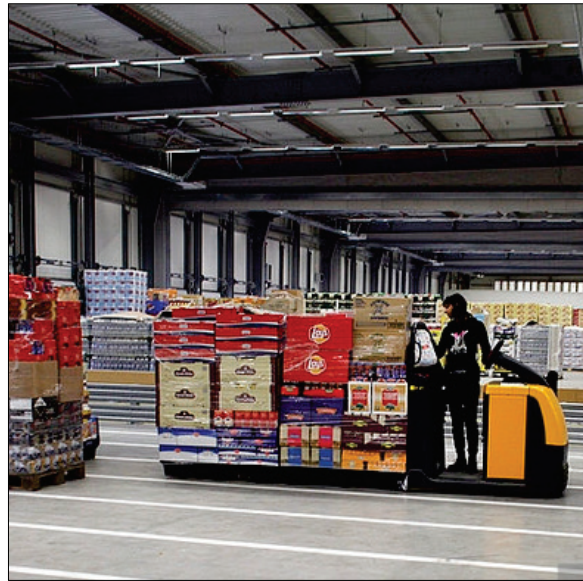
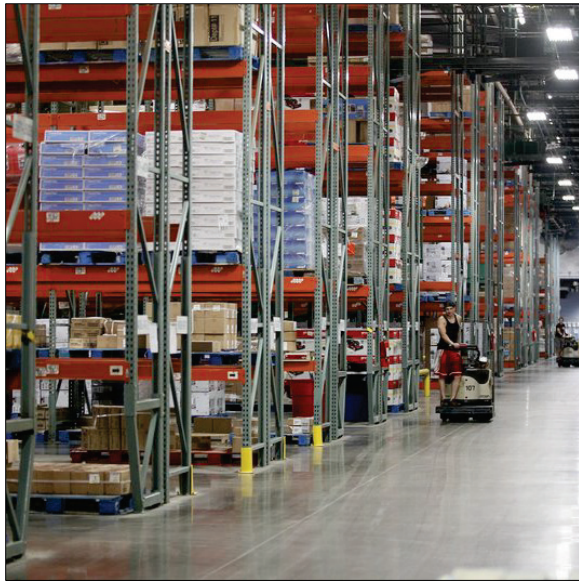
Source: The data on consumers buying online and picking in stores comes from Glenn Taylor, “NRF: 78% of Consumers Shop in Stores as Often as Last Year,” *Retail Touchpoints*, <https://www.retailtouchpoints.com/features/news-briefs/nrf-78-of-consumers-shop-in-stores-as-much-as-last-year>, accessed June 6, 2018.

Exhibit 13 Comparative Cost Structure in US (\$120 assortment of non-grocery goods)

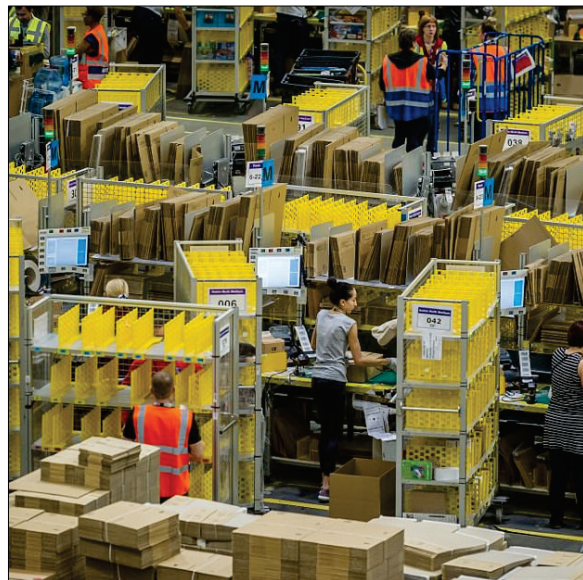
Amazon	\$	%	Walmart	\$	%
Revenue	120	100.0	Revenue	120	100.0
COGS		69.6	COGS		68.2
Marketing		3.9	Marketing		0.5
SG&A		1.8	SG&A		2.3
IT		3.5	IT		1.0
Fulfillment		9.5	Logistics		2.5
Shipping (3 rd party)		2.7	Store		2.0
Shipping (in-house)		6.0	Labor		12.9
Operating Income		3.0%	Operating Income		10.6%

Source: Casewriter estimates.

Note: \$120 is the average value of a single Amazon delivery package and is for Amazon’s own retail offerings. Product mix will differ between Walmart and Amazon. Amazon shipping costs as defined in their accounts “include sortation and delivery centers and transportation costs”; fulfillment costs are “primarily costs incurred in operating and staffing our North America and International fulfillment and customer service centers and payment processing costs.”

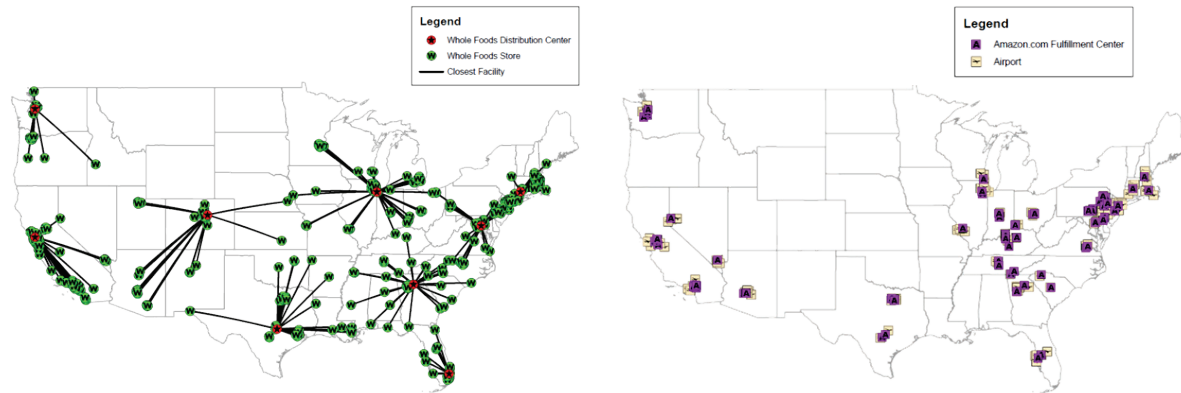
Exhibit 14a Walmart (left) and Lidl (right) Distribution Centers

Source: Walmart distribution center from Fortune, June 2, 2016. <http://fortune.com/2016/06/02/walmart-drones-warehouses/>. Accessed January 2018. Lidl distribution center from Getty Images, March 14, 2014. Accessed January 2018.

Exhibit 14b Amazon Fulfillment Centers

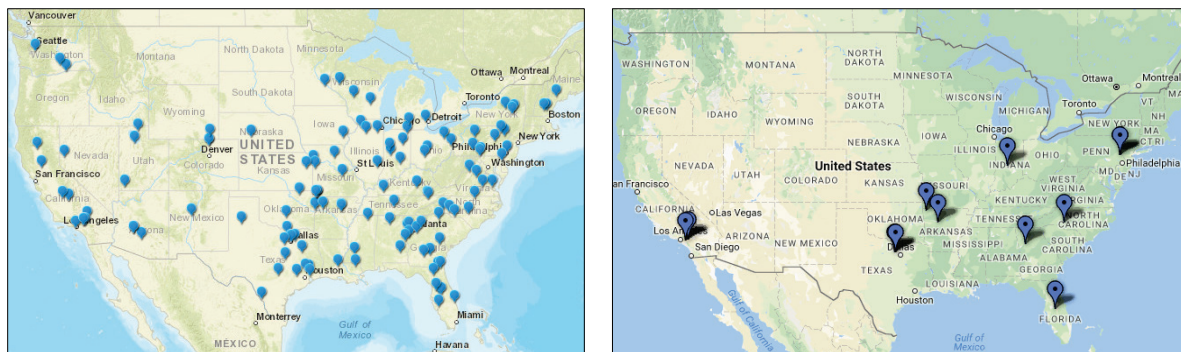
Source: Left image from KQED June 29, 2011, <https://ww2.kqed.org/news/2011/06/29/california-affiliates-tweeting-amazon-threatening-to-terminate/>, accessed January 2018. Right image from Daily Mail, November 2017, <http://www.dailymail.co.uk/news/article-5111119/Amazon-s-new-warehouse-prepares-busiest-Black-Friday.html>, accessed January 2018.

Exhibit 15 Whole Foods Distribution Center and Stores (left) and Amazon Fulfillment Centers (right), 2016



Source: Alex Evans, "The Everything Warehouse," Medium.com, June 25, no year, <https://medium.com/@ahe4nc/the-everything-warehouse-9bdcf94446ff>, accessed December 2017.

Exhibit 16 Walmart Distribution (left) and E-Commerce Fulfillment Centers (right) in U.S. (2016)



Source: Walmart distribution centers created in ArcGIS (last update 2016), <http://www.arcgis.com/home/webmap/viewer.html?webmap=d5a46f348c55468d87e57288de6e4372>, accessed December 2017. Walmart e-commerce fulfillment centers map created by case writer in Google Fusion Tables (last updated April 2017), MWPVL International Inc. "The Walmart Distribution Center Network in the United States," no date, <http://www.mwpvl.com/html/walmart.html>, accessed December 2017.

Exhibit 17 Walmart and Amazon Customer Demographics, 2015

	Walmart	Walmart.com	Amazon	Amazon Prime
Average Household Income (\$)	56,000	61,000	62,900	69,300
Household Income (%):				
<\$24,999	22	18	18	14
\$25,000–\$49,999	33	30	30	27
\$50,000–\$74,999	22	24	23	24
\$75,999–\$99,999	12	15	14	15
\$100,000–\$149,999	8	10	11	13
>\$150,000	3	4	5	6
Median Age (years)	42.2	37.8	40.2	36.5

Source: Capital IQ, Cowen and Company Survey, December 3, 2015.

Exhibit 18 Walmart and Amazon Asset and Activity Comparison

	Walmart U.S. (excluding Sam's Clubs)	Amazon
Employees	1.5 million in US (2.3 million worldwide)	542,000 worldwide including Whole Foods
Physical stores	4,672 with 700 million square feet; 3500 supercenters	13 Amazon Books; 1 Amazon Go; 456 Whole Foods
Distribution centers	147 (include Sam's club and all kind of distribution facilities)	Included in fulfillment centers
Fulfillment centers	15 large, dedicated and many partial conversions	299 warehouses of all forms in U.S.
Distribution area (total sq. ft.)	130 million	70 million plus 18 million fresh food
Airplanes	For Distribution use: 0 For Corporate Traffic: 20	40 Prime Air Cargo Planes
Trucks and trailers	Approximately 6,000-6500, 55,000 trailers	4,000 trailers, 0 trucks
Logistics partners	12 transportation companies; Uber	UPS; Fedex; USPS
Online SKUs	38 million, 2 million for free two day delivery	536 million; 30 million Prime Products
Third-party SKUs	67,000,000	Around 500 million
Private label SKUs	9,000–12,000	1,453 Amazon Basics SKUs, 10–20,000 SKUs overall
Pickup points	1,000 for Grocery pickup 4,672 for general merchandise can be picked up at any stores	22 Instant Pickup Points; 1,800 Amazon lockers
Method of last-mile delivery	Acquired Parcel to offer same day delivery; partner with Uber; encourage employee to deliver; acquired August Smart Lock to give couriers access to homes	USPS; Fedex; UPS; Amazon Flex; Local Delivery Companies through Amazon Logistics; Amazon Key remote entry
Locations for two-hour delivery	Begin in New York City. Introducing "dark stores" in China	About 30 major cities

Source: Casewriter research, see Endnote 69.

Exhibit 19 Walmart and Amazon Service Comparison

	Walmart U.S. (excluding Sam's Clubs)	Amazon
Voice ordering	Partnership with Google	Echo (Alexa)
Automatic reordering	Patented technology to automatically reorder and suggest additional products based on sensors placed on products	Dash Buttons; Amazon auto-ordering
Free shipping	2 day with \$35 minimum purchase and items somewhat limited, 3–5 day with \$35 minimum purchase	\$99 Prime membership allows free two-day shipping on any order
Shipping fees: 2 hour	NA, testing \$7–10 delivery by Uber or Lyft	Prime Now (25,000 products) free; 1 hour \$7.99. Available in dozens of cities
Shipping fees: Same day	NA	Prime Now free
Shipping fees: Next day	NA	Free for select Prime products
Shipping fees: Two day	Two-day shipping requires no fee for 2 million items. No fee for orders over \$35	Free with Prime for 40 million items
Pickup pricing	Free	NA
Additional Services	Streaming video services	Prime includes Amazon Music and Video Streaming; Prime Photos; Family; Kindle lending library; and <i>Washington Post</i> subscription
Pharmacy	Walmart Pharmacy and online ordering for pick up in store or home delivery	None, but entry likely.

Source: Casewriter research, see Endnote 69.

Endnotes

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