

Amazon Value Chain Analysis

A quick analysis based on publicly-available information

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Safe Harbor Statement



Analysis information provided in this document is based only on publicly-available information, judgments, and associated assumptions. Individual assumptions may or may not be accurate. Assumptions that are inaccurate could lead to incorrect analysis conclusions. The information is provided to further discussion and should not be used for decision-making, without further validation.

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Commentary



The following commentary also appears on www.worldlocity.com

Amazon is the juggernaut retail corporation of our day and there is much interest in how they do things. Just about every retailer in the world has had to come to grips with how to address Amazon's onslaught. Walmart, the world's largest retailer, is bound and determined to not have Amazon do to them what Walmart did to Sears, Kmart, and others. Retailers lament that Amazon runs a high-growth, zero-profit business model, and is rewarded for doing so by the investment community, while these same retailers are held to a different set of rules by the same investment community. Amazon's answer to this is that they just focus on customers, providing ever more innovative ways to serve customers; everything else just flows from that focus. The investment community says that Amazon could turn into an incredible profit engine at any time. But is this true, and if so, how will they do it?

Using only information available in Amazon's 10K reports, and making some basic assumptions and calculations, Worldlocity has assembled a profile of Amazon's business, in the form of a value chain chart, which is shown on the following slide. For this analysis, we separated Amazon's business into two segments: 1) their retail products business; and 2) their services business. Their retail products business includes all physical product sales for which they own the inventory, along with various digital products sales, which are downloadable. Their services business includes retail third-party product sales for which they get commissions and fees, and also includes subscription services, Amazon Web Services (AWS), and certain advertising and co-branding products.

One caveat: this analysis relies on assumptions and cost allocations, for which there is no publicly available information. Having said that, while the numbers lack precision, they are most likely directionally correct. This analysis shows that Amazon, on an operating basis, loses about 2 cents for every dollar of products it sells using its traditional selling model in which it owns the product inventory, while it makes roughly 15 cents for every dollar it sells through its services business (which includes AWS, which has operating margins of 25%). The net result of the two is that Amazon overall makes about 3 cents in operating profit for every 1 dollar it sells overall. (If readers of this analysis disagree or have better data to improve it, please contact Worldlocity). Thus, it's the business innovations that resulted from the original business model that are the profit engines now, and possibly into the future. It's difficult to see how the original business model, given its cost structure, can make money comparable to that of a traditional retailer (without some combination of price increases, cost reductions, and service reductions).

This of course poses significant challenges for traditional retailers, who do not have a marketplace operation or an AWS to subsidize their product-based ecommerce. Thus, they will have to subsidize it out of their brick-and-mortar operations, diluting the margins there. Walmart is rapidly trying to ramp up its third-party marketplace operation, not just to match the choice of Amazon, but presumably to also provide fatter margins.

Finally, Amazon's supply chain is a cash-generation machine, with a 2016 cash-to-cash cycle of approximately minus 35; this equates to about \$13B in cash on a 2016 end-of-year revenue basis (a more precise calculation would time-phase it over the year of 2016). This money float, courtesy of its supply chain, is one of the critical flywheels of the Amazon success story. In a sense, it is not unlike the float on insurance premiums that Warren Buffet has historically used as an investment vehicle. It's a powerful statement for supply chain management.

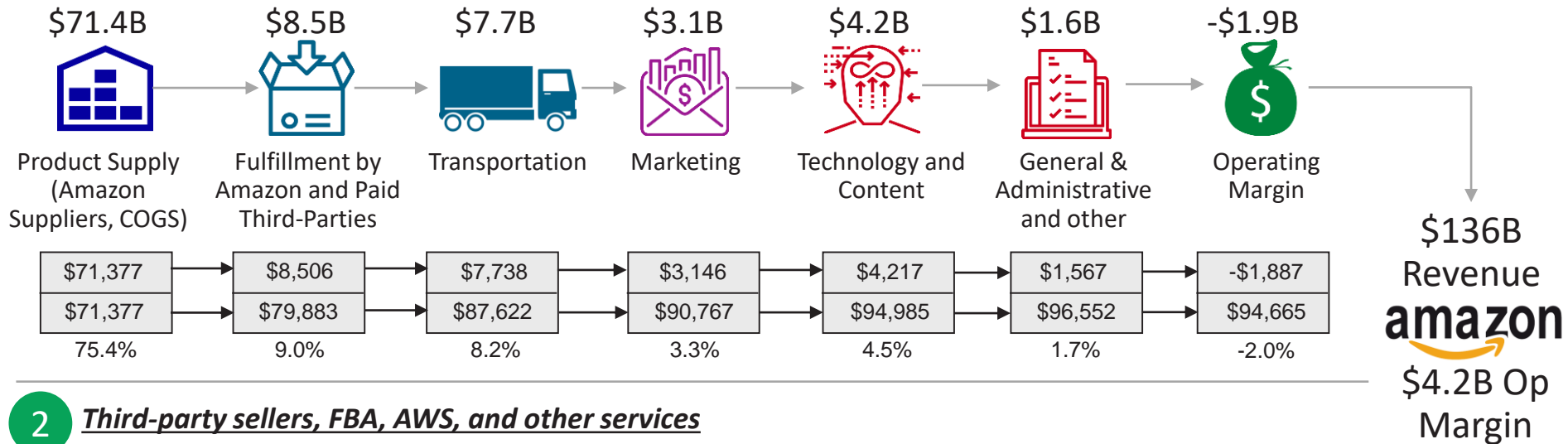
The net-net is that Amazon manages its business around cash flow, rather than bottom-line profit and profit margins. Its cash flow from operations in 2016 was \$16.4B, and its free cash flow was \$9.7B.

Amazon Value Chain Analysis

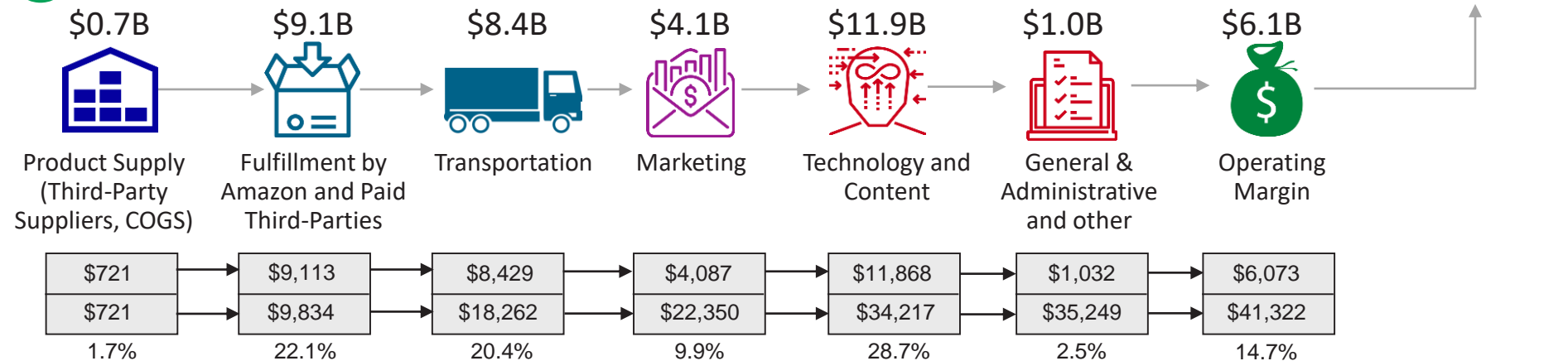
Amazon and third-party products (2016)



1 Amazon sold and managed products (inventory owned by Amazon)



2 Third-party sellers, FBA, AWS, and other services



Amazon Value Chain Analysis

Notes and comments



1. The source of this analysis is Amazon's 2016 10K and estimates by WorldLocity.
2. Amazon's 10K and other publicly-available information do not provide cost splits between the two value chains shown in the diagram. Furthermore, it's difficult to allocate certain costs to different streams since they are highly operationally commingled.
3. In order to provide cost splits between value chains, triangulation was done from a number of a couple of different perspectives:
 1. The first methodology attempted to derive third-party product gross revenue and then apportion fulfillment and transportation costs based on pro rata splits of the total gross product revenue that flows through Amazon's supply chain.
 2. The second methodology uses an average of the product sales (Amazon-owned inventory) and COGs (net of shipping costs) growth rates from 2011-2016 and assumes that the incremental growth in costs of fulfillment and transportation above this rate would largely be attributable to third-party product sales that use FBA. This is highly likely to be the case with the exception that Amazon was building sortation centers (included in shipping costs) rapidly in this timeframe and that portion of shipping costs would benefit both value streams.
 3. The resultant value chain chart is based on the second of the above two methodologies.
4. Cost of goods (product costs or cost of sales net of shipping costs) is a key anchor for deriving numbers for the two value streams. Based on its definition, it would make sense to attribute 100% of these costs to the product value chain. However, it is assumed that the services value chain has some nominal COGS associated with packaging, sortation equipment and other materials. For the purposes of this analysis, it is assumed that 1% of total COGS is attributable to the services value chain.
 1. This has a big impact on the operating profit of the product value chain. If 100% of COGS is attributable to the product value chain or if the services chain consumes more than 1% of COGS, then the associated operating profit delta shifts from one chain to the other.
5. Fulfillment and transportation (shipping) cost allocation assumptions are as follows:
 1. Using 2011 costs as a starting point, fulfillment and transportation costs are projected forward at a CAGR that is the average of the five year CAGR for product sales and COGS (net of transportation). This average is 17.2%. The idea is that if product sales were a standalone business, then fulfillment and transportation would grow in lockstep with product sales and COGS. As discussed above, it is assumed that all costs in 2016 above this rate, are assumed to be costs incurred by the services value chain.
 2. To account for the fact that services sales have a starting point in 2011, (thus a portion of the cost structure in 2011 was already going to services) it is assumed that in 2011, 35% of units sold through amazon.com were third party, and that the average price of these units was comparable to Amazon product units. (The Amazon 2009 10K stated that 30% of units were third-party units). It is further assumed that 35% of these units used FBA, thus consuming supply chain costs. (FBA was first introduced in 2006).
6. Marketing cost allocation assumptions are as follows:
 1. Marketing cost splits are computed in a manner comparable to computations used to derive the splits for fulfillment and transportation.
7. Technology and content cost allocation assumptions are as follows:
 1. Technology and content cost splits are computed in a manner comparable to computations used to derive the splits for fulfillment and transportation, with the exception that a higher starting point reduction factor is used for the product value chain to account for the investment in AWS. (AWS operating costs are all found in the technology and content category).
8. General and administrative, and other costs allocation assumptions are as follows:
 1. G&A cost splits are computed in a manner comparable to the computations used to derive the splits for fulfillment and transportation.

Amazon Value Chain Analysis

Key insights



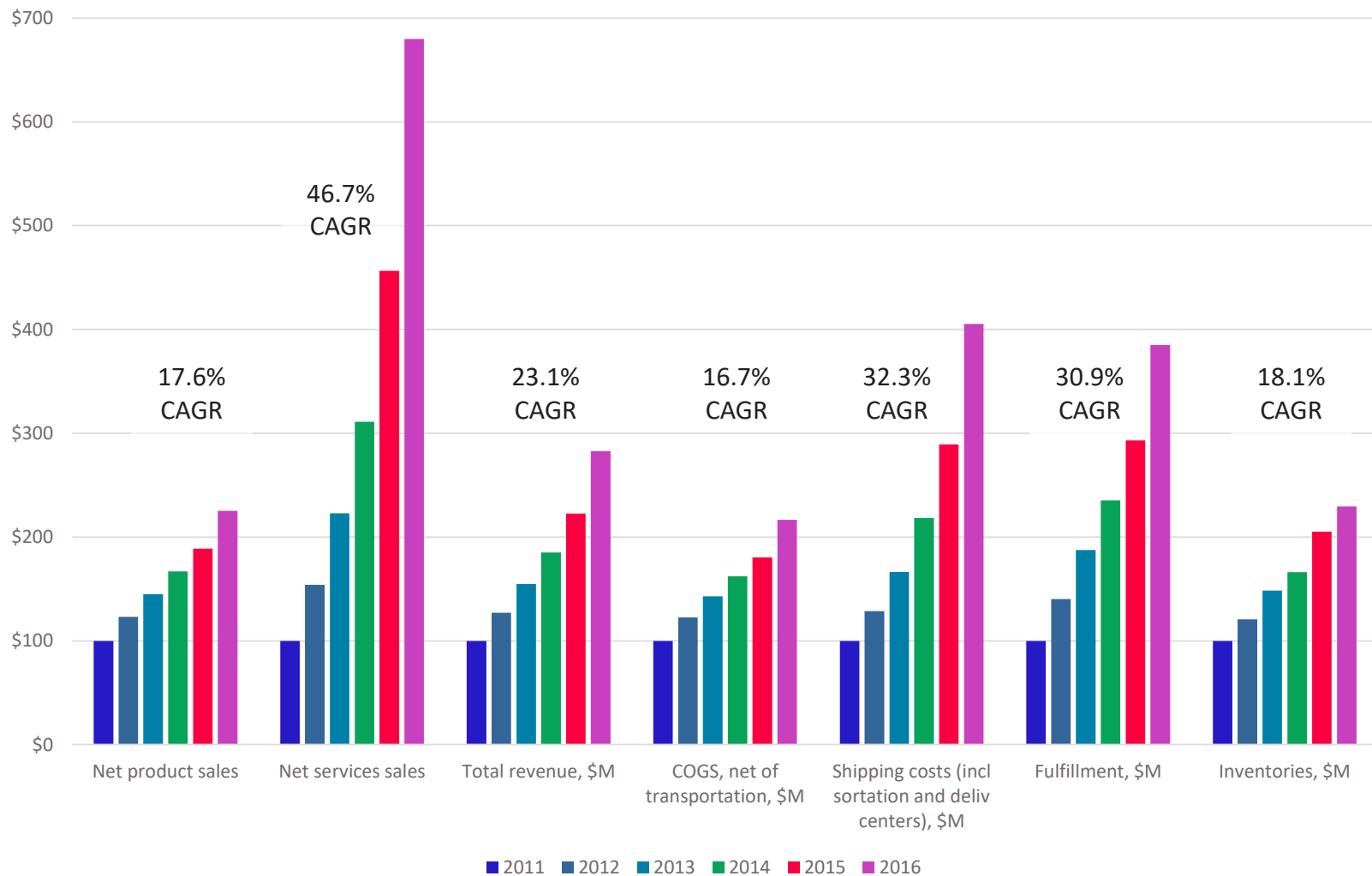
- > The cost splits between the value chains could swing either way based on assumptions, but are likely to be directionally correct
- > Based on this analysis, the implied gross revenue handled by the Amazon supply chain in 2016 was \$204B; third-party gross revenue was roughly \$109B, representing 54% of the total
- > FBA fees average about 21% or 21 cents for every dollar of third-party gross revenue
- > While Amazon product revenue (Amazon-bought and owned inventory) had a 17.6% CAGR between 2011-2016, third-party gross revenue had a 37% CAGR
 - This shows consistency with overall services revenue growth of 46.7% since AWS was growing even faster over the same timeframe. It also shows consistency with third-party seller services growth of 40% between 2014-2016 (Amazon started breaking out AWS and third-party seller services revenue in 2014)
- > While the product value chain may be operationally profit-negative, it is the base against which innovations and profit engines are built
 - And, since Amazon manages its business around cash flow rather than profit margins, it matters little to the overall operating paradigm
- > Amazon's supply chain is the cash flow engine that is the critical flywheel behind their growth
 - While overall company revenue had a 23% CAGR between 2011-2016, operating cash flow had a 33% CAGR. As long as this dynamic holds, they will continue to be able to invest and innovate

Amazon Value Chain Analysis

Key indicators, 2011-2016



Revenue and operational growth rates, 2011-2016, all indexed to 100 in 2011

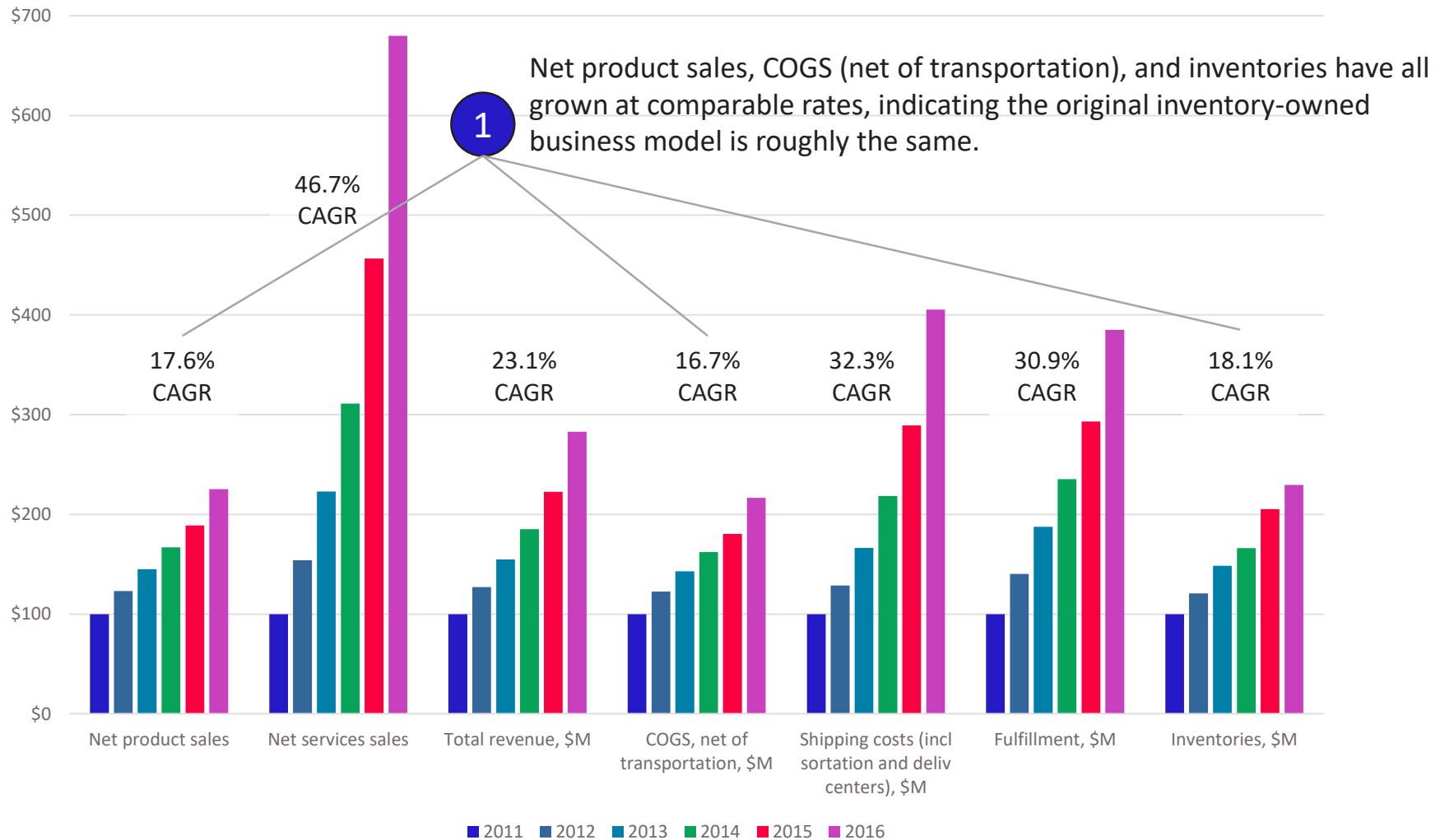


Amazon Value Chain Analysis

Key indicators, some insights



Revenue and operational growth rates, 2011-2016, all indexed to 100 in 2011

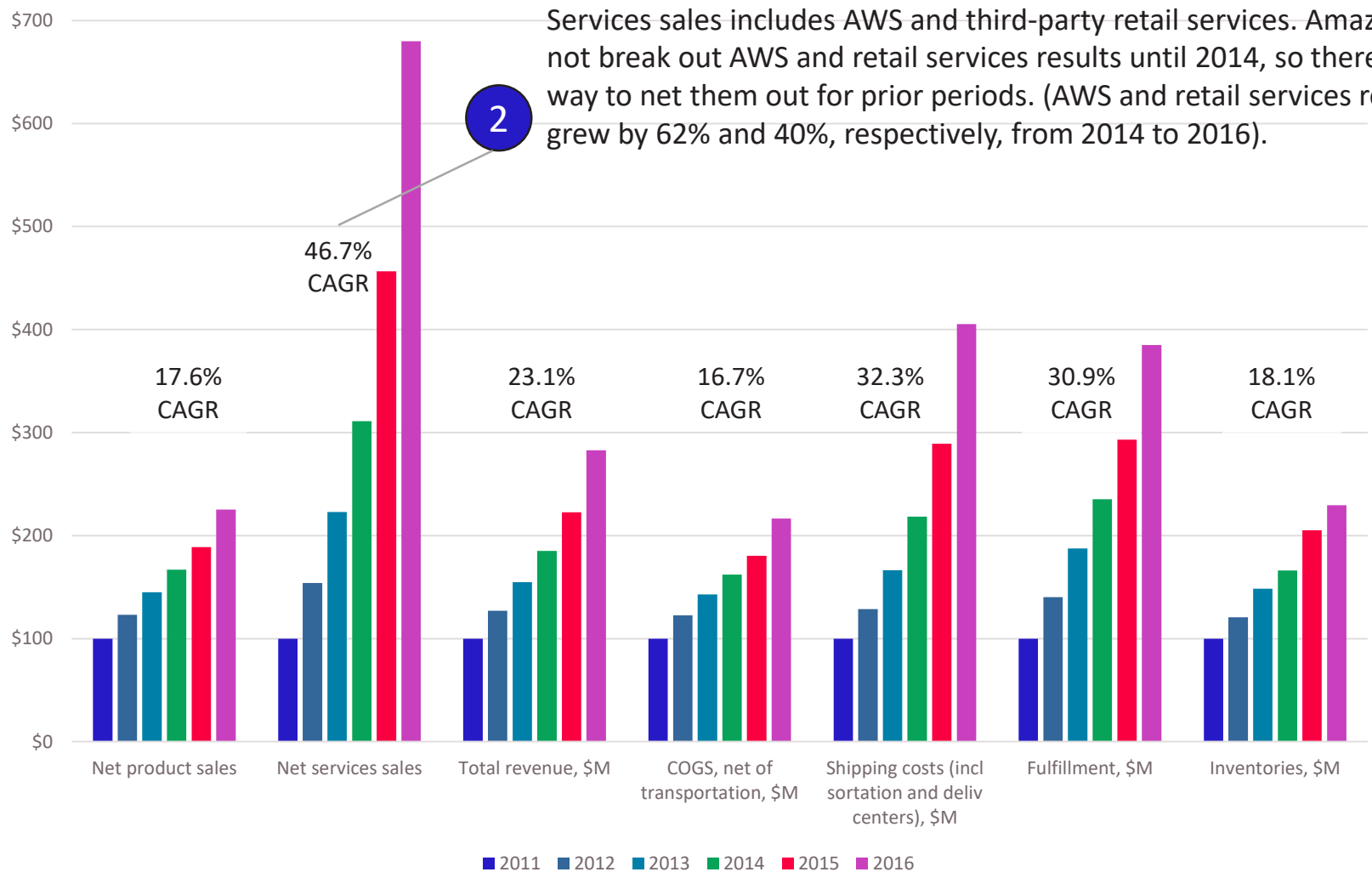


Amazon Value Chain Analysis

Key indicators, some insights



Revenue and operational growth rates, 2011-2016, all indexed to 100 in 2011

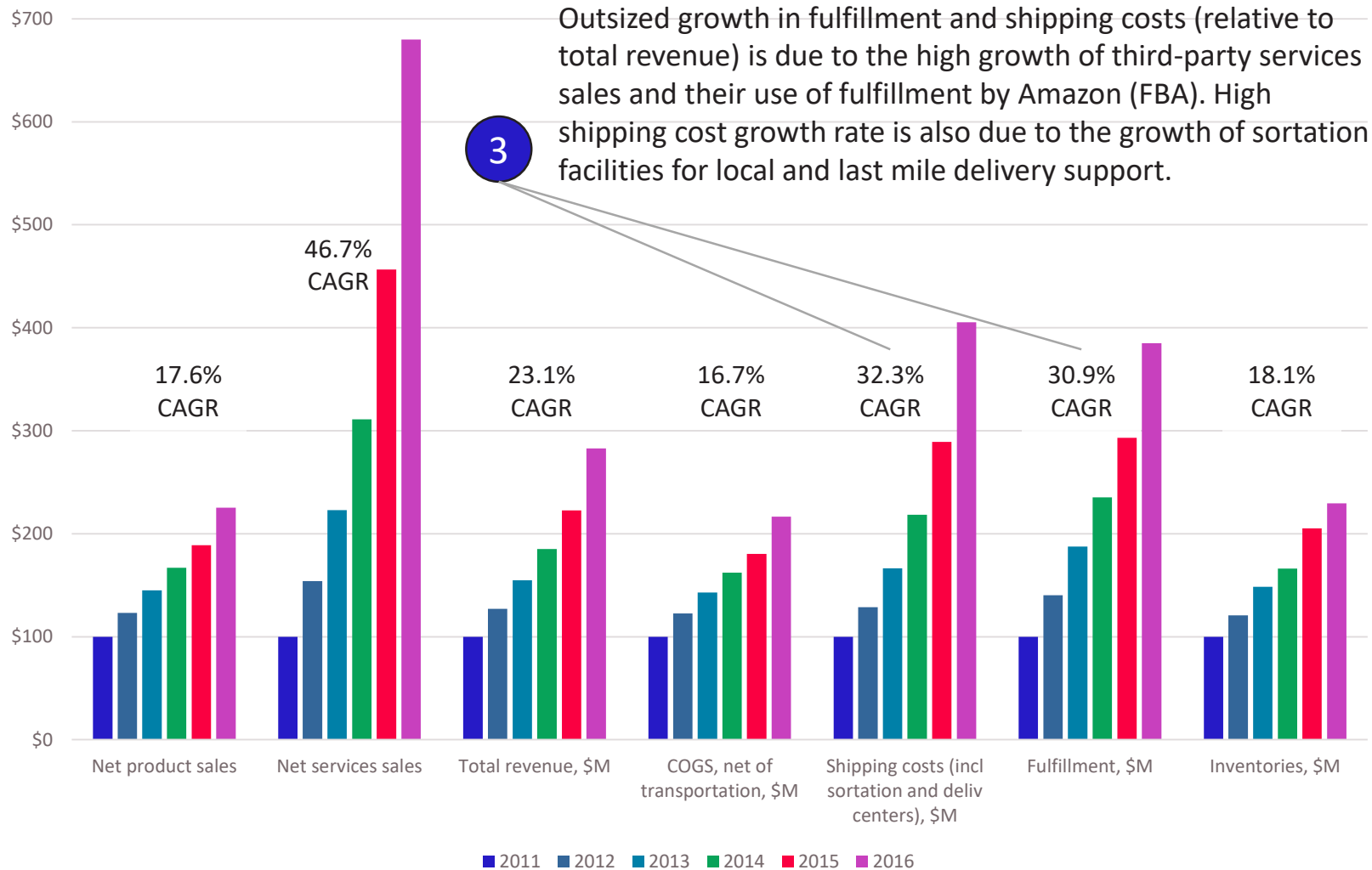


Amazon Value Chain Analysis

Key indicators, some insights



Revenue and operational growth rates, 2011-2016, all indexed to 100 in 2011



Amazon Value Chain Analysis

Key indicators definitions



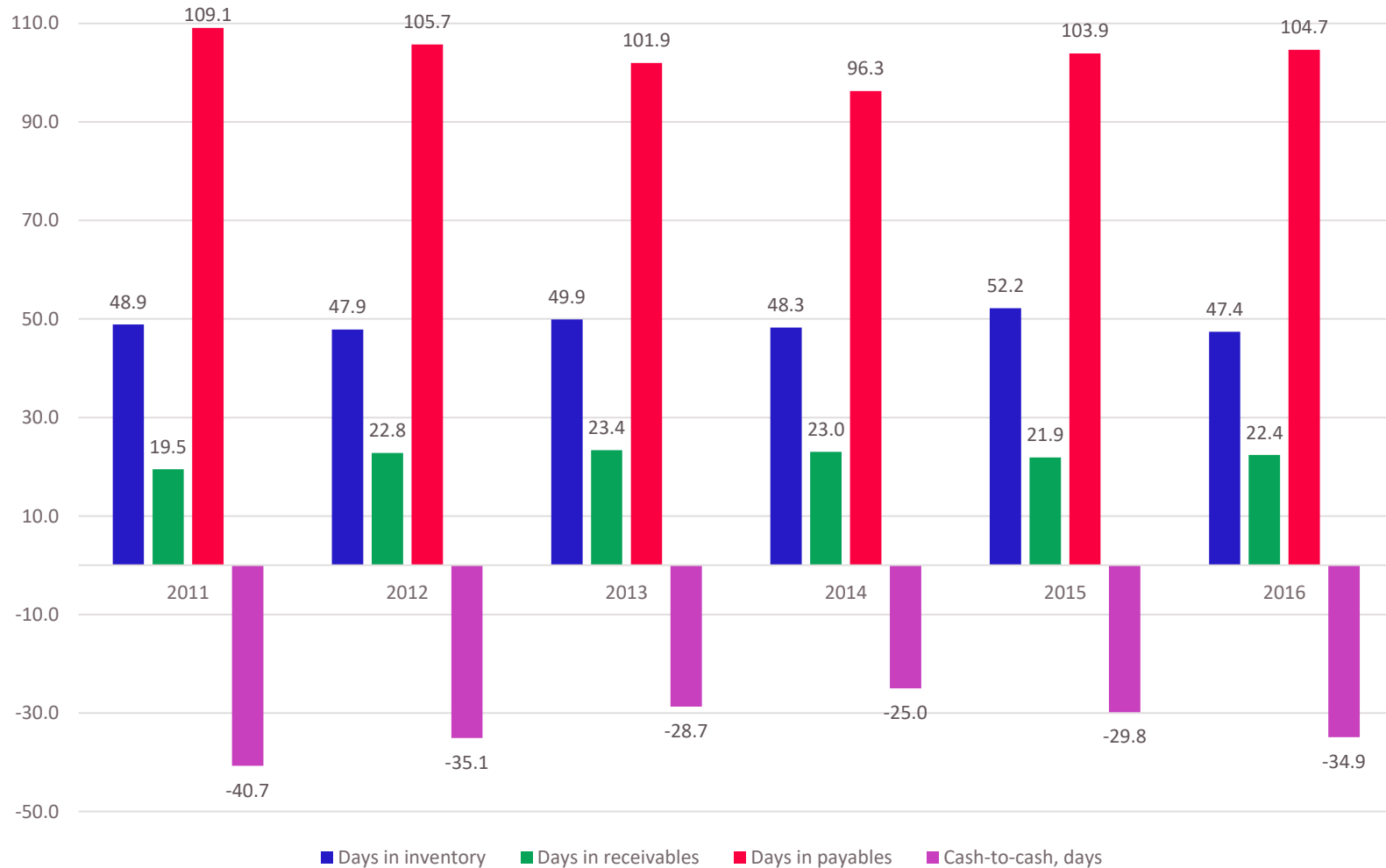
- Net product sales – sales of products where Amazon purchases the inventory, owns it, and fulfills it. Amazon records revenue based on the sale price of the product. Products include both physical and digital formats, both transactional and through subscription. This includes apportionment of Amazon Prime.
- Net services sales – sales of products where the supplier owns the inventory and fulfillment is either done by the supplier or fulfilled by Amazon (FBA). Services sales are based on fees associated with the product sold, not the gross price to the end customer. Net services sales also includes AWS, subscription services, advertising, and co-branding. This includes an apportionment of Amazon Prime.
- COGS (net of transportation costs) – Includes the purchase price of Amazon owned inventory and digital media content. Amazon includes transportation costs in cost of sales; they are segmented separately for this analysis.
- Shipping costs (also called transportation costs) – All outbound shipping costs for Amazon-owned inventory and third-party sellers that make use of fulfillment by Amazon (FBA). Roughly 50% of these costs are paid for by customers, or through an allocation from Amazon prime. These paid-for shipping costs show up as revenue.
- Fulfillment costs – costs to staff and operate Amazon fulfillment and customer service centers, including payment processing for Amazon-owned inventory and third-party seller services.
- Marketing costs – primarily online and other advertising and promotional costs.
- Technology and content costs – R&D and operational costs associated with software and technology infrastructure. AWS operational costs are also included here.
- General and administrative costs – corporate function costs, including HR, facilities management, finance, and legal.

Amazon Value Chain Analysis

Cash Conversion Cycle, 2011-2016



Remarkable consistency in the cash conversion cycle, year-in and year-out. This is the engine that keeps the flywheel going and is a critical part of how Amazon operationally manages its business.

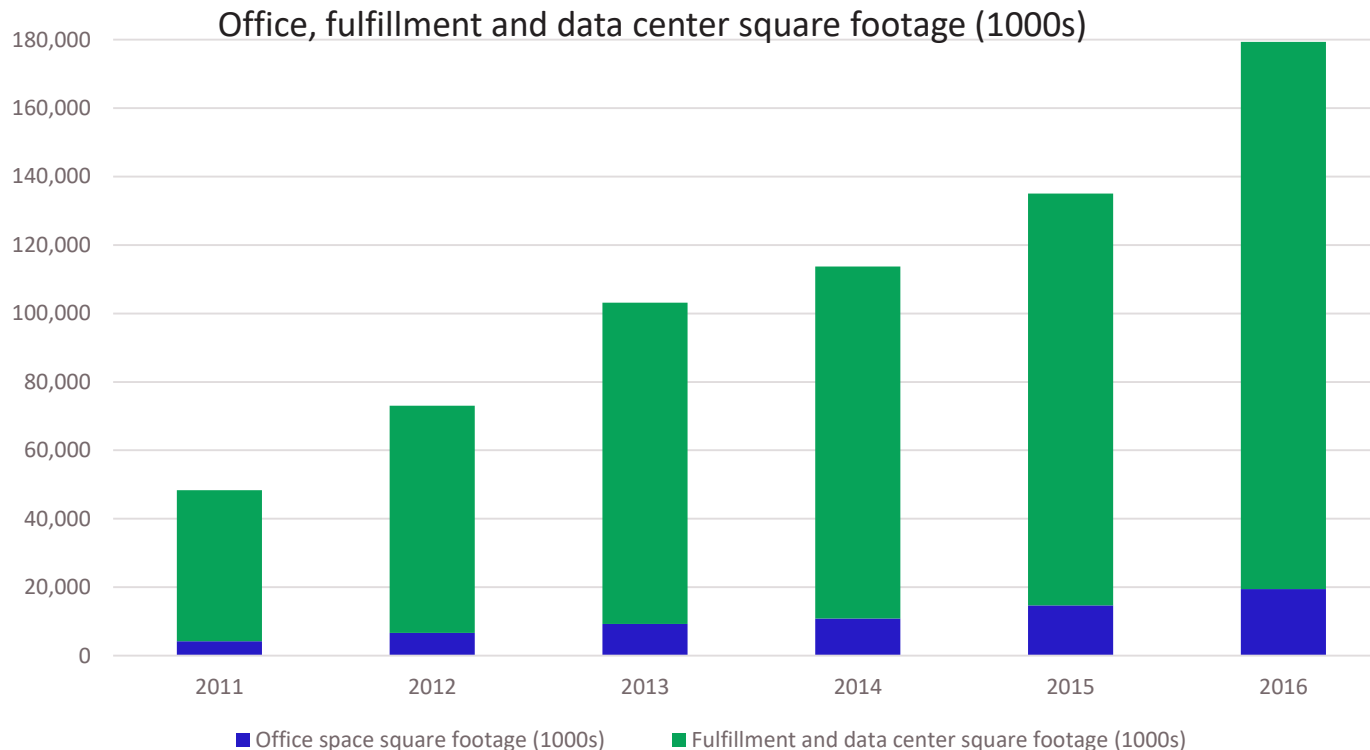


Amazon Value Chain

Fulfillment space growth



- At the end of 2016, Amazon had 160M square feet of space for fulfillment and data centers (Amazon does not break out its data center space separately; it is also assumed this number includes sortation space).
- Amazon leases 96% of its overall floor space, using a combination of operating and capital leases.
- Fulfillment and data center square footage had a 29.4% CAGR between 2011-2016. This is another triangulation point for deducing product gross revenue flow through its supply chain.
- Analysis suggests that Amazon drives about \$1,300/year in gross product revenue per square foot of fulfillment space.
- In a sign of accelerating third-party FBA sales, Amazon added, in 2016, nearly as much fulfillment space as their total space at the end of 2011, when they were a \$48B company.





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