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2022 GLOBAL E-COMMERCE LOGISTICS OUTLOOK

E-commerce activity slowing down; how will this impact air logistics?

2022 Global E-Commerce Logistics Outlook

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Executive Summary

E-commerce is fundamentally changing the physical distribution of goods. This matters to companies in the global logistics business because it is creating both new opportunities for growth as well as risks to profitability. Most of the disruption is taking place in the business to consumer segment, where both supply and demand patterns have changed significantly. As such this report focuses on the business to consumer, rather than the business to business and consumer to consumer segments.

E-commerce is not a choice; it is here to stay and has fundamentally changed the distribution of goods. This matters to companies in the global logistics business because it is creating both new opportunities for growth as well as risks to profitability. Most of the disruption is taking place in the business to consumer segment, where both supply and demand patterns have changed significantly. As traditional high e-commerce penetration markets such as the US, Europe and possibly even China are reach a saturation point, the focus will shift to markets in other parts of Asia, Middle East, Africa and Latin America. Domestic and intra-regional e-commerce performed better than cross-border due to the continuous lack of intercontinental cargo capacity in 2021 and 2022.

Consumption of digital services remains strong more than two year after the pandemic started, a trend that will likely continue over the next years but at a slower pace. We have seen the first signs of e-commerce activity slowing down since the beginning of 2022. The largest online platforms have reported slowdowns in their e-commerce business and while overall sales remain strong, the impact of inflation in consumer spending and the return of in-store shopping are impacting this segment.

E-Commerce logistics fulfillment networks and service requirements are being shaped by the large global and regional platforms. The 12 companies included in our analysis account for almost 50% of the value of global e-commerce revenues. Most of that is generated by three platforms – Alibaba, JD.com and Amazon. These companies are large and increasingly powerful buyers of logistics services. Understanding these companies is key to understanding some of the larger contracting opportunities available to logistics companies.

Amazon is now the fourth largest aircraft customer worldwide, behind FedEx, DHL, UPS and before SF Express. Amazon remains the only company with a substantial and growing dedicated air network, but other platforms make use of air capacity through partnerships. However, Amazon has started slowing down its operations and its flight activity over the last six months has practically stalled.

All platforms have one thing in common: controlling logistics is central to their strategy. However, the meaning of control varies across platforms with some such as Amazon choosing to be very hands on and others working through third party subcontractors and partners.

1. Introduction and Organization of the Report

Since 2019 we have been publishing an e-commerce logistics outlook that focuses on the impact of e-commerce growth on companies operating across the air logistics business, including postal and express companies, airports, airlines, service providers and leasing companies. This year, the outlook for global e-commerce seems to have taken a downturn and the market over the next months will be normalizing.

Chapter 2 provides an overview of the main e-commerce markets worldwide, as well as recent developments across key markets in North America, Europe, and China.

Chapter 3 provides an overview of the mechanics of domestic and cross border e-commerce. This is an important starting point in understanding where to look for future air logistics opportunities.

Chapter 4 focused on the role of the big e-commerce platforms in shaping air and ground logistics requirements. Compared to previous reports, we have expanded our coverage to include more platforms. The Appendix to this report contains detailed logistics profiles of each of the platforms covered.

Chapters 5, 6, and 7 go into further depth examining how business to consumer traffic has shaped strategy and the outlook in the Postal, Express and Air Cargo business. We regularly publish analysis on these topics available on our Insights (www.cfcinsights.com) platform, and as the business evolves so does our thinking.

Chapter 8 analysis the differences and reasons in market performance across to large geographical markets – South East Asia and Latin America. Both hold great promise for future growth, and they are the fastest growing regions in terms o e-commerce sales.

The report is complemented with an interactive PowerBI Dashboard that allows users to analyze and understand different aspects of the e-commerce logistics business.

We trust that you will find the material presented in the report valuable in shaping your company's ecommerce logistics strategy or e-commerce product offering. As always, we welcome your critical comments and feedback on the content, as well as subjects that you would like included in future analyses.

2. E-Commerce Markets and Growth Drivers

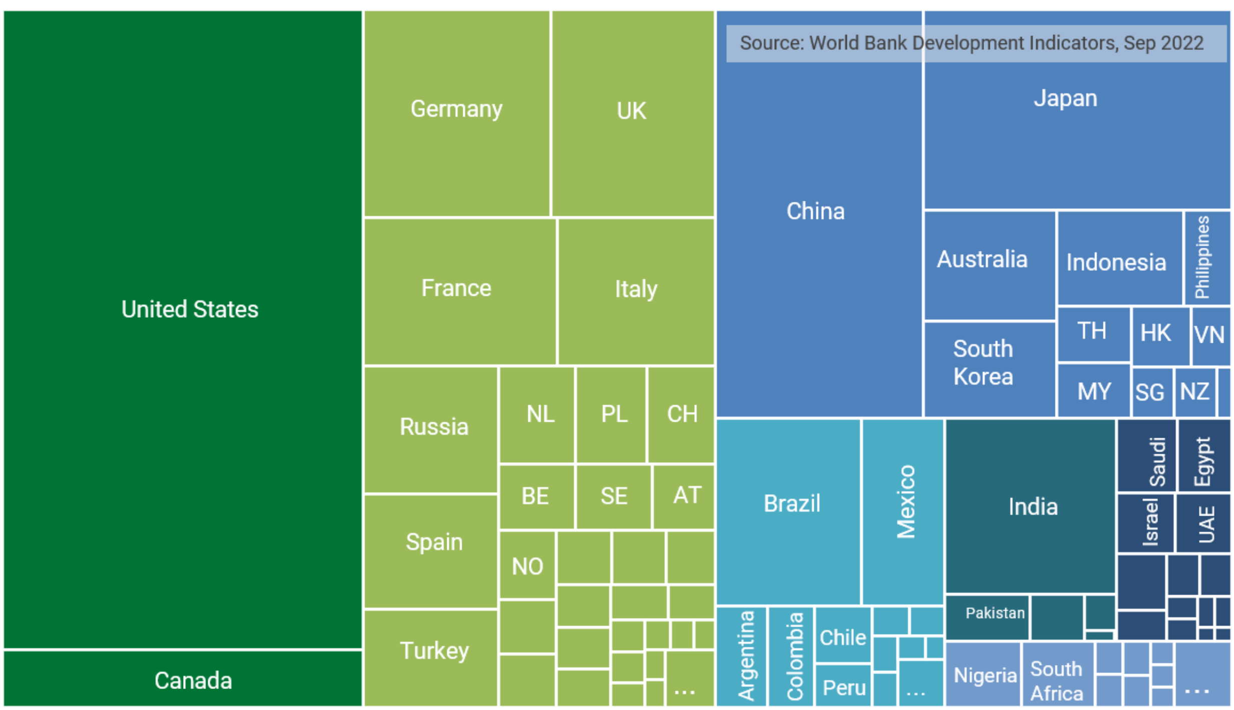
Key findings:

- Global e-commerce sales reached $4.9 trillion in 2021 and this number is expected to surpass $5.5 in 2022, accounting for about 20% of total retail sales worldwide.
- E-commerce sales are expected to continue growing over the next years, but at a slower rate as traditional brick and mortar shops make their return after a two-year hiatus.
- Domestic and intraregional e-commerce continues to perform better than cross border e-commerce.
- China accounts for the highest share of global e-commerce size and sales.

2.1 In Context: Global Retail and E-Commerce

The United States, the European Union and the United Kingdom, China, and Japan account for two thirds of worldwide consumer spending. The US and the EU alone each account for over a quarter of total household consumption. Figure 1 displays an overview of the retail markets worldwide.

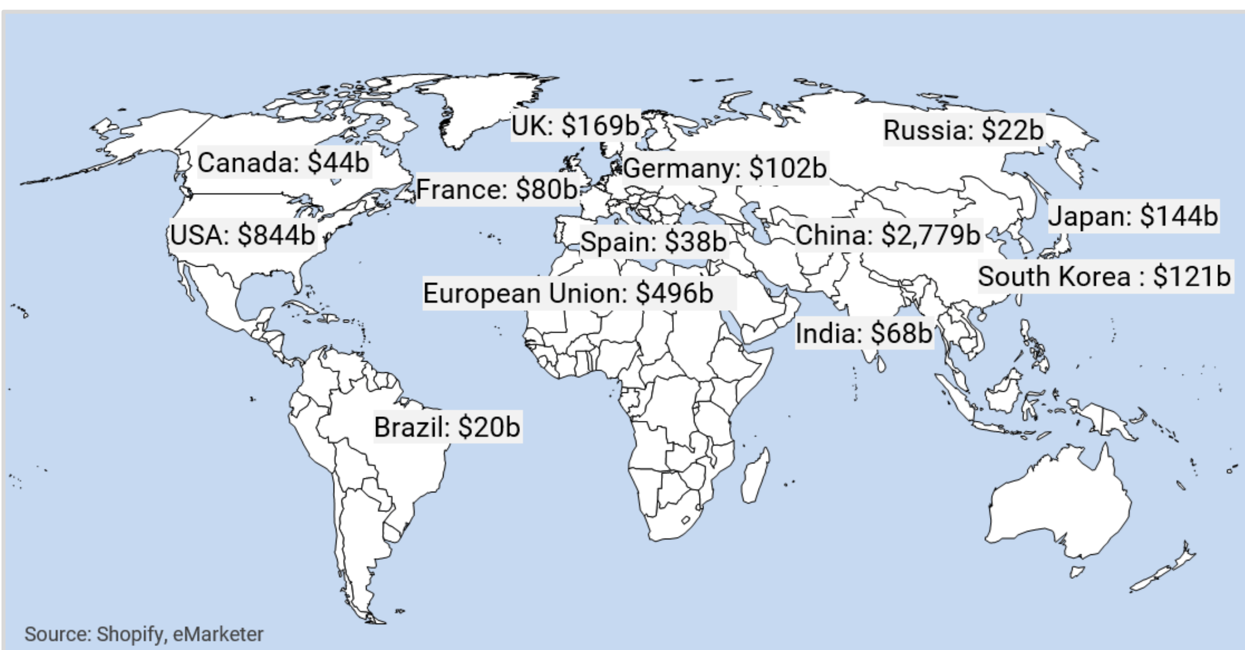
Figure 1 - The World's Largest Retail Markets in 2022



These markets are also the biggest business to consumer e-commerce markets, although China's e-commerce market is proportionally larger relative to its overall level of consumer spending and by some counts, Chinese consumers spend more on online shopping than any other country in the world. Most retailers earn most of their revenue from local operations, giving the impression that those with the largest domestic markets have the greatest foreign operations, but this is not necessarily the case across the world.

Figure 2 shows the largest e-commerce markets in terms of revenue. In 2021, e-commerce sales grew by 16% but this rate has slowed down, and we estimate a 12% annual growth in 2022. Cargo Facts Consulting estimates that the European Union accounts for approximately $500 billion in e-commerce revenue and is the third largest e-commerce market after China and the United States. The world's largest markets shown in the grew 12% in average with India displaying the largest growth of about 26% in 2021 while Japan only grew by 2%. Ecommerce sales in the US and China added up to more than $3.6 trillion, or about 73% of the total world e-commerce sales. It is important to note that the UK registered a drop in e-commerce sales of 6.3% last year.

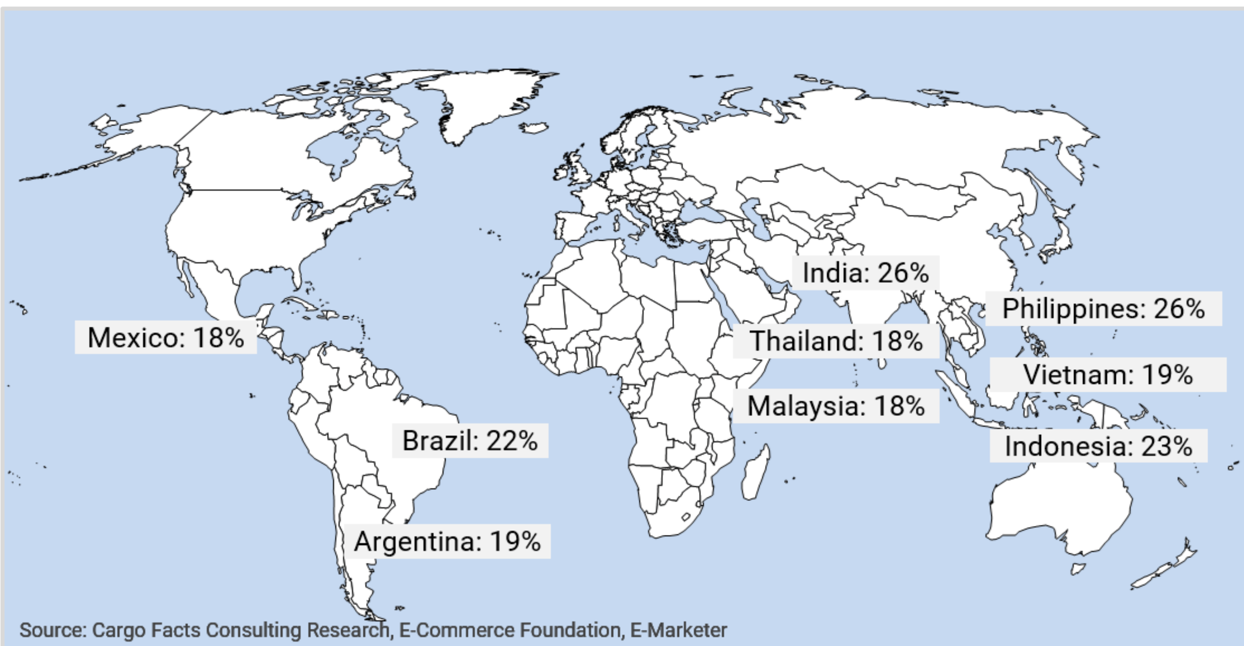
Figure 2 - E-Commerce Revenue by Market (2021)



Our analysis finds that Indonesia, India, Brazil, the Philippines and Argentine have seen the highest rise in e-commerce revenue while some other more mature markets such as Japan, France and Spain have been – relatively speaking – growing at a slower pace or below the 12% average.

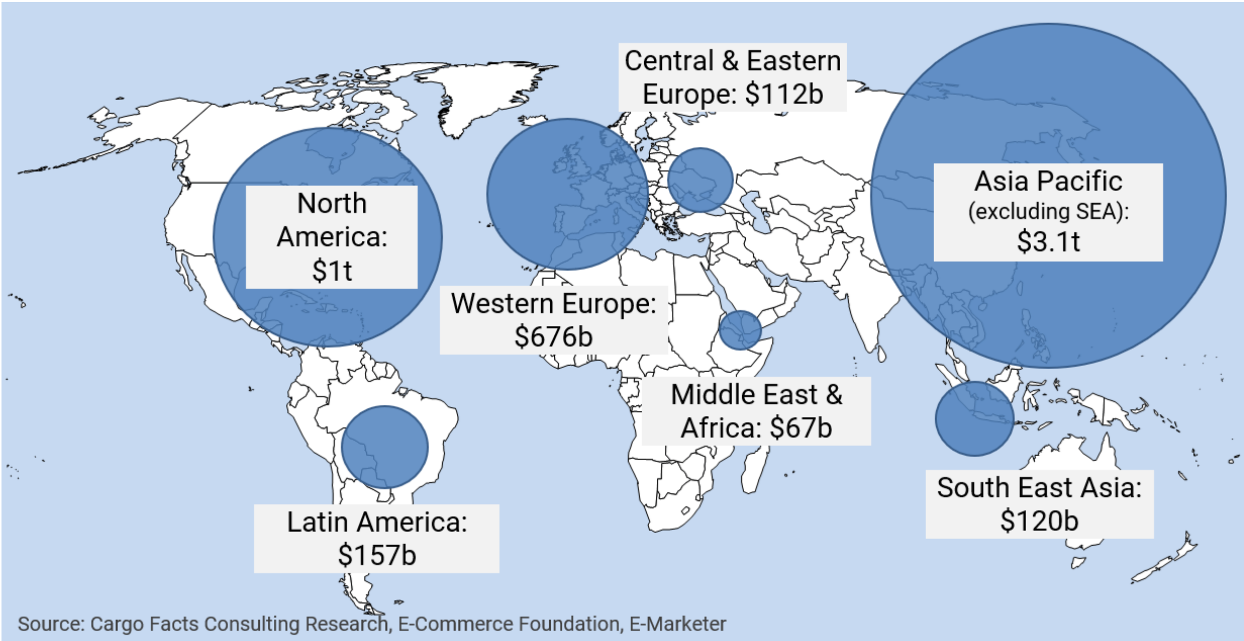
E-commerce market penetration, the share of retail that is conducted online varies across countries and regions, with China, the United States and the European Union displaying the highest shares, between 15% and 20%. Shares in Latin America, Asia Pacific and Africa are much lower than these countries, often lower than 10%. The pandemic accelerated the e-commerce share of all retail sales globally as digital channels became the most popular alternative to in-person shopping. However, countries in South East Asia and Latin America registered the highest growth in terms of e-commerce sales and they overtook the mature and more established markets such as Canada, Japan, or Germany. Figure 3 shows the top countries ranked by e-commerce revenue growth so far in 2022.

Figure 3 – Largest E-commerce Revenue Growth Markets 2022



These fast-growing emerging markets will continue to display the highest growth over the next years but off a much smaller base. Figure 4 shows the estimated regional e-commerce sales recorded in the last twelve months.

Figure 4 – E-commerce Revenue by Region 2022

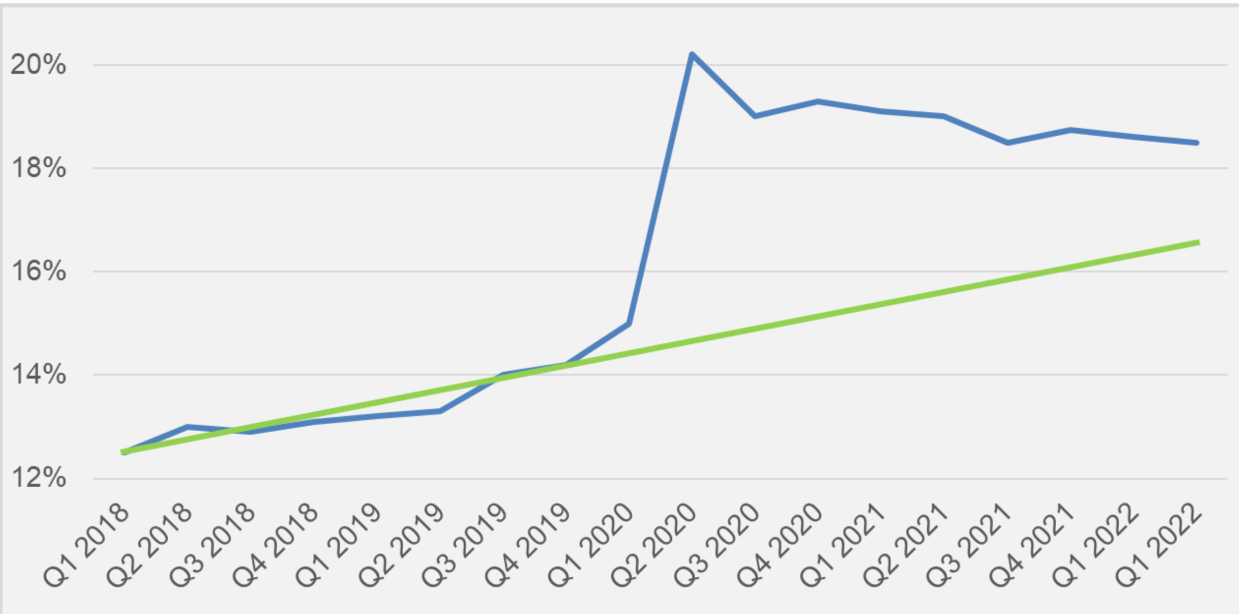


Before the pandemic, we had observed a slowdown trend in consumer spending, but the pandemic led to a rapid acceleration globally, including those countries that had a slower growth rate. South East Asia and Latin America showed the highest growth of e-commerce revenue, at a 35% rate while Asia Pacific displayed a 18% growth in 2021. All these growth rates are expected to slow down in 2022 and mature regions such as Western Europe will display growth rates in the 6-7% range this year, according to our estimates.

2.2 US E-Commerce in 2022

US e-commerce sales grew by 21% in 2020, while in store retail declined by 1%, with department stores, electronics stores, clothing stores and restaurants showing very large declines as large part of the population was forced into lockdowns. The high level of e-commerce growth achieved in 2020 continued into 2021 but 2020 has seen a slowdown. E-commerce sales activity continues to move sideways at about 18% of total retail sales, down from the peak in 2020 but above pre-COVID levels. Nevertheless, data is showing about 1.6 percentage points above where the pre-COVID trendline placed us between 2018 and 2019. The data shown below excludes motor vehicles and part dealers.

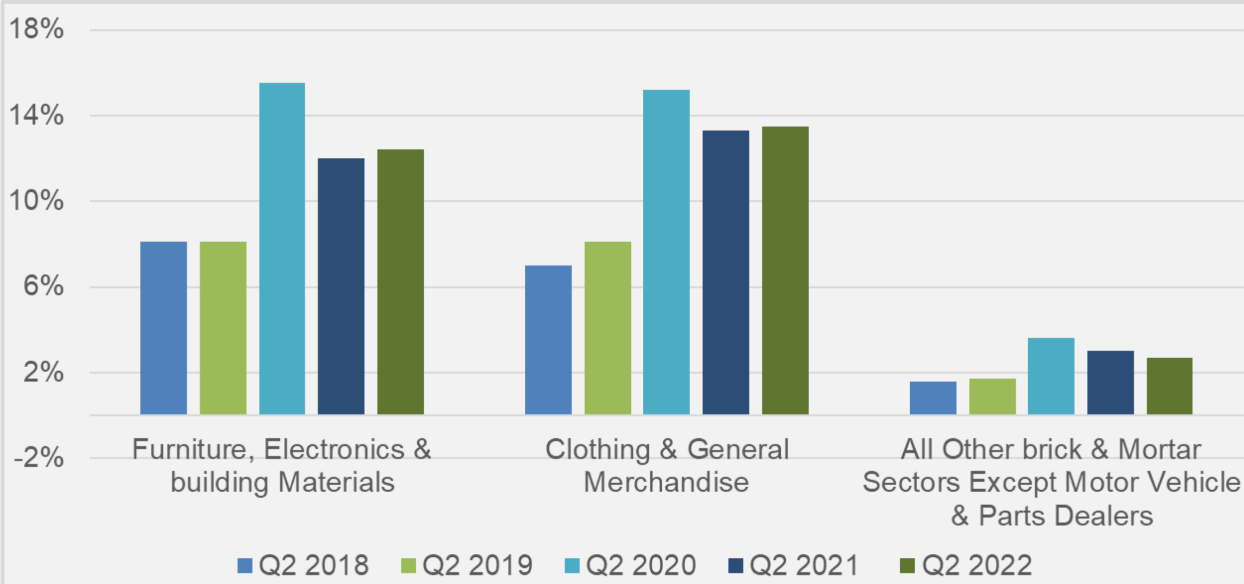
Figure 5 – Seasonally adjusted E-commerce Sales as a % of Total Sales



Source: Cargo Facts Consulting Analysis of US Census Bureau

Figure 6 shows e-commerce sales as a percentage of total sales for different brick & mortar sector combinations for the 2nd quarter of each year going back to 2018. We see a similar story: the e-commerce percentage is flat year-over-year.

Figure 6 – US E-commerce as a % of Total Sales for Brick-and-Mortar Retail Sectors



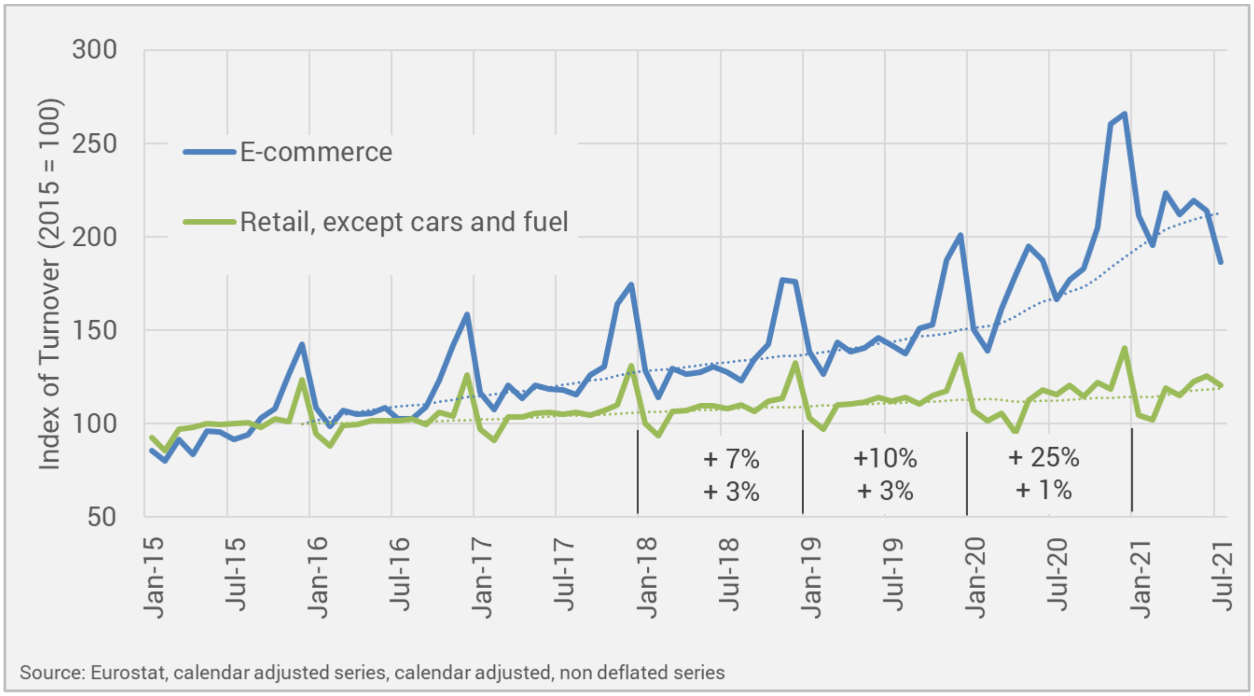
If anything, e-commerce would have been a slightly higher percent than in Q1 except for the fact that higher gasoline prices resulted in gasoline having a disproportionate impact on total retail sales. This observation suggests an interesting point: while the declining severity of COVID is pushing consumers to shop in-person, high gas prices may be pushing more online purchases. Given high gasoline prices strongly affect retailers' cost structures for online delivery, this is something that is worth exploring.

This data coupled with the horizontal movement in inflation adjusted retail ex auto sales, point towards this holiday season likely having fewer parcels than last year (and certainly we shouldn't expect growth). This runs counter to the trend we saw from 2010 – 2020 where e-commerce saw an increase in the percentage of retail ex auto sales. Something certainly worth thinking about as a transportation provider exposed to this space.

2.3 European E-Commerce in 2022

The development in Europe is similar, but 2020 growth was even higher than in the US. Overall online sales in the last twelve months grew by 14%, while the remaining retail sector (which includes online retail) grew by 1% (see Figure 7). As with the US, we expect growth in the second half of 2022 and beyond to moderate.

Figure 7 - EU 27 Retail and Online Retail Sales Index Jan 2015 - Jul 2022



2.4 China's E-Commerce Market Potential & Environment

China stands out as the largest e-commerce market and projections show that they will remain in the first position in the foreseeable future, but this country still faces multiple challenges in the e-commerce space. Advertising products through online tools like Instagram or YouTube is not possible in China and online consumers prefer social media or mobile applications over standalone websites to purchase products. It is easier for Chinese businesses to enter Western markets, but the opposite requires an ICP (Internet Content Provider) license from the Chinese Government, a troublesome and lengthy process required for all foreign domains. Many international corporations struggle to make money in China's e-commerce market. Marks & Spencer, ASOS or Revlon are just a few of the well-known companies that have failed in China over the past years. Amazon's foray into China was entirely unsuccessful – while the company achieved a market share of around 15% in 2011, this dropped to less than 1% four years later, leaving little choice but to exit the market completely.

Our analysis shows that the Chinese e-commerce environment is dominated by a few players and most customers in China purchase goods directly from these platforms. There are three main sales channels in the Chinese e-commerce industry, and each has a defined target group and customer strategy (see Figure 8).

Figure 8 - Chinese E-Commerce Sales Channel Strategy Framework

Social Commerce Platforms

- Pinduoduo, WeChat
- Use of Social Media platforms
- Broad customer base due to large use of cell-phones

Online Marketplaces

- JD.com, Alibaba
- High sales potential of large global customer base
- Leverage of established e-commerce infrastructure

Third-Party ECommerce Retailers

- DHGate.com, Suning, Mecoxlane
- Product focus leading to high relevant target groups

The domestic rivalry in Chinese market is also strong and only those companies that have proved to be creative, competitive, and unique have survived. Moreover, Chinese customers are hesitant to purchase items from firms they have never heard of. So, while selling your items on well-known e-commerce platforms like Tmall or JD.com is required, small businesses will almost certainly be unable to do so due to the rigorous restrictions and limitations imposed by each site. This leaves us with Alibaba, JD.com and Pinduoduo dominating the Chinese e-market. While these three platforms are subject to the same regulatory framework, Alibaba has been under increased scrutiny for its business operations, which has benefited its competitors, notably JD. JD's overall sales are higher than Alibaba's, even though Alibaba has three times the transaction volume due to different business strategies. International e-commerce was just 7% of Alibaba's revenue in the most recent quarter.

Pinduoduo is the newest addition to China's e-commerce big three, which have only recently emerged. Until 2019, Alibaba had dominated the roost, with JD attempting to catch up. Last year, though, the 5-year-old Pinduoduo became large enough to pose a concern. Pinduoduo made effective use of the WeChat messaging platform to advertise cheap items in smaller towns and rural areas. Its user base has exploded in recent years, increasing by 24% in the year to June to almost 850 million, surpassing Alibaba's. Pinduoduo has also been focusing its efforts on growing its client base through large sales events, with profitability being a distant second but it has the potential to become an even more powerful force when it begins to focus on recouping this investment.

Pinduoduo is doing exceptionally well chasing down its domestic rivals. Despite months of lockdowns in Shanghai, revenue rose 36% year-on-year to 31.4 billion yuan, about $4.6 billion, in the three months to end June. Pinduoduo has also confirmed its international expansion and has tried to push into Western markets and Southeast Asia through AliExpress and Lazada.

2.5 Cross Border E-Commerce in 2021 and 2022

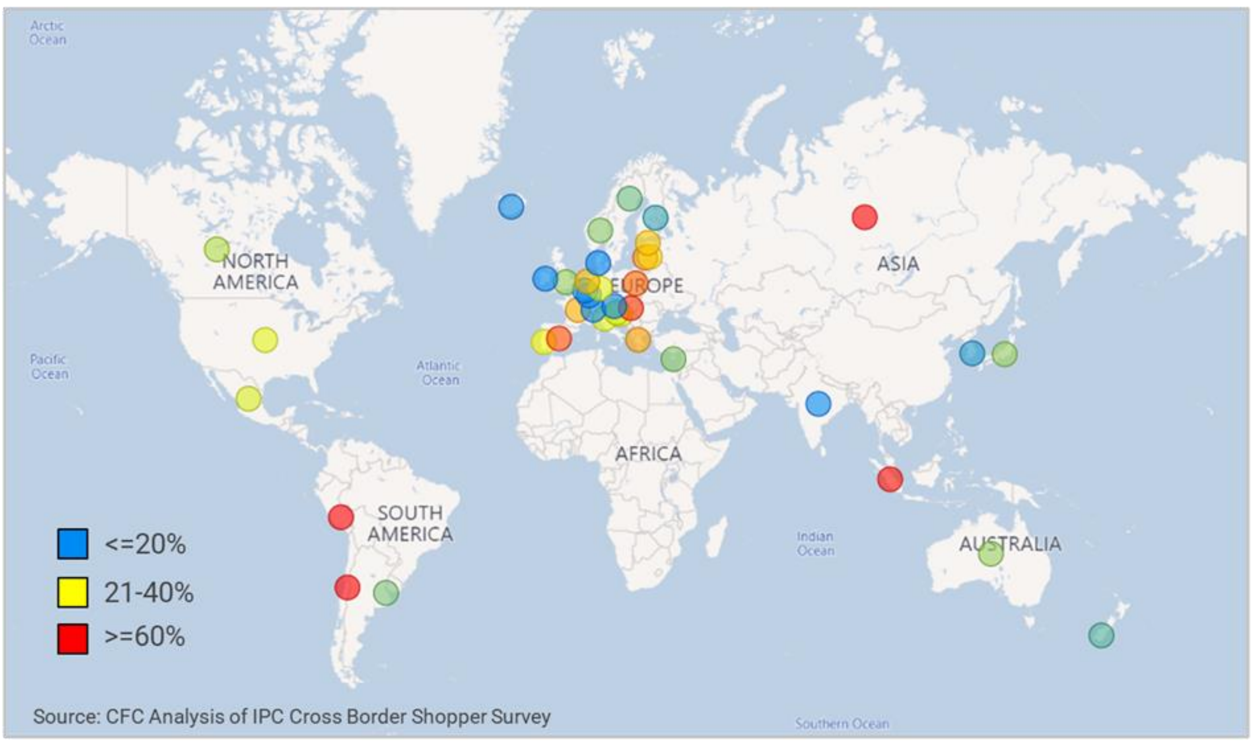
E-commerce platforms are continuing to develop globally, and they are using a variety of methods to their cross-border e-commerce strategy. Cargo Facts Consulting has compiled a list of the various techniques, as well as their benefits and drawbacks, that different platforms have utilized when beginning cross-border operations. A successful strategy requires the correct implementation of one or more of the approaches listed in Table 1. The Chinese giants, Alibaba and JD.com have both introduced branded sites in their international marketplaces with the aim to provide an enhanced customer experience.

Table 1 - Strategies for Cross-Border E-commerce adopted by Platforms

Strategy	Pros	Cons
Partnering with local vendors	Logistics operations managed by experienced local teams	Vendor sourcing process and limited control of brand experience and operating costs
Establish a local entity within the foreign country	Possibility of future expansion, control of full operations, consumer experience and IP	Large upfront investment, long ROI and comprehensive research on import, market, taxes, policies and regulations
Introduce a online marketplace	High traffic and outsourced logistics; continuous monitoring of consumer behaviour	Higher costs to run branded sites and slower servers; higher competition on potential saturated marketplaces

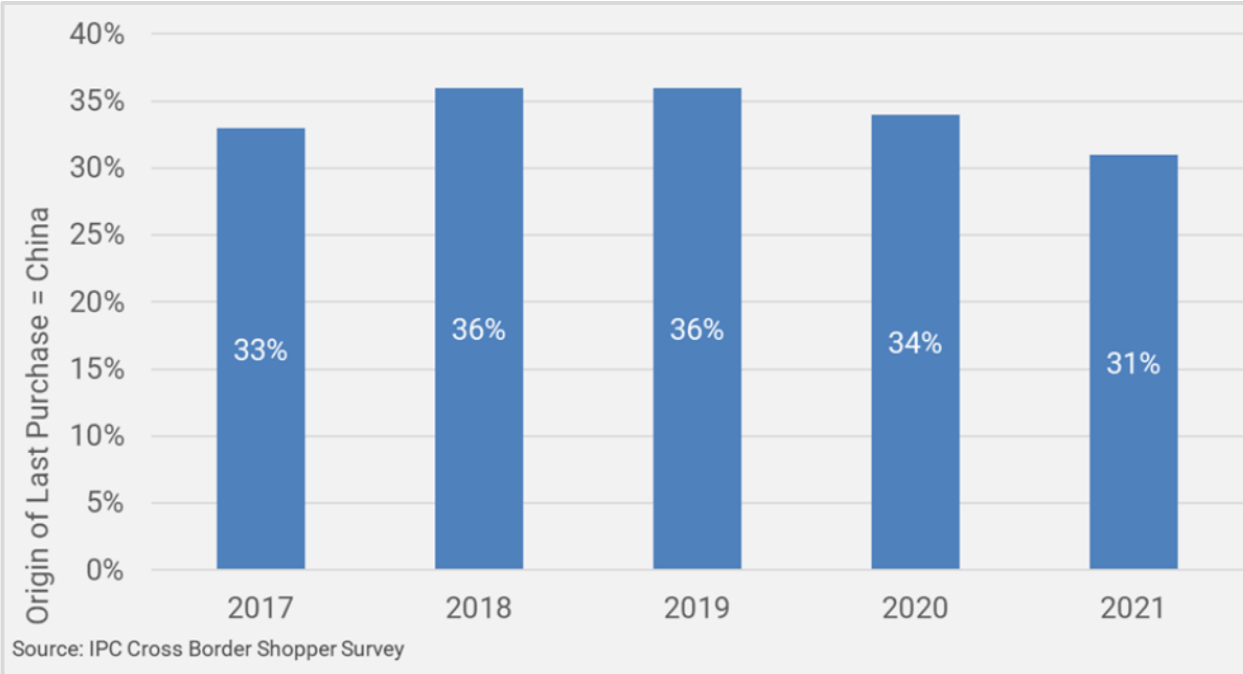
China is the primary source of cross-border purchases, accounting for about 31% of cross-border purchases worldwide. However, there are some big differences between countries. Some, like Russia, draw more than 80% of cross-border volumes from China, while in other markets such as India that number is closer to 11%. The figure below shows an overview of the importance of China as a source of cross-border e-commerce. Generally, countries will draw significant cross-border volumes from neighboring countries. For example, the main source of cross-border purchases in Canada and Mexico is the United Stated. If intra-EU transactions (which are essentially domestic) are excluded, this number would be much higher. Figure 9 displays an overview of key e-commerce markets and the share of Chinese cross-border purchases.

Figure 9 - Chinese Share of Cross Border E-commerce by Country 2021



The importance of China has decreased throughout the COVID-19 pandemic, from a peak of about 36% of all purchases in 2018 and 2019, down to 31% in 2021 (see Figure 10). Much of this has been a consequence of long-haul capacity constraints, but changes to tax-free thresholds in Europe have also reduced the demand for China-sourced goods vis-a-vis domestic or intra-European sellers.

Figure 10 – China's Share of Cross-Border Purchases, 2017 – 2021.



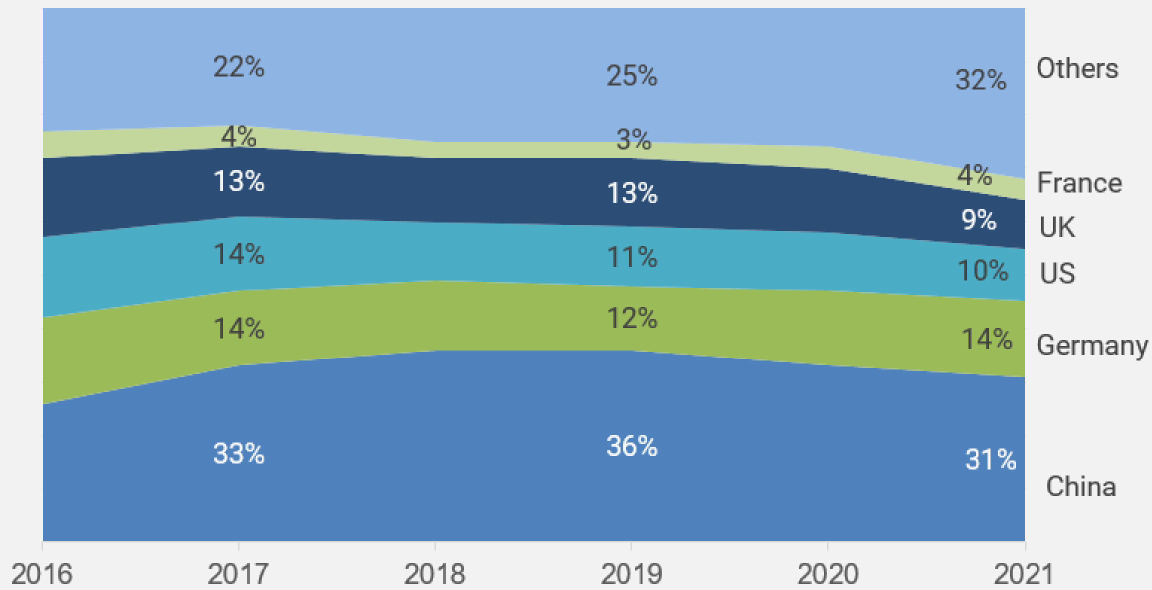
The most important platforms for cross-border purchases are Amazon, Alibaba/AliExpress, eBay, Wish, Zalando and Shein. In the case of Amazon and Zalando, much of the cross-border trade is intraregional trade, while Alibaba, Wish and Shein are China-origin-focused platform.

In 2021, there were two global events that impacted cross-border e-commerce activity. The first one being the United Kingdom's exiting the European Union where over 15% of consumers noticed an impact on their purchases according to the latest data published by the International Post Corporation (IPC). This translated into additional custom charges on cross-border e-commerce purchases. The other event had to do with the European Union's increase of tax rates and custom fees for low-value items originating outside the EU. Chinese e-commerce platforms have been the most affected by this change, with consumers paying additional custom charges and items becoming more expensive. Almost 40% of EU e-commerce consumers were impacted by this change since January 2021.

When looking back at the cross-border purchase origin in 2016, China, the US and the UK have seen the largest decreases while Germany and France have maintained their share. The remaining share coming from 'Other countries' has significantly risen from 22% in 2016 up to 32% in 2021. This reflects that consumers are buying from a different neighboring country other than the five big listed below (Figure

11) and it shows how cross-border e-commerce activity has geographically diversified over the past few years.

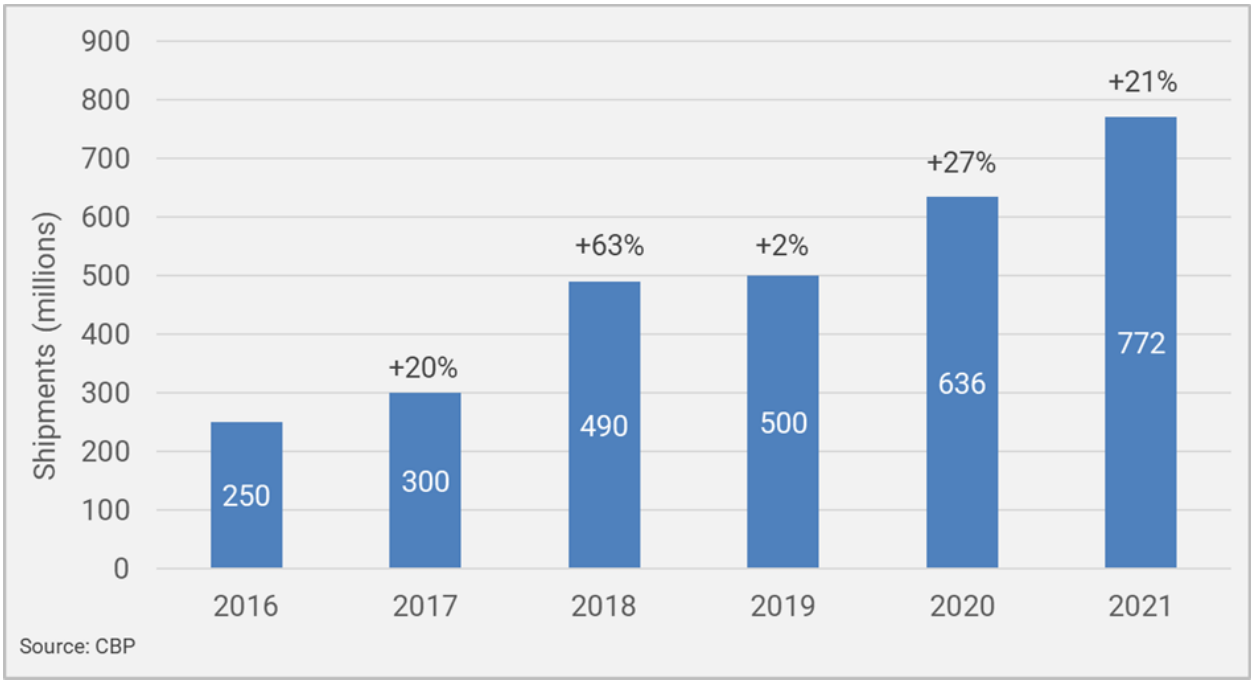
Figure 11 – Most Recent Cross-Border Purchase by Country, 2016-2021



Source: Cargo Facts Consulting Analysis of IPC Survey Data

In the case of the United States, we see that US inbound e-commerce shipment growth has stalled. In the case of the U.S., the China share has declined to 38% of all purchases in 2021 from 47% in 2020 and 57% in 2018. The share of purchases drawn from Canada has increased while the U.K. has remained constant. However, despite air cargo capacity constraints, Section 321 shipments valued at less than $800 grew by 21% in FY 2021 and 27% in FY 2020, with the fiscal year ending September 30 (see Figure 12).

Figure 12 – US Shipments at $800 or less processed in e-commerce, FY 2021

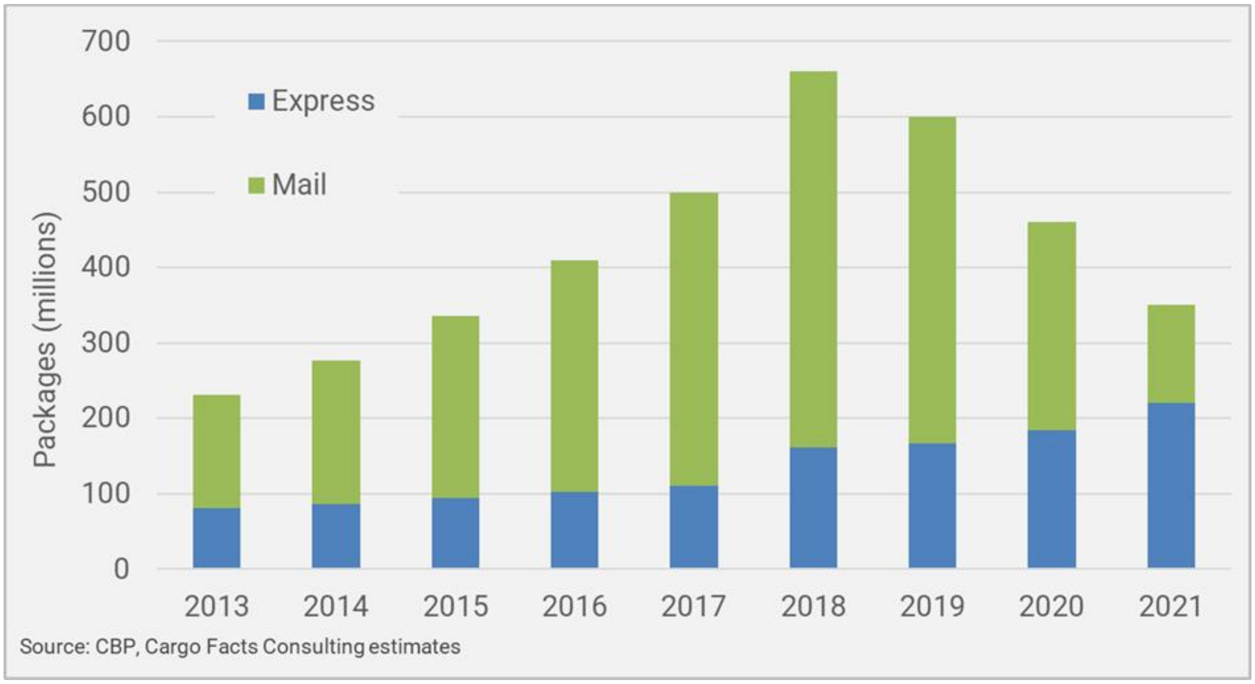


FY 2022 figures so far point to possible declines in 2022, with the October-to-January period only generating 204.2 million shipments of 613 million on an annualized basis. Since signed into law in early 2016, the Trade Facilitation and Trade Enforcement Act (TFTEA) provides a tax- and duty-free importation threshold of $800 per shipment (and person per day) — so-called Section 321 shipments. The previous threshold was $200. The vast majority of e-commerce purchases fall below this threshold; generally, more than 70% are worth less than $100.

Until 2018, most small package traffic moved either by mail or express, but the structure of the market began to change, with strong growth in shipments moved by general airfreight as well as by truck. Section 321 shipments by air increased 219% in FY 2020 and 23% in FY 2021. Air express, mail and airfreight account for more than 85% of total de-minimis traffic — or about 55,000 tonnes per month.

Figure 13 provides an overview of inbound express and mail packages between FY 2013 and FY 2021. This is based on data captured by U.S. Customs and Border Protection as well as our own estimates. Not all shipments moved by express or mail fall under the $800 threshold, although we estimate that most mail and about half of express shipments do.

Figure 13 - U.S. inbound express and mail small package traffic FY 2013 – FY 2021



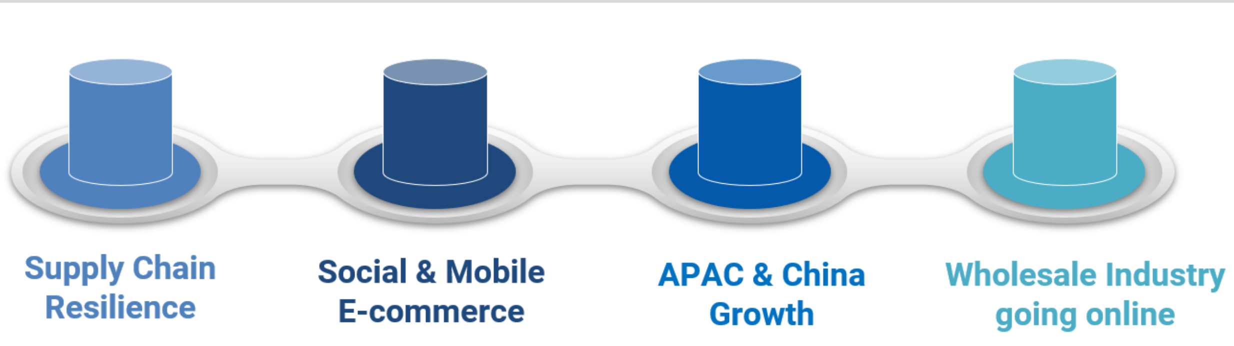
Combined express and mail traffic peaked in 2018 and has been declining since. However, the decline has primarily been a result of a drop in postal volumes. The postal business, which relies heavily on passenger belly capacity, has been strongly affected by the decline in intercontinental passenger services. The latest volume data published by USPS does not show this volume picking up. Even without pandemic-induced capacity constraints, using international post as a cross-border e-commerce solution has fallen out of favor.

Further growth can be expected with the continued expansion of express operator cross-border logistics services and expanding international e-commerce platform activity in North America, but it appears the largest growth will be in general airfreight networks where volumes are controlled by e-commerce consolidators and specialist providers that are not necessarily household logistics names.

2.6 Beyond 2022: E-commerce Trends to Watch …

The pandemic has accelerated the shift to online shopping with most major e-commerce platforms reporting strong sales in 2020 and 2021. The rate of digitization continues its upward trends and the e-commerce giants have benefited from a higher number of individual consumers shopping online. Platforms have leveraged their technology and logistics capabilities to ensure the steady supply and on-time delivery of products to consumers, but has this increase in e-commerce adoption stayed beyond 2020? Reports indicate that the pandemic has pushed the industry ahead by around five years but results in 2022 show a normalization of the market.

Figure 14 – Top Global E-commerce Trends, 2022



The impact of COVID-19 in supply chains was a major disruption and this drove companies to focus on supply chain resilience. But the effects of the pandemic are not an exception. Supply chain disruptions will keep happening and logistics networks will be exposed to natural disasters, economic changes, or political instability. We have observed more retailers, especially within the clothing sector, buying logistics companies and acquiring fulfilment centers and bringing in house what once was outsourced to 3PLS. American Eagle and Zara are examples of companies who have done so.

The pandemic accelerated the use of "m-commerce" or mobile e-commerce, involving shopping through a mobile device such as smartphones or tablets. According to Shopify, in 2021, merchants captured 71% of all online sales via mobile devices. Online retail is expected to keep growing due to the increase in the use of smartphones and tablets worldwide. Social e-commerce is also set for success. Nearly half of Chinese online consumers shop on social platforms (these include applications such as Instagram or Tik Tok).

The Asia-Pacific region and in particular China e-commerce revenue sales is expected to be greater than the rest of the world combined. We are seeing new partnerships between Chinese platforms and international marketplaces. An examples is the recent agreement between JD.com and Shopify where US businesses can list their products on Chinese marketplaces. JD.com is responsible for the fulfillment, transportation, and last-mile delivery of the product.

Last year, we witnessed the return of the B2B segment and consumer-oriented retailers, and brands keep investing in third-party marketplaces. This has also translated into wholesale e-commerce, with more wholesalers launching online platforms on their own sites. In the past, brands and retailers had to rely on events such as trade shows to connect with wholesalers and buy products but this consumer behavior is changing, with more wholesalers connecting directly with buyers online.

The COVID-19 outbreak has highlighted some of the weaknesses of digital technologies and tools and in the context of e-commerce, the main lessons learned include the need for greater cooperation between countries to facilitate the cross-border movement of goods, the implementation of online payment options across younger markets and the reduction of the digital divide. The ongoing effects of the COVID-19 outbreak are highly unpredictable and they impact the platforms business and supply chain operations, demand for products and services, cost of logistics, access to inventory, ability to predict financial performance and in-stock positions among others. For the first time ever, global revenue growth rates for e-commerce are expected to decrease. Supply chain issues and inflation are some of the causes behind the drop in revenues.

Governments are also expected to contribute to the predicted decrease in global e-commerce sales as they attempt to combat inflation. We have observed more countries starting to apply some protectionist measurements to cross-border e-commerce, including sanctions, quotas, permits and licensing processes. An example is how South Korea fair-trade agreement is expected to become stricter in terms of anti-completive practices.

3. Fulfillment Channels: The Mechanics of e-Commerce

Key findings:

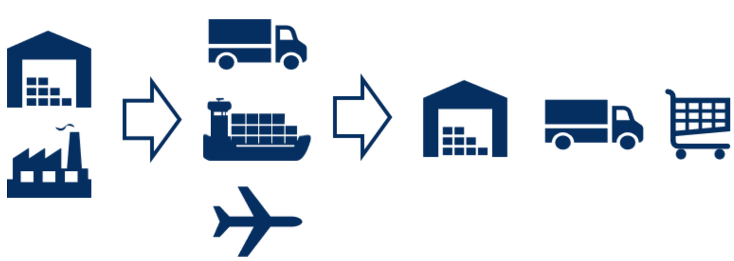
- Cross border and domestic e-commerce are fulfilled through distinctly different channels and using a different set of providers.
- Postal companies, express carriers and specialist e-commerce consolidators are key agents in cross-border fulfillment, where the ability to deal with customs and value-added and other tax regulations are necessary.
- Parcel carriers, postal companies and other ground transportation providers are key participants in domestic and intra-regional fulfillment.
- Air capacity is more important in intercontinental fulfillment, but for domestic and regional fulfillment ground transport is the leader.
- E-commerce remains a key growth driver for the air freight industry, as online transactions keep boosting demand for parcel delivieries worldwide.

Understanding where to find the highest quality opportunities in e-commerce logistics requires an understanding of the mechanics of e-commerce fulfillment and competitive dynamics across the fulfillment chain.

3.1 E-Commerce Fulfillment vs Traditional Retail Chains

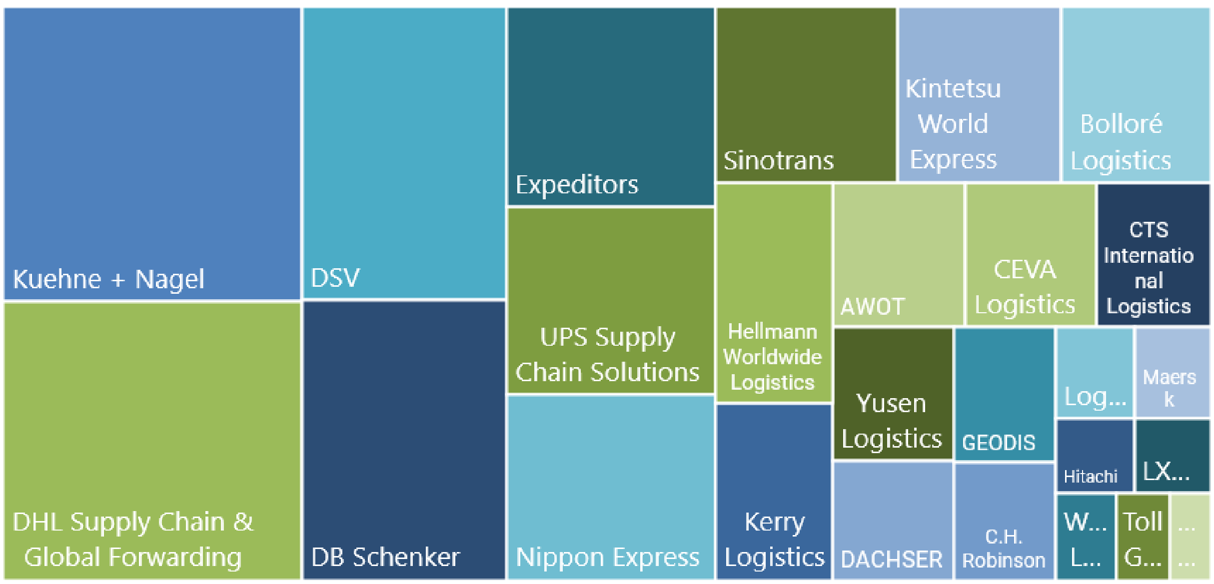
Traditional retail and e-commerce fulfillment channels are fundamentally different in nature and involve a different set of providers. Traditional retail fulfillment largely involves wholesale transportation of large lots between factories, distribution centers and retail outlets using linehaul truck, shipping, and air transportation. Figure 15 provides a simplified overview of traditional retail fulfillment.

Figure 15 - Traditional Retail Fulfillment



The key transportation providers in traditional retail fulfillment are third party logistics providers and freighter forwarders, shipping lines, airlines, and trucking companies. In some markets, rail transport also plays a role in the shipment of containers from port to distribution centers. Shipment sizes tend to be either full or partial container or truck loads. International airfreight in traditional retail fulfillment is controlled by the top freight forwarders (see Figure 16).

Figure 16 - Top 25 Freight Forwarders, Based on 2021 Air Tonnage



Source: Cargo Facts Consulting Analysis of Armstrong & Associates Data

While much of the front end of the e-commerce retail fulfillment from factory to distribution center is like the traditional retail chain, online retail is primarily centered around movement and delivery of small packages or single items, either domestically or cross borders. While some of the top freight forwarders play a role in e-commerce fulfillment, they not particularly geared towards this business.

Figure 17 provides a simplified overview of the e-commerce fulfillment chain.

Figure 17 - E-Commerce Retail Fulfillment

A customer – be it a consumer or business – places an order which is then picked, packed, and dispatched from a seller or distribution center using an inhouse or third-party logistics system that may involve pick up, origin handling, sorting and consolidation, road, and air linehaul, customs clearance, destination sorting and handing, and last-mile delivery to homes, business or pick up points such as retail outlets and parcel lockers. Large e-tailers use predictive analytics to estimate what customer will order and when, allowing them to pre-stock items on delivery vehicles or local distribution points to provide instant or rapid delivery.

Particularly for domestic e-commerce the customer is generally provided with real-time or near-real-time tracking information. Due to the fulfillment options chosen by sellers in cross border e-commerce, tracking information is often not available to the customer.

E-commerce fulfillment involves more parties than traditional retail fulfillment. These include postal companies, express companies, courier companies, independent contractors as well as wholesale transportation capacity providers such as airlines or trucking companies. The traditional third-party logistics providers and freight forwarders play a lesser role in e-commerce fulfillment, either because platforms manage their own logistics or rely on specialist e-commerce consolidators or other providers to organize transport. The way shipments are injected into third party carriers' systems depends on how sellers and logistics platforms manage their requirements. In essence, there are interface possibilities at all stages of the chain. For example, shipments may be handed over to an integrator at origin, injected into last mile networks for delivery without any network impact further upstream.

The next two subchapters describe the mechanics of domestic and cross-border e-commerce fulfillment in more detail. Chapter 4 and accompanying appendix describe how the large platforms manage their logistics requirements.

3.2 Domestic (Customs Union) E-Commerce Fulfillment

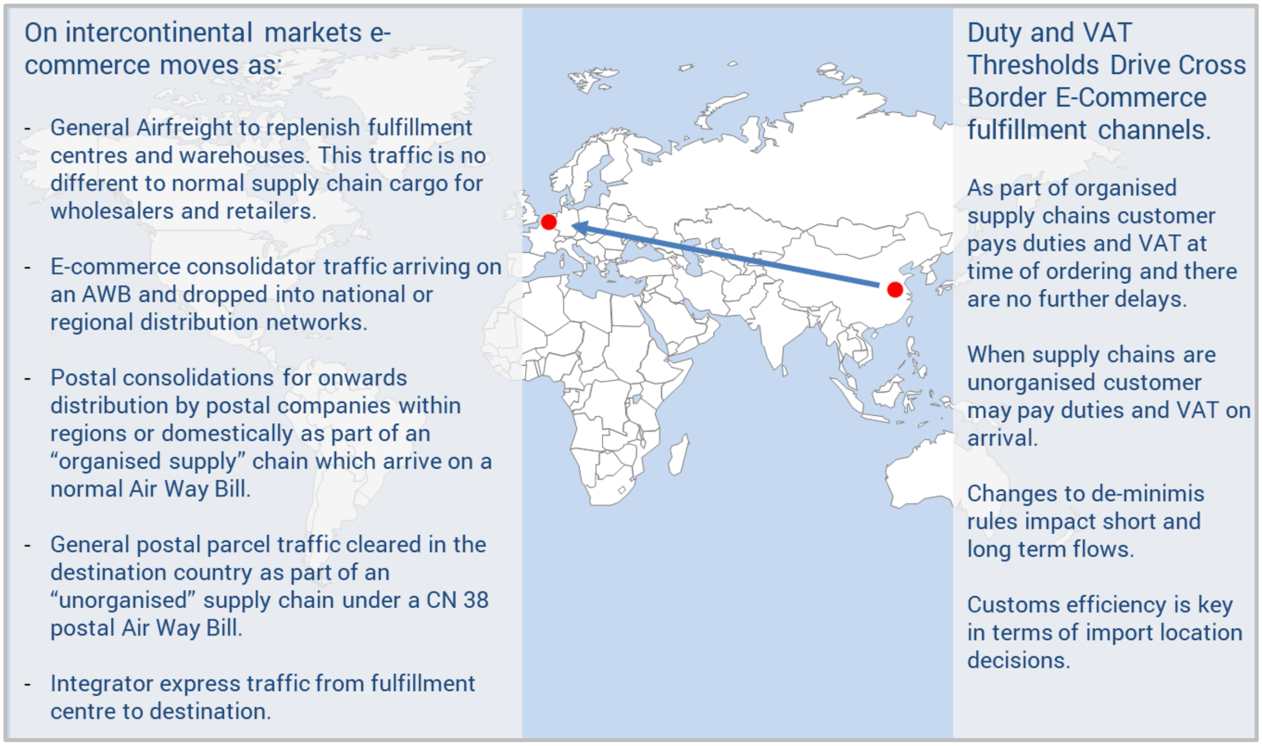
Fulfillment in domestic networks primarily relies on ground transportation, i.e., trucks and vans. For the purposes of our analysis domestic also includes intra-EU or other customs union markets that essentially operate like domestic markets. Some premium traffic moves by air in express or dedicated networks, and driven by predictive analytics, platforms such as Amazon also move inventory between fulfillment centers using air freight to ensure shorter delivery times to market once actual orders have been placed. Some e-tailers are also trialing delivery by drone or other automated vehicles, but so far this type of delivery is still in the experimental stage. More detail of the type of traffic moving in different networks can be found in Chapters 5 (Postal), 6 (Express) and 7 (Air cargo and dedicated e-commerce networks). Figure 18 provides an overview of the mechanics of domestic and intra-regional (customs union) fulfillment. The choice of fulfillment channel and carrier is generally determined either by the seller or e-commerce platform, although in many cases customers can choose a shipping speed and occasionally are also given a choice of different parcel operators.

Figure 18 - Domestic Fulfillment

3.3 Cross-Border E-Commerce Fulfillment

Cross border e-commerce generally involves the use of airfreight, with subsequent on forwarding through postal, express, or other parcel networks (see Figure 19). Fulfillment channels are driven by customs and tax regulations and practices, particularly rules relating to de-minimis, tax-free thresholds and collection procedures. Changes to these have a fundamental impact on the flow of cross border e-commerce.

Figure 19 - Cross Border Fulfillment Channels



Postal, express companies, e-commerce consolidators are the key players in cross border e-commerce. Traditional forwarders and 3PL have tended to remain focused on their traditional business-to-business industrial operations. Most of the important e-commerce consolidators are local Chinese companies which are not household names outside China. We do not view the replenishment of e-commerce provider warehouse and fulfillment center inventory as e-commerce. This type of traffic is no different to normal consumers goods and supply chain cargo moving by air (and ocean freight) for the replenishment of wholesaler and retailer stocks. As such, we have excluded this from our analysis.

However, as e-commerce gains a greater share of overall retail volumes, we see a potential shift between customers – in favor of wholesale traffic to e-commerce warehouses and away from the distribution centers of traditional wholesale and retail companies.

4. E-Commerce Platforms: Shaping Logistics Networks

Key Findings:

- While the big three – Alibaba, Amazon and Jd.com – are the largest global e-commerce platforms by far, we find that e-tailing is becoming more competitive.
- More platforms are turning the corner in terms of profitability, but investors are still willing to underwrite growth with the promise of a golden future, especially looking at a slowdown in e-commerce activity.
- E-Commerce logistics fulfillment networks and service requirements are being shaped by the large global and regional platforms.
- A common strategy across platforms is control over the fulfillment and logistics network. However, for some platforms (such as Amazon) this involves increased insourcing, while most others adopt a hand off approach and are happy to work with third parties to meet delivery commitments.

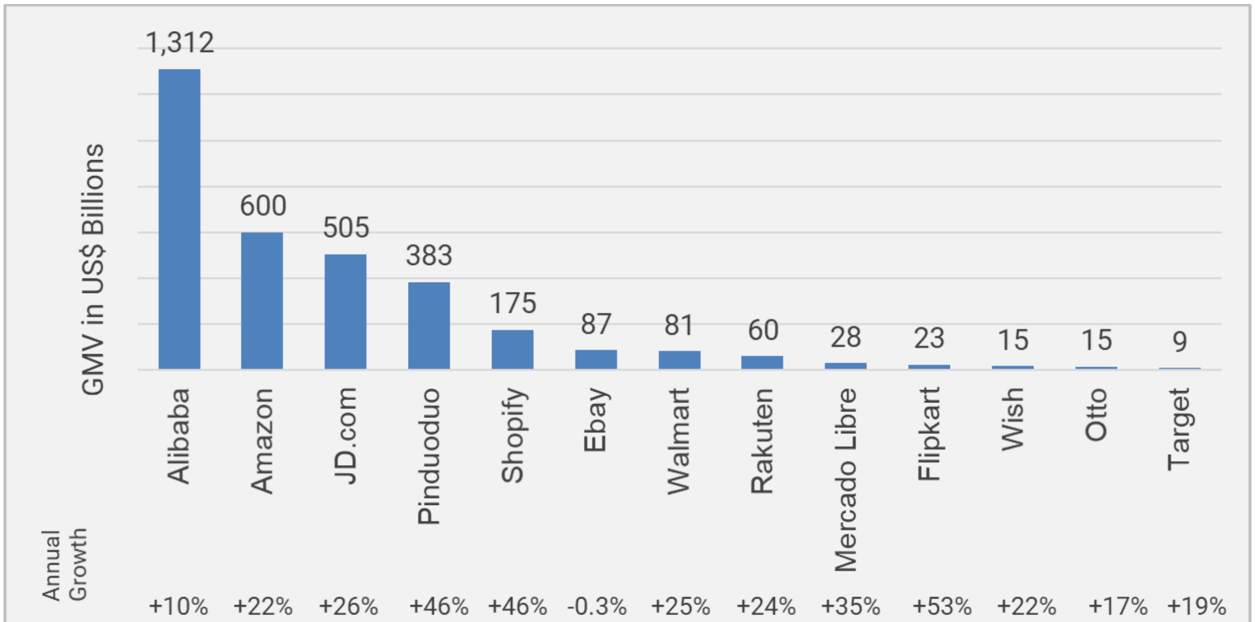
4.1 The Big 3 Drive Global E-Commerce Volumes

With a large share of global e-commerce revenues generated by or via the big global e-tailers and marketplaces, the strategies of the major platforms have a disproportionate impact on shaping e-commerce logistics requirements. As part of our research, we have taken a detailed look at the operations and logistics strategies of 14 key, emerging global and selected regional e-commerce platforms representing approximately 50% of global e-commerce GMV: Alibaba (and its subsidiaries), Amazon, JD.com, Pinduoduo, eBay, Shopify, Walmart, Target, Rakuten, Otto, Mercado Libre, Flipkart and Wish. Most of these companies have become large and powerful buyers of logistics services. Please note that in the case of Target and Walmart, the GMV figure only includes the company's e-commerce business.

We feel the companies selected provide a valuable cross-industry picture of what is happening in e-commerce logistics. This year we expanded our coverage of Target and Pinduoduo and will continue to add other platforms to our analysis where we feel developments are likely to have a material impact on the business and the outlook for air logistics services. As with other parts of the report, we welcome your feedback on the scope of our coverage in the lead up to next year's report, the research for which starts in the spring. A year in the world of e-commerce is a long time.

Figure 20 provides an overview of the Gross Merchandise Value (GMV) of the platforms included in our analysis. GMV is a measure of scale and consists of the sum of revenue conducted with own retail and revenues achieved by third party retailers. For platforms which host third party sellers, the revenue generated by platform itself (also called net revenues) is usually a fraction of GMV. In Alibaba's case net revenues are about 10% of its GMV. This number increases depending on the commissions charged by the platform as well as value-added services provided to sellers, such as fulfillment. This report's Appendix provides a detailed profile of each of the platforms, their logistics operations, expenditure, and strategies. All major and minor platforms except for eBay showed double-digit growth in overall sales volumes in 2021.

Figure 20 - Key Global and Regional E-Commerce Platform GMV in 2021



Source: Cargo Facts Consulting analysis and estimates, Company Financials

In 2021, Amazon sold $600 billion worth of goods — more than double its 2018 sales of $277 billion — with its global GMV up 22% year over year. Most of the growth is attributed to its third-party marketplace, which has been growing faster than Amazon's first-party sales. Since 2018, Amazon has doubled its fulfillment network and now has more than 1.6 million employees. If this annual growth continues, Amazon will likely reach $1 trillion GMV by 2026.

Chinese tech giants (Alibaba, JD) posted their worst quarterly growth in the second quarter of 2022 – with Alibaba, for example, posting its first ever flat year-on-year quarterly revenue growth.

eBay is the only platform that reported flat GMV growth in 2021, with this number falling 10% during the last quarter of the year. eBay recently updated the definition of GMV to include all paid transactions on its platform, including shipping fees and taxes. In the past, eBay was reporting this figure regardless of whether the purchaser and vendor completed the transaction. This change is a move to align with other e-commerce platforms and will provide higher visibility on payment management on a global scale. Competition from Etsy and other e-commerce shops, its continuous drop in sales, and the number of active buyers were reflected in the company's stock, which has also dropped over 15% in the last twelve months.

Founded in 2015, Pinduoduo is now the largest online marketplace for agricultural products in China. Its user base has exploded in recent years, and last year it briefly surpassed Alibaba. Pinduoduo has also been focusing its efforts on growing its client base through large sales events, with profitability being a distant second. The company has the potential to become an even more powerful force when it begins to focus on recouping this investment. Nevertheless, the last twelve months have been somehow disappointing as consumer spending in China is waning amid a broad economic slowdown and rigid COVID-19 restrictions. Since early 2021, Chinese regulators have been waging a campaign to rein in the country's enormous and rapidly growing online economy while the share values of listed Chinese tech companies have plummeted.

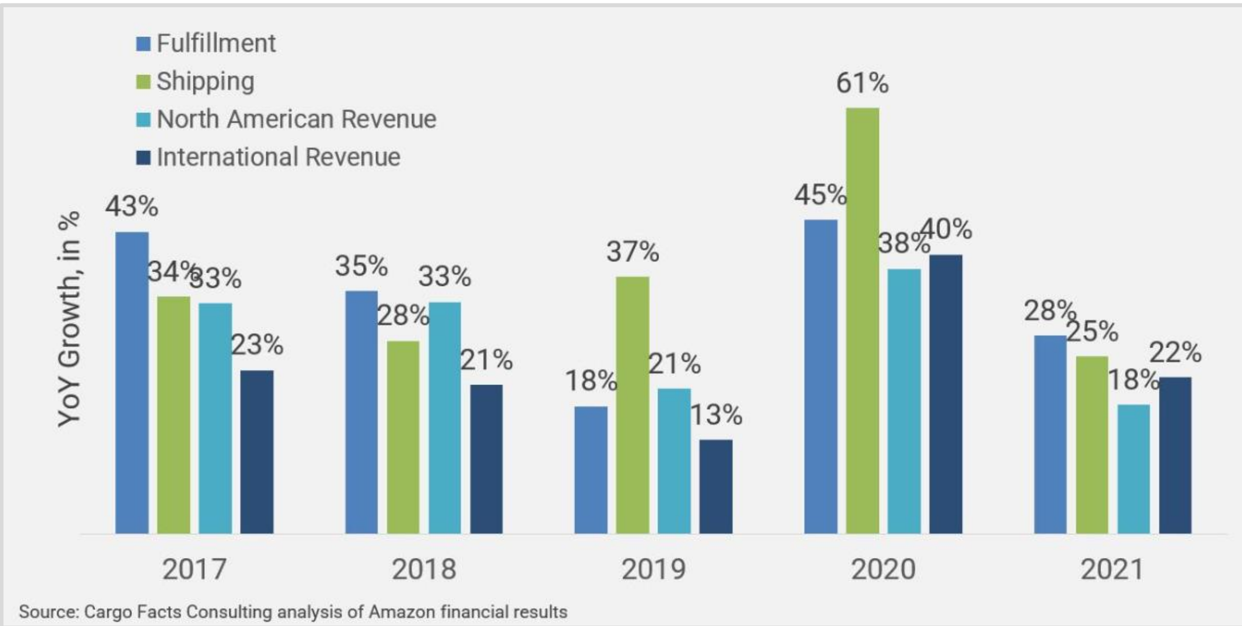
4.2 Key Platform Driven E-Commerce Logistics Trends

In the past, we have identified a few trends that apply across e-commerce platforms – even though geographical scope and scale vary substantially between platforms. These continue to be valid, specifically:

- **Fulfillment costs are still (mostly) rising faster than revenues** – this is both a sign of a shift in service offering as well as a problem. Many platforms (Amazon, Walmart, JD) have moved from two day to overnight, same day or even delivery within the hour. Companies have not recovered the additional cost of this from their customers through their "Prime"-style memberships. This hurts its margins, and consequently transportation suppliers will be pushed harder to lower prices. Amazon has been spending heavily on expanding its fulfillment and more recently, its shipping capabilities. In 2017 and 2018, fulfillment costs grew by 43% and 35%, respectively, while in 2019 and 2020 fulfillment costs grew in line with the increase in amount of their space (see Figure 21 below).

Although the retailer reported a nearly $25 billion operating income, its international division finished 2021 with a loss of $924 million. The loss in 2021 follows $717 million in income in 2020. Amazon said this is primarily due to increased shipping and fulfillment costs from carrier increases and further investment in its network. The company appears confident that efficiencies from its larger network will lead it to profitability, but the constant growth and capital expenditure have many wondering how long this is sustainable.

Figure 21 - Summary of Amazon Revenues and Cost Development 2017-2021



Meanwhile, shipping costs in both 2020 and 2021 have outpaced revenue growth as the company has increased its capabilities.

- **Own controlled logistics is seen as a competitive advantage:** all the above platforms have their inhouse logistics providers, except for Wish, Pinduoduo and eBay. While most run their own fulfillment centers, they tend to rely on third-party carriers for linehaul and last-mile services. Otto is an exception with its own package company, Hermes, as is JD.com, who also runs its own delivery company. Walmart is providing more of its own last mile delivery through its Spark network.

- **Big platforms are shaping third-party provider networks:** Weekend and late evening delivery are becoming more prevalent around the world, and courier working times and delivery times are being driven by arrival of trucks from fulfillment centers. In 2014 Amazon drove the USPS to deliver on Sundays, but it took until 2019/2020 for FedEx and UPS to follow suit. Seven-day deliveries are becoming the norm in most parts of the world, but postal and express companies in Europe are behind the curve.

- **Logistics networks are open to third-party sellers:** where platforms host third-party sellers, these can access the platform's fulfillment networks. This is a logical development as most platforms either rely entirely on third party sellers (e.g., Alibaba) or have seen an increasing share of third-party sellers (e.g., Amazon). However, none of the big platforms have become serious competitors to the traditional 3PL giants like DHL, Kuehne & Nagel, or DB Schenker. Cross border as well as domestic e-commerce fulfillment is a fundamentally different business. Cainiao still has the greatest potential to become a threat to the traditional 3PL business, particularly since its network and providers are also open to sellers utilizing other platforms.

- **Some logistics networks are open to third parties who are not sellers**: JD.com and Hermes, for example, have opened their parcel networks to thirds parties including the public. Cargo Facts Consulting believes that once networks have reached a certain scale and maturity, platforms will seek to use these networks to drive additional revenue opportunities.

- **Moving from Controlled to Insourced Logistics:** to reduce costs and dependency on third-party providers, some platforms particularly JD.com and Amazon have moved from controlled to increasingly insourced logistics networks. This includes both linehaul, last-mile delivery and establishment of non-courier-based networks of parcel lockers and pick up locations. The latest example is Shopify investing in their warehouse fulfillment solutions. In early 2019 Amazon became its own largest carrier. The definition of "control" varies across platforms – for Amazon it involves being much more hands on and asset driven than in the case of Alibaba.

The following chapters discuss how postal, express, and other companies in the logistics business have been positioning themselves to deal with these trends as well as establishing themselves as alternatives to the large e-commerce platforms.

5. Postal Networks

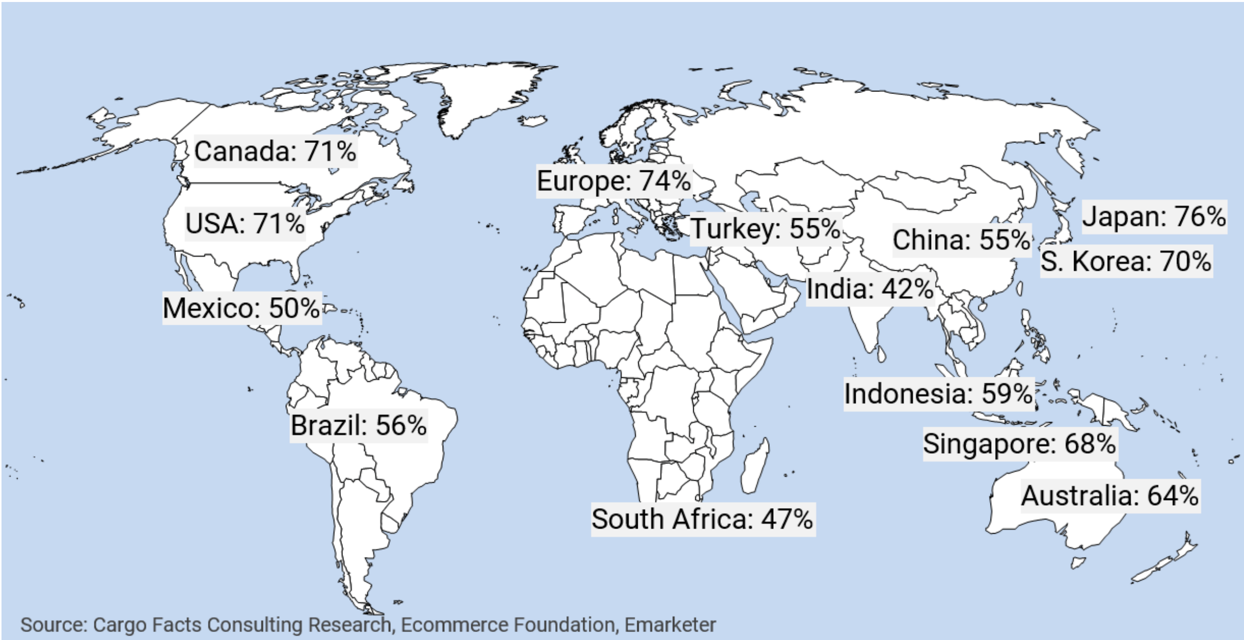
Key Findings:

- Business to consumer e-commerce traffic is becoming the main source of revenue for postal companies as traditional mail volumes continue to decline. As global mail volumes drop, post offices have sought to diversify their revenue streams.
- E-commerce service requirements and volume increases are putting pressure on postal networks which have been forced to adapt operating patterns and invest in physical and IT infrastructure.
- The COVID-19 crisis has accelerated the postal industry's fundamental shift from mail to parcels.
- Postal operators have a unique positioning within their domestic markets and can be a key player in the cross-border e-commerce market if they play it right.
- Understanding the cross-border consumers requirements, as well as key trends is vital to developing a suitable infrastructure and making posts the top choice for consumers.

5.1 All Parcels and No Mail: The Changing Face of the Postal Business

The postal business has undergone fundamental changes over the last decade. During this time, the average share of postal revenues from logistics and parcels has increased from 15% to 25%, while traditional mail volumes have continuously declined and represent about 32% of postal revenues today compared to 46% in 2017. Postal companies are key fulfillment agents in the e-commerce supply chain and most parcels moving through postal networks are e-commerce (see Figure 22).

Figure 22 - Share of E-Commerce in Postal Parcel Networks 2022



Airmail plays an essential role in the delivery of letters and parcels between intercontinental and within key domestic markets. According to the International Post Corporation (IPC), the global postal industry registered $427 billion in revenue in 2019 while our estimates show that this figure was about $450 billion in 2020, resulting in an increase of 5% year-over-year. Even though mail volumes keep decreasing, parcel volumes continue to rise due to the growth in e-commerce. Amid a global epidemic, postal networks throughout the world continue to provide value to consumers while focusing on creating growth, improving efficiency, and investing in the future. The growth in cross-border as well as domestic parcel traffic has also driven renewed growth of global postal traffic carried by air. Even though cross-border e-commerce traffic continues to grow strongly, there is an increasing amount of cross border traffic destined for postal networks that travels as general airfreight and not under a CN 38 postal airwaybill. Also, most of the e-commerce and express activity is covered under air freight figures and not airmail statistics.

5.2 Postal Networks: Financial Performance, Challenges and Outlook

Postal networks now can contribute to the growth and expansion of cross-border e-commerce transactions thanks to e-commerce. Global, regional, and local package delivery companies are all competing for delivery contracts in the parcel service industry. Meanwhile, online retail growth has slowed in numerous established e-commerce sectors in recent years, with significant e-retailers seeking to outsource their delivery operations. As a result, growth rates among postal businesses in 2020 have varied significantly.

However, not all postal operators have done well financially and in cases such as the United States Postal Service (USPS), their losses continue to grow. The Royal Mail (United Kingdom) or La Poste (France), on the other hand, have expanded their online presence and cross-border reach by leveraging e-commerce solutions and expanding their delivery capabilities. These organizations have expanded their services beyond traditional delivery to include warehousing or the development of their own e-commerce platforms to cater to small and mid-sized enterprises fearful of the big e-commerce players. Those postal firms that have been successful have consistently invested in both technology and infrastructure.

There are various needs and constraints when it comes to serving customers from various markets through cross-border transactions. E-commerce has the potential to increase the postal industry, but it comes with significant obstacles, such as the complexity of the postal product offering, the lengthy customs process, and a lack of suitable infrastructure support. Customers want simple and economical postal services, thus postal operators must take a customer-centric approach, offering a broad choice of cross-border e-commerce shipping alternatives that can fulfill customers' expectations on all levels.

We have analyzed the largest postal companies in the world in terms of volume and revenue. The consistent trend continues, and we keep observing revenue growth in their parcel business units, fueled by increased e-commerce activity while the mail business is in decline. The shift from traditional letters to parcels is irreversible and most postal operators are also developing solutions for international shippers to consumers (B2C) and expanding their cross-border portfolio of e-commerce services. Most of postal companies in the EU have developed a solution called the E-Parcel Group (EPG) to boost the reliability, speed and tracking of cross-border e-commerce.

Traditional mail remains an important source for the postal operators, but e-commerce is becoming the main driver for the delivery business, filing the gap caused by the declining volume in mail and increasing volume in parcels. Furthermore, our research shows that postal companies are often better positioned to service domestic networks, but they must rely on private logistics providers and express operators to fulfill their cross-border offer.

The industry continues to grow profitably despite continuous structural changes. The postal sector has been shaken up by the digital revolution: although traditional letter delivery is declining, postal services face fierce competition in the e-commerce parcels market. While growth rates varied greatly among the postings examined, more than three quarters reported stable or increased sales over the course of 2020, with the majority citing e-commerce as a main growth driver.

Postal networks quickly adjusted their networks to provide an unanticipated volume increase which was bigger and far longer than any prior high across the world. Other common key trends in the crisis reported by posts were: B2C deliveries increased in most product segments (although trends are changing with lockdowns getting extended); local small and medium-sized companies sent additional parcels; home deliveries increased and postal web shops saw their online sales rise significantly.

Digitization continues to drive industry-wide mail volume decrease. In 2020, the average drop in postal volume increased to 7.2% from 5.4% in 2019. The COVID-19 crisis has accelerated structural changes in most countries and postal service has remained resilient despite difficulties. While e-substitution has seen a decline in revenues, improvements in mail rates and e-commerce packages have helped drive growth. As a result, postal revenue rose 5.3% in 2020 even though margins remain thin, in the 1-2% range according to the latest IPC report. Due to a high increase in the number of B2C parcels, these now account for more than half of overall revenue for some posts. In 2020 and 2021, postal networks reported that their parcel revenues keep increasing but prices are under pressure due to the bargaining power of larger operators.

To survive, postal companies must remain competitive and for that, they need innovate and provide an enhanced customer experience and service offering. Those players willing to innovate are looking to optimize their operations in the areas of delivery, transport, pick-up, sorting and handling and many postal networks remain leaders in parcel delivery due to their extensive physical presence and dense networks. Postal networks are working on automating their logistic centers with higher processing capacity, allowing them to meet all delivery time requirements and improving the tracing and tracking information so customers can manage volumes in real-time and more efficiently. Some of these initiatives include the adoption of new automation technologies to support production and sorting processes and the implementation of lean production systems with the goal of reducing the number of full-time employees across various sites. The long-term objective with this labor reduction is to lower operating costs.

The COVID-19 pandemic has demonstrated the importance of worldwide collaboration amongst post offices in ensuring the postal industry's commercial continuity. Cooperation will be critical in the years ahead, not just in recovering from the crisis, but also in addressing the long-term problems and possibilities that lie ahead.

5.3 The Universal Postal Union (UPU) and Cross Border E-Commerce

Established in 1874, The Universal Postal Union (UPU) is a special agency of the United Nations (UN) created with the goal of coordinating postal agencies among member nations. In the absence of individual bilateral agreement between postal authorities, UPU arrangements regulate onforwarding costs and service requirements for mail and parcel volumes moving between postal networks.

In October 2018 the United States informed the UPU of its decision to withdraw from the organization, effective in October 2019. However, this decision was revoked, and the US decided to stay in the Union with the condition of being able to set its own inbound postage rates. By retaining its membership in the UPU, the US retained the leadership in the global postal organization and served as a major stakeholder in the negotiations of new terminal dues. Starting July 2020, all countries with imports over 75,000 tonnes of mail can set their own charges for the final delivery of postal traffic from that country. Under this new rule, UPU members can raise their rates up to 70% of the price of domestic delivery and those countries below the 75,000 threshold can increase their charges after 2025. Postal operators are waiting for the US to make the first move and raise prices before other members follow.

Our research shows that this new regulation comes with a high level of complexity and postal companies will have to renegotiate agreements and rates on a case-by-case basis with the goal of remaining competitive. However, we expect that over time UPU terminal dues may become less relevant as cross border e-commerce moves towards a more controlled logistics chain which involves cross border movements taking place under a standard rather than CN38 postal waybill, with post-clearance onforwarding taking place under bilateral agreements between postal companies.

This also has an impact in the traffic carried by express operators that use USPS for final-mile deliveries. UPS and FedEx have a 2% margin on terminal dues if they manage the paperwork for the shipper (which is the case most of the time). We do not expect that the changes will have an impact in the flow of packages from China since many Chinese online platforms already have warehouse and distribution centers in North America and Europe while they use domestic logistics operators for final-mile services. We may see more Chinese companies increasing their inventory levels in those markets with the goal of speeding up deliveries and avoid import taxes.

The UPU oversees the Express Mail Service (EMS) program, a global service with the most customer access points in the world, providing last-mile coverage worldwide and supported by a premium postal delivery network. Some of its features include end-to-end tracking, priority handling, acceptance at any post office, pick-up from customer's premises, signature at delivery and delivery to addressee's premises. However, since cross-border international deliveries require the involvement of two postal companies, the EMS features vary depending on the services offered by each postal agency. EMS claims to be the fastest postal product, combining visibility, speed and reliability with an excellent customer service which continuously improves performance and responsiveness to meet the demands of e-commerce. However, our research shows that EMS growth has lagged the global integrators DHL, FedEx, and UPS.

The Inter-American Development Bank (IDB) and the UPU have signed an agreement to modernize postal services in Latin America and the Caribbean. The partnership is expected to enable the IDB to support countries as they incorporate the international guidelines and standards issued and promoted by the UPU and the agreement's goal is to promote regional integration and trend while strengthening value chains and boosting the region's connectivity. This will also allow for a stronger connection between communities and business in Latin America.

Airmail is still an essential component in airline revenue but there are limited regulations and standards and the UPU in cooperation with IATA are trying to fill this gap by drafting a Framework Agreement. This document aims to become the standardized starting point for airlines and postal firms and will include more details pertaining performance, dangerous goods, liability, and messaging. This initiative will offer a new degree of openness to the airline-postal partnership, and it is confirmation of the already existing collaboration and dedication to quality.

6. Express Networks

Key findings:

- Express carriers have traditionally played an important role in the distribution of e-commerce, both in their regional and cross border networks.
- Business to consumer traffic share in express networks surged from around 48% in 2019 to 65% in 2020.
- The increase of business-to-consumer traffic in express networks is a longer term trend as has been accompanied by a decline of revenues per package particularly in domestic networks, although in 2021 we have observed a reversal of the yield decline.
- Recently, there has been a decoupling of integrators from e-commerce platforms as express carriers develop and expand their own end-to-end e-commerce products.

6.1 The Role of Express Carriers in E-Commerce Distribution

While postal networks are the primary fulfillment option for e-commerce packages, all the major global and regional integrators play an important role in both cross border as well as domestic distribution. In the context of this report, we have taken an in-depth look at the e-commerce product offering, current and expected future exposure to the business. Specifically, we have looked at DHL and its Indian subsidiary Blue Dart, FedEx, UPS, SF Express, EMS/China Postal Airlines and Aramex. All of these but Aramex have their own dedicated air networks. For the purposes of this analysis, we have excluded Purolator (Canada), Estafeta (Mexico), YTO (China), Toll (Australia) as well as the express air operation run by Australia Post. Our Air Express Market Outlook includes a more detailed analysis of the major global and regional express operators that focuses on the overall (and not just e-commerce-related) express business which will include all the express operators mentioned earlier. A new edition of the air express outlook is expected to be published within a month of this report.

Express companies participate in the e-commerce package delivery and fulfillment business on different levels, namely as:

- **Subcontractors to e-commerce platforms and major retailers**: In 2020, UPS generated 13% of its revenue with Amazon alone – up from 11.6% in 2019. FedEx and UPS generate significant volumes from companies such as Walmart, Target or sellers operating via Shopify. The bigger the ground network, the higher the B2C share; while we have seen significant B2C-driven growth of air shipments, lower-cost ground networks are the main means of e-commerce fulfillment. For example, U.S. domestic express yields average between $13 and $20 per shipment, and international yields are around $50 to $60 a shipment, which does not lend itself to a market where customers expect to receive free shipping.

- **Subcontractors to postal authorities**: for example, in FY 2020 the United States Postal Service spent $2.2 billion with FedEx and $203 million with UPS which included a sizeable portion for airport to airport delivery of priority mail and priority mail express. These volumes ultimately included e-commerce packages shipped via the Postal Service.

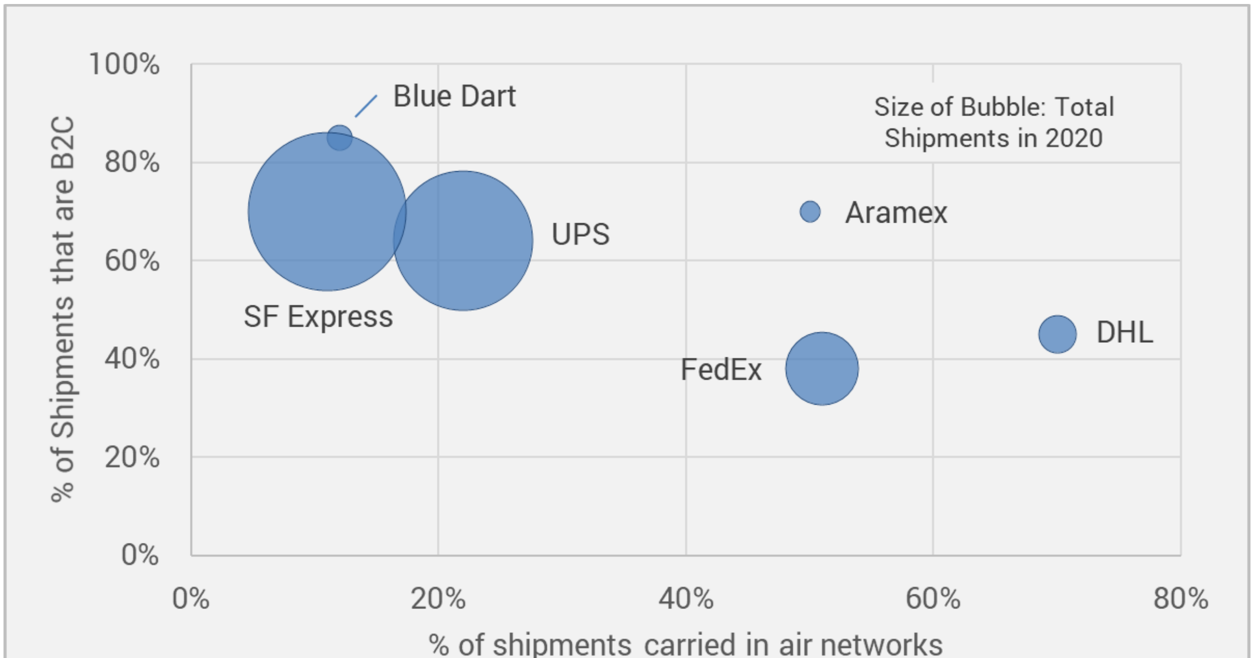
- **As a service provider for cross-border fulfillment**: Many of the customers in this segment are smaller to mid-sized retailers and major brands who operate their own-e-commerce platform independent offerings. FedEx became the first integrator to apply the new Chinese cross-border e-commerce sales policy in which export sales can be handled by a foreign warehouse delivery model or via a direct B2B mode. Customers of the Shopify platform can choose UPS, FedEx or DHL for their cross-border fulfillment requirements.

6.2 Express Carrier Growth Increasingly Tied to E-Commerce

While all express carriers agree that the e-commerce is the key driver of future growth, they are less specific about the current level exposure of their businesses to this type of (primarily business-to-consumer) traffic. Our research has found that the biggest dependence on e-commerce traffic is in ground rather than air networks and that intercontinental and regional air networks carry a more diverse mix of traffic with business-to-business volumes outweighing business-to-consumer volumes.

Across the express business, the share of business-to-consumer shipments that is increasing faster than business-to-business shipments currently stand at approximately 65% of shipment volumes. This is higher than in 2019, where closer to 48% of express traffic was B2C, primarily due to a pandemic induced surge in online shopping and drop in business-to-business traffic. Figure 23 illustrates our analysis of the share of business-to-consumer vs shipments carried by air for key global and regional express carriers in 2021.

Figure 23 - Express Carrier Share of B2C vs Share of Shipments Carried by Air 2021



Source: Cargo Facts Consulting analysis of financial reports and estimates

While FedEx, and DHL are primarily business-to-business focused air express providers, UPS, SF Express and Blue Dart operate extensive ground and last mile networks with maximum coverage.

B2C shares in 2020 were running at much higher rates than in 2019. For UPS the B2C share – usually at around 50% across all products increased to 67%. Its dependence on Amazon also increased from 11.6% to 13.3% in revenue which represents a 31% year on year growth. Meanwhile, Amazon reduced its dependency on UPS: in 2020, 18.4% of its global shipping spend was with UPS compared to 22.7% in 2019. DHL Express B2C share increased from 35%+ in 2019 to 45%+ in 2020. UPS B2C shipments represented 64% of average daily volumes in 2020 up from 54% in 2019. The differences in air share between companies are largely historical: DHL has been primarily and international air express company since its founding in the 1970s, while FedEx grew from an air only to a ground-based operation through FedEx Ground and TNT. UPS has for most of its history been a ground-based company. SF, China's main express providers has grown as a combined air and ground express company. Business to business traffic growth in 2021 has been improving and as such we see the business to consumer share coming back down closer to 2019 levels in the coming years.

While increasing e-commerce package traffic has been positive for utilization of sort facilities and both air and ground linehaul networks, it is increasing last-mile delivery costs due to the requirement to deliver to lower-yield shipments to lower-density locations. Furthermore, the increase of business-to-consumer traffic in express networks has seen a decline of revenues per package particularly in domestic networks.

Table 2 show the summary of yield and volume developments in 2021 and 2022 (year-to-date where data is available). US and China domestic have both seen a surge in volumes but yields have dropped in 2021. In domestic markets, 2020 was in many ways like 2019 – volumes were up, and yields were down as air express networks carried higher B2C shares. On international markets, express volume growth accelerated compared to 2019, but yield trends were similar. However, overall air cargo yields saw greater increases in 2020 – closer to 30% for the full year. When you are getting on average $55 per shipment there is not much higher you can go. 2021 has been somewhat different: volume growth is still strong, but in the US domestic market, per package yields have gone up.

Table 2 - Express Operators: Summary of Volume and Yields Development (2021)

Company	International Export Volume	International Export Yield	Domestic Volume	Domestic Yield
DHL (Jan-Dec 2021)	+ 11% ↑	+ 15% (+11% in $) ↑	- -	- -
FedEx (Dec 2020-Nov 2021)	+ 17 % ↑	+ 8% ↑	+ 11% ↑	+ 5% ↑
UPS (Jan-Dec 2021)	+ 7.2% ↑	+ 15% ↑	+ 0.8% ●	+ 11% ↑
SF Express (Jan-Dec 2021)	- -	- -	+ 31% ↑	-10% ↓

Source: Cargo Facts Consulting analysis of company financials, UPS domestic volumes exclude Ground, SF domestic volumes do not

In 2022, volumes are down but yields remain up. This is in part, due to the increase in B2B activity.

Table 3 - Express Operators: Summary of Volume and Yields Development (2022)

Company	International Export Volume	International Export Yield	Domestic Volume	Domestic Yield
DHL (Jan-Jun 2022)	- 5 % ↓	+ 21% (+10% in $) ↑	- -	- -
FedEx (Dec 2021-May 2022)	- 2 % ↓	+14% ↑	- 8% ↓	+ 17% ↑
UPS (Jan-Jun 2022)	-2.9% ↓	+ 11% ↑	- 5.0% ↓	+ 15% ↑
SF Express (Jan-Jul 2022)	- -	- -	+1.2% ●	+3.5% ↑

Source: Analysis of company financials, UPS domestic volumes exclude Ground, SF domestic volumes do not. For UPS and FedEx domestic represents US, for SF Express, domestic represents China. As at 19 Sep 2022

The lack of air capacity and supply chain disruptions have been good for international air express volumes and yields. Domestic U.S. volume growth has underperformed international growth, but per-package yields have also increased. Part of this is due to the changing mix of B2B vs B2C traffic.

In 2020, our estimate of B2C traffic in express networks jumped from about 48% to 65%, thanks to a pandemic-related surge in online shopping. With things a little more open, we expect the 2021 figure to be lower. UPS, for example, mentioned in its earnings release that it expects full-year B2C share to come out at around 61%. This compares to about 64% in 2020 and 50% in 2021. Its international business particularly has seen a shift in the mix of B2B vs B2C traffic. In Q4, B2B was up 4.7% (compared with a decline of 8.7% in Q4 2020) and B2C was down 18.4% (compared with a 104% increase in 2020).

On the topic of UPS, in 2021 the company generated $11.4 billion or about 11.7% of its revenue with Amazon. In terms of exposure that is less than the 13% share in 2020, but still represents a growth of 3.4%. Even as Amazon continues to expand its own network, the two companies remain tied together.

Overall revenue growth for UPS in 2020 was 15% to $97.2 billion, with the international package business growing at 23%. For 2022, UPS expects growth of about 5.5% in U.S. domestic and 7.7% in its international business, and therefore expects to meet its 2023 targets a year early.

Meanwhile, SF Express, which as a company is now 50% bigger in revenue terms thanks to the Kerry Logistics acquisition, saw Chinese domestic express volumes increase by 31%. Yields, however, did not increase thanks to an increasing B2C and ground share. SF's share of air express has dropped from around 20% of total volumes to around 10% over the past few years.

Over the coming years, we expect growth to moderate. We still expect international express traffic growth to be around 11% in 2021, but average growth rates should be a more modest 4.3% in the coming years. U.S. domestic air express growth is likely to be lower than the 9.6% growth we expected for 2021 and more in the 6% to 7% range. For the coming five years our forecast predicts growth of about 5% per year (or about 3% if you exclude the effects of B2C e-commerce moving in express networks).

6.3 Threat or Opportunity: How Express is Responding to E-Commerce

The growth of the big e-commerce platforms with own-controlled fulfillment networks are creating potential competitors for the big integrators. With its own parcel networks open to the public, JD.com and Otto (through Hermes) are the furthest in terms of creating their own integrated platforms. In their financial filings, all the integrators acknowledge the threat of emerging competition from their customers. Some have chosen to draw a line under a selection of their platform relationships while others remain firmly aligned. In 2019, FedEx cancelled both its Ground and Express contracts with Amazon to focus on a future without the e-tailer and platform. UPS, meanwhile remains firmly aligned with Amazon and as the US giant expands its own network, UPS has the most to lose. In Europe, companies like Deutsche Post DHL have also seen volume growth slow as Amazon has insourced more volumes. This was particularly the case in 2020, where Amazon made a major switch to own controlled deliveries. However, in Europe the e-commerce market is more diversified than in the U.S., where Amazon is by far the most dominant player, so a loss of volume may not hurt as much there.

In recent years, DHL, FedEx, and UPS have gradually expanded their capital spending. All three have been investing substantially to solidify their global networks and seek an edge in the hotly contested e-commerce delivery sector, from aircraft and route optimization to robotics. While the geographical scope of these the different e-commerce platforms is very different, they share a lot of similarities – specifically a focus on own controlled logistics, increased reliance on third party sellers and a shift to faster shipping. This is having fundamental implications for companies providing logistics services. Platforms are becoming integrated commerce, logistics and financial providers, and have made moves to insource volumes where possible to drive costs down.

However, all integrators have been making changes to their businesses to profit from e-commerce growth possibilities without having to take the pain of higher last-mile delivery costs. Some companies are successfully implementing programs that involve concurrent investments and measures to reduce costs Our analysis has identified a series of actions that can help express carriers achieve this, including:

- **Service Expansion**: 7-day deliveries and pick-ups, same day capabilities, later cut offs. For example, both FedEx and UPS moved to offer 7-day delivery starting in early 2020. USPS, thanks to Amazon was the leader in offering 7-day delivery after Amazon pushed the company to do this following UPS service failures in the 2013 holiday season.

- **Infrastructure investments**: new sorting and fulfillment facilities to reduce unit costs as well as cater for increased volumes.

- **IT Investments**: for example, to allow residential customers to choose delivery times, saving the costs associated with missed deliveries.

- **Alternative Last-Mile Channels**: through retail outlets or other pick up points. All the integrators use retail locations as part of their worldwide network to reduce the cost of last-mile delivery.

- **Cost Reductions:** shift from air to road (e.g., FedEx Express making greater use of TNT road network, including a major restructure of its European air network announced in 2021), realignment of their own networks (e.g., FedEx bringing Smartpost back inhouse).

- **Offerings for Small and Medium-Sized Business and cross border e-commerce:** this goes back to the root of the express business, which has traditionally focused on providing time-definite services including customs clearance to small and medium-sized businesses. However, the need for economies of scale mean that express carriers cannot afford to ignore e-commerce platform business opportunities.

While most of the growth in the business (at least in people's minds) has been focused around the big three, we find that the e-commerce space is becoming more diverse. Some of the highest growth rates are being achieved by platforms other than Alibaba, Amazon and JD.com. Shopify, a hosting platform for online stores, almost doubled the value of merchandise transacted via its system. The venerable Walmart now generates 12% of its U.S. revenue and 14% of its international revenue from online sales, up from 7% and 10%, respectively, in 2019 and 2020. Mercado Libre, the primarily Latin American platform saw its GMV increase by 50% in 2020. This creates new opportunities for express companies to grow their traffic base without becoming joined at the hip with Amazon and co.

FedEx Express signed an expansion agreement in June 2022 with Guangdong Airport Authority Logistic Company for a new FedEx South China Operations Center at Guangzhou Baiyun International Airport (CAN) to strengthen cross-border trade between South China and other global markets. The 41,000-square-meter expansion, which is expected to be operational in 2027, will be located within the FedEx Asia Pacific (APAC) hub and is more than double the size of FedEx's current gateway at the airport. Indeed, e-commerce market growth in Asia continues to be one of the driving factors for new freighter aircraft, accounting for roughly 40% of long-term global demand for new airplanes as carriers build out their express networks. Express air cargo volumes, which continue to be boosted by e-commerce demand, is ultimately expected to outgrow general airfreight volumes. FedEx has also been bolstering its air network, and recently launched routes connecting Christchurch Airport (CHC) to Auckland Airport (AKL) and Melbourne Airport (MEL).

DHL eCommerce Solutions is planning to invest 560 million pounds ($668 million) in its U.K. e-commerce branch, DHL Parcel UK, to expand infrastructure and invest in digitization and sustainable logistics. This plans include the construction of a new, 25,000 square-meter hub near Coventry Airport (CVT) in England, upgrading the company's fleet to include alternative fuel vehicles and creating new collection and delivery depots around the U.K. The project fulfills two DHL goals: investment in e-commerce and expansion and modernization of its European network. In 2020 and 2021, DHL reported record revenue for its eCommerce Solutions division. The company also plans to invest more than $300 million in the next five years in eCommerce Solutions in the U.S., adding 70% more square footage, automating all U.S. distribution centers, and upgrading its current IT platform.

7. E-Commerce Demand for Aircraft Capacity

Key findings:

- Amazon and MercadoLibre are the only e-commerce platform that has committed to dedicated air capacity while other platforms make use of air capacity though commercial arrangements with express companies and airlines.
- Amazon is now the fourth largest freighter customer worldwide.
- E-commerce is a growth segment and both airlines and airports can position themselves to take advantage of this growth by moving beyond being mere capacity providers and landlords.
- Participating in higher value-added activities requires both investments and partnerships.

These days, we tend to look at the air logistics business as a combination of four segments: general cargo, express, e-commerce and mail. General cargo accounts for roughly 80% of international and less than 5% of domestic cargo and is primarily driven by industrial production, global supply chains and perishables. Express accounts for around 18% of international and about 90% of domestic freight traffic. Mail – which consists of letters and small parcels accounts for about 3% of international airfreight. E-commerce accounts for about 17% of international airfreight, but is spread across multiple segments – air cargo, express and postal traffic.

7.1 All about Amazon: Dedicated E-Commerce Networks and Contract Flying

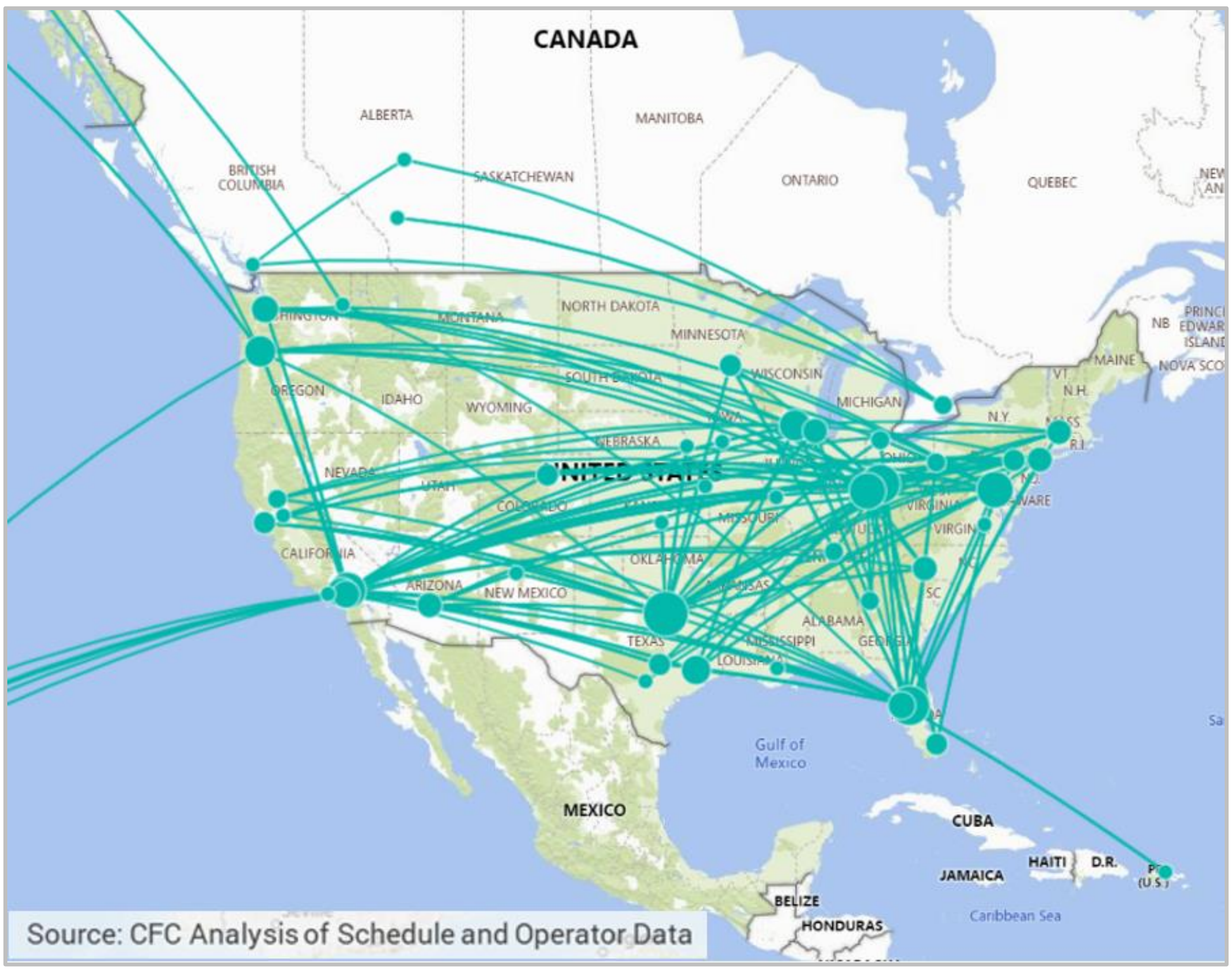
Amazon is now the fourth largest customer for aircraft capacity, only behind FedEx, UPS and DHL Express, and ahead of SF Express. By the end of 2022, Amazon will be operating a dedicated fleet of around 100 aircraft, mainly 767s and 737s spread across the US, Canada, and Western Europe. This is 20 more aircraft than a year earlier. It is worth reminding that prior to the end of 2015, Amazon did not operate any dedicated aircraft.

Amazon’s dedicated flying essentially consists of a two-part structure: aircraft leases and separate operating agreements. Additionally, the company pursues arrangements that give it the option to acquire at least a significant portion of its contractors.

Its network is operated by a mix of third-party subcontractors – ATSG Group, Atlas, Sun Country, and Cargojet in North America and ASL Airlines in Europe. The aircraft themselves are largely leased – from ATSG's CAM, Atlas' Titan and GECAS. However, in late 2020, Amazon also purchased 14 ex-Delta and Westjet aircraft outright which following conversion will be handed over to third party operator to fly. During 2021, Amazon also announced a commitment for turboprop capacity.

Amazon currently operates a network with 160 flights per day or about 4800 per month. This compares to 15,000 and 12,000 monthly flights for FedEx and UPS, respectively. Figure 24 provides an overview of the company's air network in the US.

Figure 24 - Amazon Air Network, Summer 2022



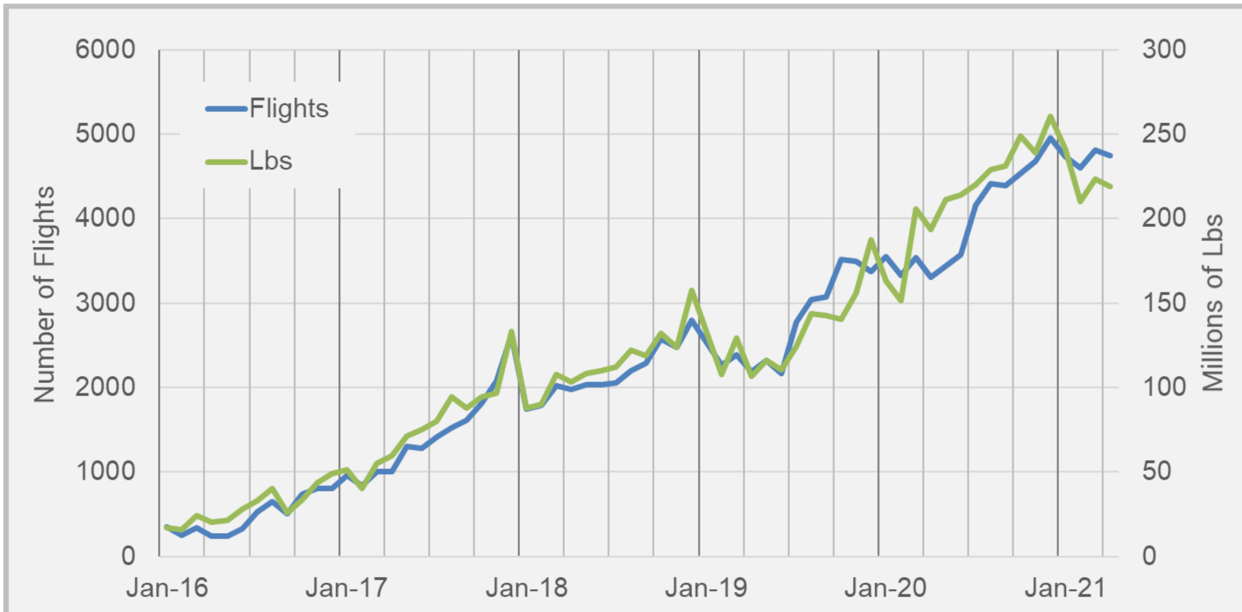
Source: CFC Analysis of Schedule and Operator Data

In August 2021 Amazon commenced operations of its $1.5b Air Hub at the At Cincinnati/Northern Kentucky International Airport, (CVG), which will likely see a consolidation of existing Wilmington and

Cincinnati services and more hub and spoke operations. The size of its air hubs in the US varies between 20,000ft^2 to 800,000 ft^2 (approx. 2000-75,000m^2).

Since its beginning in the last half of 2015 Amazon's air network has grown substantially in scale. Its air network moves about one third of the volumes moved by UPS and about one fifth of what FedEx moves. Figure 25 provides an overview of the evolution of the e-tailers dedicated air network since January 2016. Until mid-2019, the number of flights operated tracked tonnage flown, with a peak before Christmas. When the smaller 737-800 was introduced, flights naturally grew faster than tonnage. During the second quarter of 2020, volume utilisation on aircraft increased due to the increased e-commerce volumes and improved network management. In Q1 2021 and Q1 2020 Amazon grew its dedicated air network substantially, with flights increasing by 30% and 45%, respectively.

Figure 25 - Amazon Air Weight Uplifted and Flights Jan 2016 - April 2021



Source: Cargo Facts Consulting analysis of ATSG, Atlas and Sun Country flying for Amazon, Form 41 t100 segment data

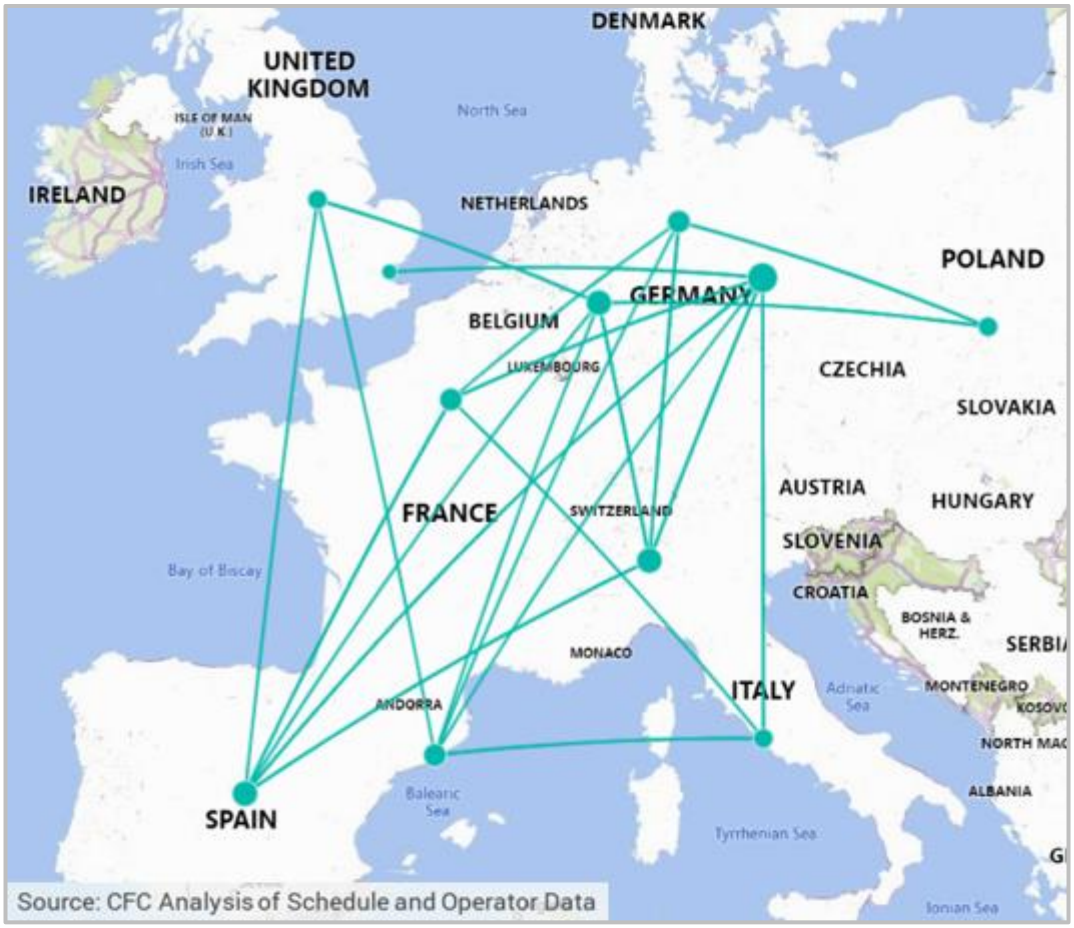
Meanwhile, Amazon's European network has also seen significant growth. Within the space of a year, the Amazon dedicated European network has grown from then to thirteen cities and from thirty to forty sectors. All flights are operated by ASL Group airlines. As of the current summer season ASL has been operating a total fleet of 11 737-400 on and ACMI basis and 2 737-800 on a CMI basis for Amazon.

Europe represents the company's main international market, with Germany and the U.K. alone accounting for 8% and 6% of company revenue, respectively. In 2020, Amazon's European revenue increased by 36% to approximately $50 billion. Going forward, we expect a transition from 737-400 to 737-800 and larger aircraft but given geographical proximity of main markets it is unlikely that the European network will reach anything close to the scale of the US network.

In August 2021, Amazon launched plans to spend $125 million to transform two existing buildings at the airport. The agency was set to receive $157 million in rent over a 20-year lease and an upfront payment of $150 million. However, the company and the Port Authority of New York and New Jersey scrapped plans for a new air cargo facility at Newark Liberty International Airport (EWR). This project was criticized by activities and residents who opposed to this proposal, claiming that it would impact the surrounding communities by air pollution.

Figure 26 provides an overview of Amazon's current network. Our interactive map application also provides additional detail on network evolution and flights by station.

Figure 26 - Amazon EU Air Network, August 2022



Currently, Amazon's network is focused around connecting UK, Germany, Italy, France, and Spain. Amazon has increased its investment in Leipzig, leading to additional intra-European connectivity but so far, there has not been any intercontinental traffic. In the last year, Amazon has started flying to Poland and has increased frequencies across its key cities of Paris, Madrid, Cologne and Barcelona.

7.2 Dedicated Flying for Other Platforms

Amazon is unique in its large-scale push into dedicated and branded air capacity, but other platforms also make use of air capacity – either indirectly through use of express or postal distribution channels or though dedicated charters. Not all platforms have sufficient scale in the markets they operate to be able to justify large scale dedicated air operations. Alibaba and Jd.com do but have so far and they both keep expanding their air freight operations through different strategic partnerships.

Alibaba's logistics arm Cainiao keeps increasing its cross-border charter activity and in 2021, they partnered with BEST, a leading supplier of logistics and supply chain solutions in China and announced the introduction of a full-chain logistics service to send packages from China to Vietnam, Cambodia, and Thailand. When shoppers in these countries choose this shipping option, their packages are sent from BEST's warehouse in Shenzhen to Hanoi, Phnom Penh, and Bangkok after clearing customs. But Southeast Asia is not the only region where this is taking place. Cainiao also partnered with LATAM and Atlas Air to expand its network in Latin America with the goal of linking Hong Kong to Bogota, Santiago, Sao Paulo, and Lima, in response to the increasing demand of e-commerce products from China to Latin America. The implementation of this service reduces the delivery times from China to Colombia, Chile, Brazil, and Peru by 50% (from 20 to 10 days). Within China, Cainiao has also opened logistics centres in 20 locations to combine packages and assist local export small and medium enterprises (SMEs). Now these companies can drop off their packages at a Cainiao logistics facility, and the company delivers them to a large distribution centre.

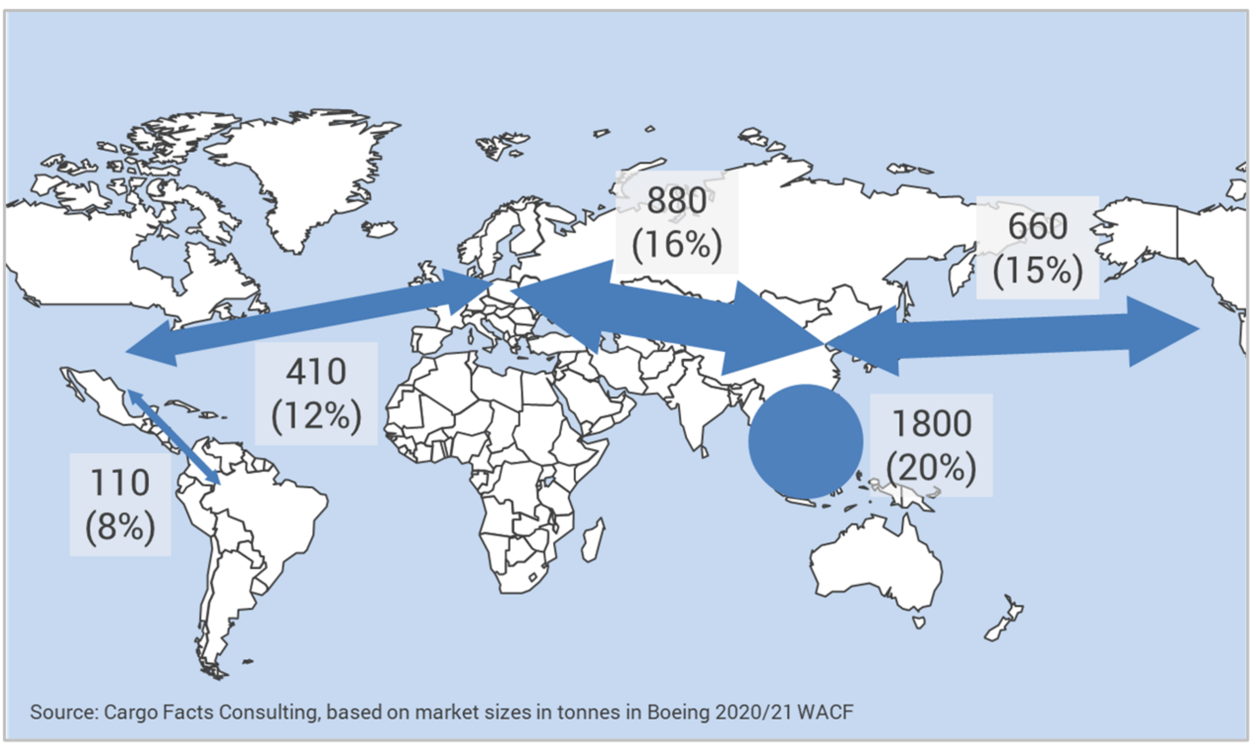
Cainiao has been ramping up its air connectivity and operations. For instance, in August Worldwide Flight Services (WFS) and Air China secured a three-year agreement for cargo and ramp handling at LGG, which will connect WFS' preexisting handling services at LGG for Cainiao. Earlier in April Cainiao launched thrice-weekly flights between Kuala Lumpur (KUL) and London (LHR), as well as five-times-weekly service connecting KUL and Hangzhou (HGH). In May Cainiao also looked to expand its air cargo operations with an air capacity agreement with Amsterdam-based GSSA Kales Group to sell capacity on China-bound flights.

JD Airlines intends to grow worldwide over the next several years after receiving an air carrier certificate from the Civil Aviation Administration of China (CAAC) in September 2022. This airline will be based in Nantong Xingdong Intl. Airport and will first grow its network around the hubs of Nantong, Beijing, Shenzen and Wuxi. The carrier is planning to reach its network to cities such as Chengdu and Chonqqing before start service to South East Asia, South Korea and Japan. By 2025, JD Airlines has plans to add destinations in North America, Europe and the Middle East. This opens an opportunity for logistics companies in China who want to use additional air capacity. We expect that JD Airlines will be facing competition from the long-established carriers YTO and SF Express.

7.3 The Invisible Traveler: E-Commerce in Scheduled Air Cargo Networks

Air freight is primarily a wholesale business that facilitates the movement of supply chain cargo and perishables. Approximately 70% of international airfreight consists of primary inputs, intermediate goods, components, parts and consumables and capital equipment. Our estimates show that about 18% of the global air cargo is e-commerce traffic moving through express, general, airfreight and postal networks. This excludes shipments into e-commerce distribution centers, which we do not view as e-commerce as its characteristics and service requirements are like cargo being transported to restock the inventories of large, fixed location retailers and wholesalers. By our estimates, some 75% of postal and over one third of international express traffic are e-commerce – this is a combined 9% of total cargo traffic. The remainder consists of e-commerce consolidations travelling under an air waybill as normal freight traffic for onward distribution in domestic or regional package delivery markets. Figure 27 provides an overview of the main regional cross border e-commerce flows based on 2021 traffic levels. While domestic networks saw a surge in air related e-commerce traffic, our estimates indicate that in 2021 the e-commerce share of air cargo traffic was much lower than 2019, due to lack of capacity and more COVID related commodities moving as air cargo and pushing out other commodities.

Figure 27 - Primary Cross Border E-Commerce Air Freight Traffic Flows, 2021



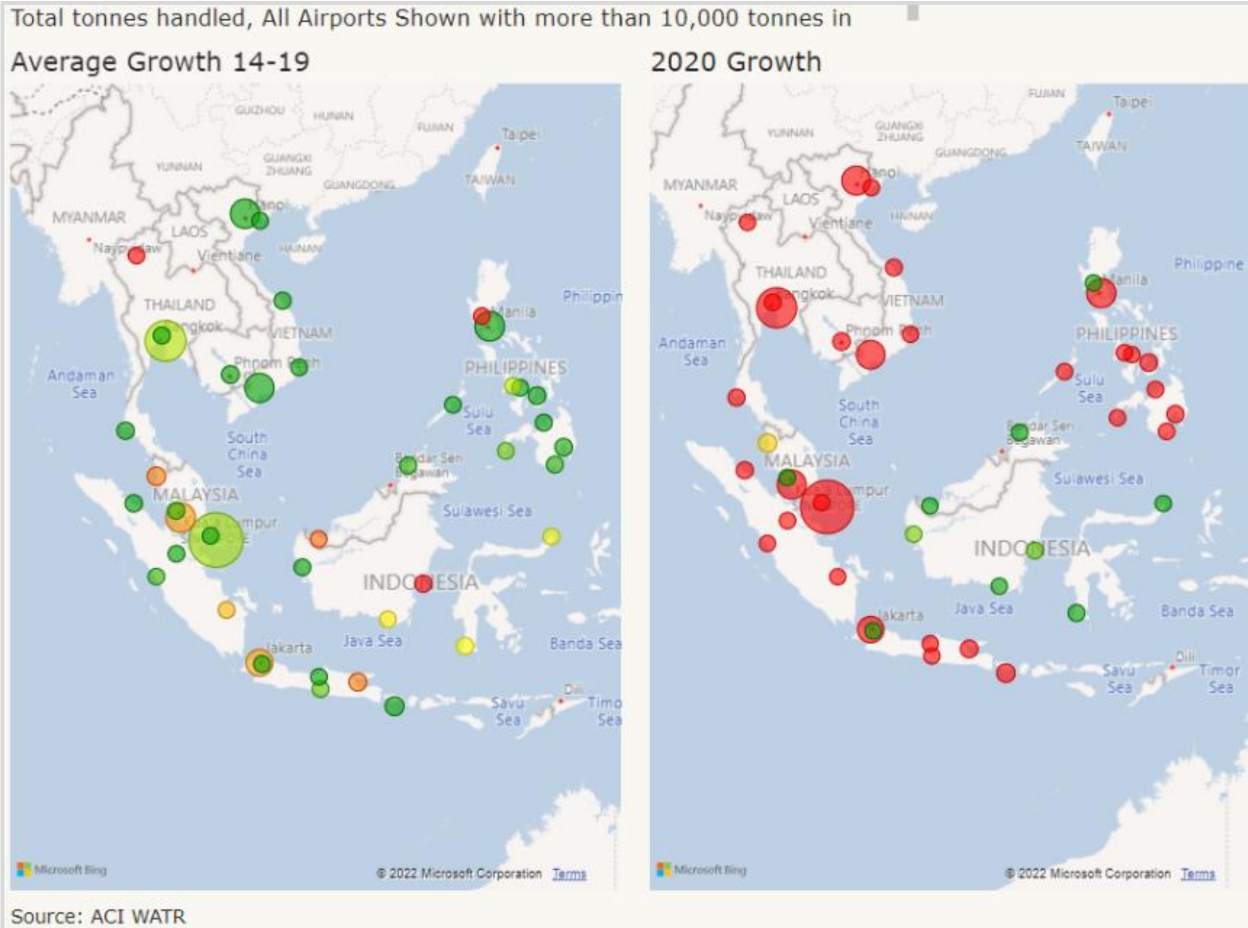
China is the largest source country for cross border e-commerce, and as such most flows are of Chinese origin, although Europe, the US, Japan, and Korea are also important source countries for intra-regional purchases or traffic to Africa and Latin America.

Airlines have been looking for ways to position themselves to achieve value from strong growth in cross border e-commerce. This requires companies to look beyond merely providing capacity to value added services including customs clearance and last mile delivery. Some examples are discussed in section 7.5.

7.4 Airports and Ground Handling

South East Asia is the fastest region in terms of e-commerce sales but has the rapid growth in e-commerce translated into volume growth across airports in Southeast Asia? Airport data actually shows that overall air cargo traffic declined in 2019 and 2020. The top four locations in the region — Singapore (SIN), Bangkok (BKK), Manila (MNL) and Kuala-Lumpur (KUL) — all exhibited above-average declines.

Figure 28 - Southeast Asia Historical Cargo Traffic (2010 – 2020)



The picture in 2021 shows that growth was strong, but volumes remain about 5% to 15% below 2019 levels.

Figure 29 – South East Asia Cargo Traffic, 2021

Total tonnes handled and Growth, Airports with more than 10,000 tonnes

Source: ACI WATR, Note data for Vietnam not available

As nations recover from the worldwide pandemic and income levels rise, we expect this regional market to expand significantly with a matching increase in demand for express logistics services fueled by a rise in e-commerce activity.

7.5 E-Commerce Solutions for Air Cargo Airlines

For air cargo, 2020 was not a typical year. While demand fell by 10.6% year over year, cargo load factors, yields, and revenues all reached new highs. Volumes have steadily increased from the low point in April of 2020, and they are expected to return to 2019 levels in March 2022 according to the latest IATA reports. This recovery is fuelled by several factors. In terms of operations, as vaccination becomes more widespread, the return of international passenger travel will relieve capacity constraints. The global economic recovery and government aid packages will provide financial support to the industry and finally, shifts in shipper behavior (such as the recent push for supply chain sustainability and reliability) will have an impact on air cargo and e-commerce strategies in the future. Moreover, new COVID-19 variants discovered in various regions of the world are pushing governments to impose new restrictions and regulations, including the reintroduction of lockdowns in numerous nations. This situation, like in 2020, will provide an additional boost to e-commerce.

Overseas Courier Service (OCS), the forwarding unit of All Nippon Airways (ANA) based in Japan has started a new service aimed at facilitating cross-border transportation of e-commerce goods and packages from Japan. The program named iEC, will start operating in Singapore, Taiwan, and South before expanding to the United States, Europe, and China later in 2022. Even though the service excludes hazardous commodities or perishables, ANA claims that OCS will be able to transport e-commerce packages using its domestic and international flight network. This partnership allows OCS and ANA to offer a comprehensive door-to-door delivery program with services such as storage, fulfillment, inventory control, customs brokerage, duty deferral, and customer-defined Incoterms through its global network of 400 stations.

In March 2021, Air Canada launched Rivo - its own e-commerce platform which allows the integration of online retailers' operations into Air Canada Cargo's network. Parcels are picked up, scanned by the Rivo system, and subsequently distributed via air to destinations throughout Canada. Rivo provides last-mile delivery by picking up packages at the airport or delivering door-to-door for intra-city goods. This service was launched in Toronto, Vancouver, Edmonton, Calgary, and Montreal and now covers 55% of the Canadian population. Air Canada shattered company records in 2021 and made significant investments that the company hopes will allow it to remain an industry leader in post-pandemic operations. As a result of the pandemic-driven increase in demand, Air Canada Cargo saw all-time high cargo revenues of $1.4 billion CAD in 2021, a 63% increase from $920 million CAD in 2020. The numbers get even more impressive if we consider that Air Canada's cargo revenues are up 195% since 2015. Air Canada has not slowed down in Q1 2022. In late January, Air Canada Cargo announced plans to further increase handling capacity at its 5,000-square-foot Frankfurt hub by an additional 35% prior to the launch of operations later in 2022. In late March, Air Canada also opened the first phase of its new $16 million environmentally friendly facility at Toronto Pearson International Airport (YYZ).

Emirates, Lufthansa or IAG (parent company of British Airways, Iberia, Aer Lingus and Vueling) are examples of other numerous airlines that have established their own e-commerce delivery networks.

Delta Airlines keeps expanding its same-day delivery service (DASH Door-to-Door) in partnership with the delivery service Roadie, which is available across most of the major metropolitan areas in the US while Singapore Airlines' KrisShop platform also launched a live inflight shopping experience where customers onboard can order products during their flight and have them delivered to their residences.

Kuehne+Nagel is eyeing further expansion its controlled freighter network following the recent launch of a weekly charter service linking Asia and Europe. In response to strong demand in the automotive and high-tech verticals, the logistics giant earlier this month began operating a direct flight between Hong Kong (HKG) and Budapest (BUD), continuing to Liege (LGG) in Belgium, using a 110-tonne capacity 747-400F. Kuehne+Nagel has not named the airline operating the aircraft on its behalf. The weekly charter offers capacity for a wide range of products, including dangerous goods and lithium batteries. Last year, they operated around 3,300 charter flights and in 2022, they are further expanding our controlled capacity network with regular Atlas B747-8F flights dedicated solely to K+N customers. E-commerce cargo has also been a key growth driver at Budapest.

8. E-Commerce in Emerging Markets: South East Asia

Key Findings:

- The pandemic led to a rapid increase of e-commerce activity in Latin America and South-East Asia, transforming these two regions into the world's fastest growing e-commerce marketplace.
- In emerging markets, e-commerce platforms are forced to partner with logistics companies that have the local knowledge, resulting in having a fragmented logistics network and not having control over the last-mile process.
- E-commerce is a key opportunity for economic development in emerging markets as it creates employment across the technology, logistics and payment service providers.
- The future success of e-commerce in Latin America and South East Asia depends on a deep understanding of shopper behaviour and innovative sales strategies with low operating cost, creating value for customers and ensuring continuous profitability for the businesses.

While much of the focus is on the three largest markets – China, the US and Europe, e-commerce share of retail in many other markets is extremely low – particularly across Africa and some regions in Asia but also across Latin America. E-commerce has arguably been a greater success story in Latin America and South-East Asia than Africa – although these markets have similar regionally focused platforms – Jumia (in Africa), Mercado Libre (in Latin America) and Lazada (in South East Asia). India is another key market that we continuously monitor. The Indian e-commerce market is expected to grow to $200 billion by 2025, up from $68 billion in 2021 while Flipkart is developing Shopsy, a social e-commerce platform that has an important customer base in New Delhi.

8.1 E-commerce development in Latin America

Retail e-commerce sales in Latin America grew 35% in 2022, reaching $157 billion and positioning the region as the second world's fastest growing e-commerce market ahead of Asia Pacific, the Middle East and Africa. Brazil, Mexico, and Argentina account for approximately 70% of all e-commerce sales in the region. Before the pandemic, e-commerce penetration was around 5% of the regional economy but it doubled by the end of 2020. However, this rate is still far below the figures in the largest digital economies such as the European Union, United States and China, where e-commerce accounts for 15% to 20% of all transactions.

Another critical trend in Latin America is the growing and developing global cross-border payment options. Local small and medium enterprises are learning to utilize new payment options to reach a broader market. In today's market, consumers expect flexibility in the method of payment and a cross-border payment experience to be secure and transparent.

While the rest of the world saw multinational e-commerce platforms experiencing rapid growth during the pandemic, several local e-commerce retailers were able to establish themselves as the leaders in the region. MercadoLibre, the largest Latin American e-commerce platform, has steadily expanded its shipping business, logistics network and digital payments solutions, and managed to double its value in 2020, and is now worth $88 billion according to the Financial Times. Other emerging platforms such as Colombia-based Rappi, Canasta Rosa in Mexico and TiendaNube in Argentina posted record sales last year, but they cannot compete yet with MercadoLibre's service offer and logistics network. Amazon, which entered the Latin American market back in 2015, has doubled its market share in the region, reaching around 5% in 2021.

Last year, CFC wondered if the pandemic would provide an opportunity for MercadoLibre to expand its operations in Latin America and position itself as a leader in the market. This year, we confirm that the e-commerce leader continues to invest in the growth of its own logistics, as evidenced by the recently launched Meli Air fleet of four aircraft. Meli Air connects the hub of Queretaro in Mexico with Cancun, Culiacan, La Paz and Merida and the hub of Sao Paulo in Brazil with Goiania and Recife in the northeastern part of Brazil. Brazil-based GOL Linhas Aereas has become the first operator of the 737-800BCF in South America and will soon begin providing air cargo service on behalf of Mercado Libre to support the Latin American e-commerce giant's growing business. Apart from the 737-800 freighters, Mercado Libre has ACMI agreements with Mexico-based Aeronaves TSM, which currently flies one DC-9-32F and two 737-400SFs, and Brazil-based Sideral, which operates two 737-400SFs. All these aircraft are also in full Mercado Libre colors.

The challenges facing the development of air cargo transport in Latin America include needed improvements in air navigation, traffic handling, airport infrastructure and connectivity. A new multilateral agreement to liberalize air cargo services in the region has resulted in the expansion of seventh freedom traffic rights without restrictions for all-cargo services on routes and capacity. The agreement is currently in place across Brazil, Chile, the Dominican Republic, Ecuador, Guatemala, Panama, Paraguay, Peru, Uruguay, and Venezuela, and will remain in effect until the end of 2021, and will likely be extended beyond that time. The seventh freedom traffic rights agreement allows for a more efficient vaccine distribution right now, and in the long-term carriers could benefit from a greater liberalization in the aviation sector and, therefore, creates potential for cross-border e-commerce growth.

Particular attention should be paid to Latin America's largest economies in the continent which are also the largest e-commerce markets: Brazil, Mexico, Argentina, Colombia and Chile.

8.2 E-commerce development in South East Asia

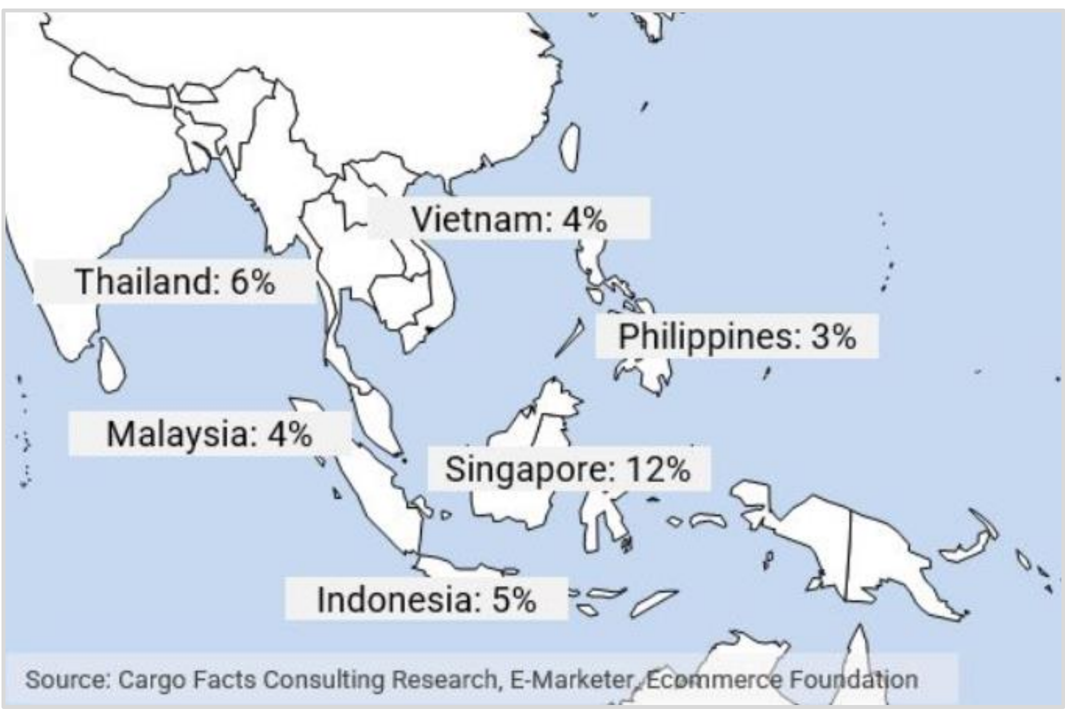
Southeast Asia is home to the world's second-fastest expanding business-to-consumer (B2C) e-commerce market after Latin America. This is the result of a variety of factors, most notably regional internet connectivity. Indonesia and the Philippines have had the fastest internet growth rate in recent years, and Malaysia is one of the top ten rising B2C e-commerce economies. Thailand and Vietnam have great development potential for mobile commerce thanks to increased smartphone adoption and mobile shopper penetration. Digital financial services have also propelled the e-commerce boom by offering several e-wallet and buy-now-pay-later options that enable a new generation of shoppers to make online purchases.

According to a recent report published by Bain Company, 40 million new internet users came online in 2021, pushing Southeast Asia's internet penetration to 75%. Eight of ten of users have made at least one online purchase, and the regional market is about 440 million internet users. This has translated into a rise in e-commerce sales, which reached $120 billion in 2021, with 45% of the region's sales coming from Indonesia. All markets have exhibited double-digit growth, with the Philippines leading the ranks.

Figures 1 and 2 display the e-commerce revenue by market and the e-commerce market penetration in 2021 across the region.

Figure 30 - Southeast Asia e-commerce revenue by market (2021)

Figure 31 - Southeast Asia e-commerce market penetration (2021)

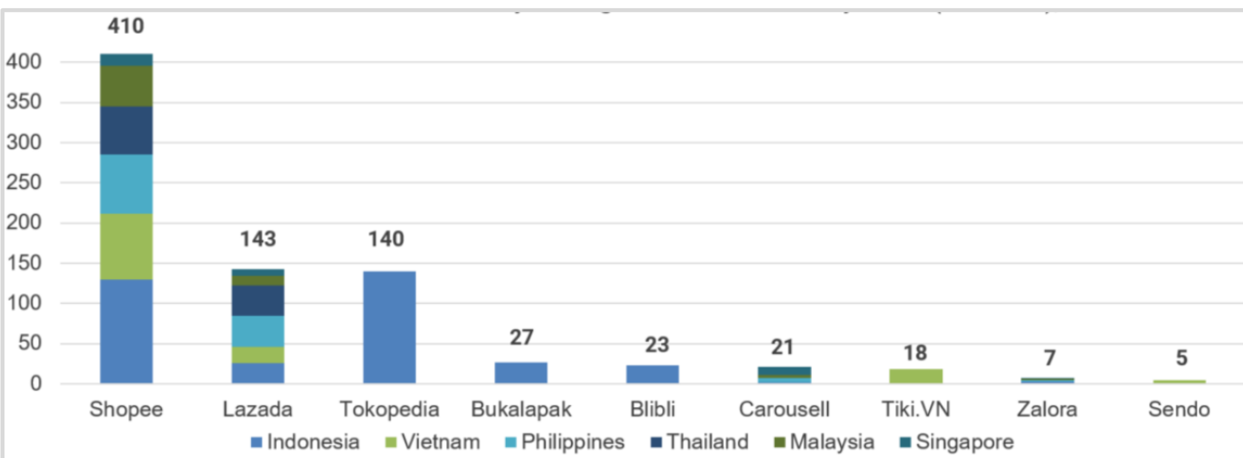


While the size of the regional market is comparable to South Korea's e-commerce market ($115 billion), it falls behind China ($2,300 billion), the U.S. ($800 billion), the EU ($500 billion), and the U.K. ($180 billion). Although B2C e-commerce in Southeast Asia is still in its early stages, cross-border sales are relatively strong, with Amazon ranking among the top online merchants, even without a local presence.

Shopee and Lazada dominate the group, thanks to successful marketing campaigns, user-friendly purchasing processes and availability in multiple languages. Shopee began as a consumer-to-consumer (C2C) marketplace and has been evolving into a hybrid model of C2C and B2C.

The two companies are trailed by Indonesia-based Tokopedia, Bukalapak and Blibli. With around 140 million monthly visits, Tokopedia reached a gross merchandise value (GMV) of $14 billion in 2021 and is building an ecosystem that spans food and grocery deliveries, digital payments, and online banking options. Social e-commerce through online applications such as Facebook, Instagram and Twitter are fueling the growth of these e-commerce marketplaces in Indonesia. Figure 32 shows the main regional online marketplaces and the number of monthly visitors to them by country.

Figure 32 - Southeast Asia's E-commerce Marketplaces by Visitor Numbers (in million), 2021



Source: TMO Group

The rise in e-commerce activity is demanding higher delivery speed and efficiency from supply chains and air freight in the near term. Examples of industry change being seen as a result include:

- DHL Express has increased its freighter capacity into the region through K-Mile Asia by upgrading its 737-400 to a 737-800 and adding more frequencies. This results in a 30% increase in weekly capacity between Hong Kong and Bangkok and between Hong Kong and Hanoi.
- Singapore Airlines is operating a 777F service connecting Singapore Changi Airport (SIN)-Seoul (ICN)-Los Angeles (LAX) in partnership with DHL Express. Singapore Airlines will operate a SIN-ICN-(LAX)-Honolulu (HNL)-SIN six times per week.
- UPS recently launched a new route five times a week from Shenzen to Bangkok that is serviced by a 747-8F.
- Air Hong Kong has increased frequencies between Beijing, Hong Kong and the Philippines, adding up to 1,200 tons of weekly capacity.
- Rimbun Air, My Indo Airlines and Raya Air have all increased frequencies to Jakarta's Soekarno-Hatta International Airport in Indonesia due to an increase in cargo demand to the region from China.
- ECS is assisting Bamboo Airways in expanding its cargo network in Singapore, Malaysia, Indonesia and the Philippines, including the deployment of a 321-passenger aircraft between Saigon and Singapore.
- DHL is working with AeroLogic and Kalitta Air to expand its air freight capacity in and out of Singapore to reduce transit times for shipments.
- ATR has identified Southeast Asia as an area of increased regional demand, where feeder freighters are best suited to meet faster deliveries.

Meanwhile, Cainiao announced the expansion of its warehousing network across Vietnam, Malaysia, Indonesia and Singapore with the expectation to provide merchants and businesses in the region an option for end-to-end cost-effective logistics services. As nations recover from the worldwide pandemic and income levels rise, we expect this regional market to expand significantly with a matching increase in demand for express logistics services fueled by a rise in e-commerce activity.

9. About Cargo Facts Consulting

Cargo Facts Consulting is a specialized air logistics advisory and research firm. Formerly also known as Air Cargo Management Group, we have been in business since 1978. We are a globally operating firm with staff based in Asia, Europe, and North America.

Our clients turn to us for deep advice, data, and insights on key aspects that effect product development, marketing, fleet planning and strategy in air logistics. These clients come from across the whole air cargo and express business and include financial institutions and investment firms, leasing companies, government, aircraft manufacturers and conversion companies, airlines, express companies, airports, and other service providers.

Our consulting experience spans projects that encompass airline network planning, fleet planning, due diligence, route development, investment assessment, air cargo and express market analysis, and aircraft technology. Our data and forecasts populate financial models related to many facets of the business, and our analysis is used in product development by a wide range of company. We also provide deep analytics for the type of data- and mission-related marketing in the aviation sector.

We strive to be the most knowledgeable and highly valued provider of strategic advice to the global air freight transportation and logistics industry. We provide actionable solutions, not just data and research based on critical needs and business objectives. We facilitate business evolution that yields greater profits and efficiency. And we do so often through long-term relationships that create a deep and more-meaningful dialogue with our customers.

Through Cargo Facts and Air Cargo World, our sister media organizations, we have a unique and high-visibility insight into industry trends and market developments as they happen.

Appendix - E-Commerce Platform Profiles

Appendix A contains logistics profiles of the top global and regional e-commerce platforms. In general, data refers to the last full financial year, but where specified has been updated to reflect most recent available quarterly filings.

Platforms have been grouped in alphabetical order for ease of reference. The platforms included in this Appendix are:

The profiles include a description of the company, information on scale (in terms of GMV), profitability and growth, geographical scope of operations, main competitors, number of active buyers and sellers, percentage of business from third party sellers, number of items and shipments, as well as key information on the logistics setup. This includes information on the type of fulfillment network, whether it is open to third parties, the cost of the fulfillment network and information on the type of dedicated air network the platform operates, if at all.

Data included in the profiles has been compiled from a range of public and semi-public sources as well as being based on our own assessment and analysis. While we have taken great care in preparing these profiles, we take no responsibility for their accuracy. We welcome your feedback and suggestions, including broadening the scope to include additional profiles

Subscribers of the report will have access to periodic updates to these profiles through the Cargo Facts Consulting Insights platform (www.cfcinsights.com) for the first six months following publication of the report.

Table 4 - Alibaba Profile

Company	Alibaba (FY Year Ended March 2022)
Description	Founded in 1999, World's largest e-commerce platform. Includes Taobao Marketplace and Tmall. AliExpress is a global marketplace for international consumers buying from Chinese manufacturers and distributors. Tmall Global allows foreign brands to access Chinese consumers. Tmall World is a platform for overseas Chinese to purchase products from China. 1688.com is a platform for wholesale commerce in China. Alibaba.com provides global and cross border wholesale services. Lazada is Alibaba's e-commerce platform across Southeast Asia (particularly Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam). In September 2019, Alibaba acquired Kaola, another Chinese cross border e-commerce platform. During FY2021, Alibaba established Community Marketplaces business to better serve consumers by leveraging next-day pick-up services and supply chain and fulfillment capabilities of Freshippo, Sun Art, Lingshoutong and other partners
Headquarters, Employees	Holding Company incorporated in the Cayman Islands, individual subsidiaries incorporated in China. Cainiao is in Hangzhou.
Gross Merchandise Value (GMV)	$1.3 trillion (of which $1b = China Retail Marketplaces). Growth of 10%.
Profitability and growth	Revenue was RMB205,555 million (US$30,689 million) and remained stable year-over-year primarily due to a decline in China commerce segment revenue by 1% year-over-year to RMB141,935 million (US$21,190 million) offset by revenue growth of Cloud segment by 10% year over- year to RMB17,685 million (US$2,640 million). Income from operations was RMB24,943 million (US$3,724 million), a decrease of 19%-year over-year. Adjusted EBITA, a non-GAAP measurement, decreased 18% year-over-year to RMB34,419 million (US$5,139 million).
Main markets	Revenue Share: China Retail (Taoboao, Tmall/ Tmall World) 64%; International Retail 7%, includes AliExpress (mainly Russia, USA, Brazil, Spain, and France), Lazada (Southeast Asia) and Tmall Global; Chinese wholesale 3% (1688.com); International wholesale 2% (Alibaba.com). IN FY19 Acquired Trendyol (Turkey) and Daraz (Pakistan, Bangladesh).
Main competitors	JD.com, Pinduoduo

Company	Alibaba (FY Year Ended March 2022)
No of active buyers/ users (m)	891 million (China), of which 811 million on Taobao and Tmall and the remainder on YouKu, Ele.me and Feshippo. 240 million international users spread across Lazada, AliExpress, Trendyol, Daraz. Buyers are located across 190 countries. Annual active consumers for the Alibaba Ecosystem reached a milestone of over 1 billion.
No of active sellers (m)	Merchants on Taobao are primarily individuals and small business By March 2021, there were over 250,000 international brands and merchants on Tmall.
% Of Business from 3rd Party Sellers	Taobao, Tmall, AliExpress and Alibaba.com are marketplaces for 3rd party sellers. However, Lazada does sell its own products.
No of items and shipments	Average cross-border package volume for March 2021 exceeded 5 million.
Own controlled fulfillment?	Cainiao Network, owned 63% by Alibaba, founded in 2013. Vision is to be able to fulfil everything within 24 hours in China and 72 hours across the world. Uses logistics partners to run this network. Uses 15 “strategic express courier partners” with 1.6m delivery personnel and 190,000 hubs and sorting locations in more than 700 cities and 31 provinces in China. Cainiao Network has partnered with over 270 logistics partners to provide fulfillment services globally. Lazada also has an inhouse logistics network. Internationally, Cainiao and the logistics Arm of Lazada support Lazada, AliExpress and Tmall World. YTO, SF, STO, Yunda, and ZTO each have a 1% stake in Cainiao. Additionally, Alibaba holds a minority stake in three of the country’s top logistics companies; ZTO Express (10%), YTO Express (11%), STO (14.60%) and Best Express (29%). These investments strengthen ties with Chinese courier service giants through cross-shareholding.
% Of volumes through own controlled logistics?	35% (estimated), compared to 32% in 2019/20
Logistics network open to 3rd parties?	Yes, supply chain and logistics services are geared to fulfillment. Also offers trade financing and customs clearance. Services are billed to merchants.
Logistics Spend	Cainiao Network achieved solid revenue growth of 68% year-over-year, to RMB37,258 million (US$5.7 billion), representing 5% of Alibaba’s total revenue. Cainiao Network also reached an important milestone of generating positive operating cash flow during fiscal year 2021.

Company	Alibaba (FY Year Ended March 2022)
Dedicated Airfreight or Aircraft Capacity	No, but Cainiao partner and shareholder YTO operates an air network of 10 aircraft.

Reflects financial data up to quarter ended in June 2022

Table 5 - Amazon Worldwide profile

Company	Amazon Worldwide (2022)
Description	2nd largest global e-commerce platform. Also offers cloud computing services thought Amazon Web Services (AWS)
Headquarters, Employees	Seattle, WA 1.3 million full and part time employees worldwide, not including independent contractors.
Gross Merchandise Value (GMV)	$600 billion
Profitability and growth	Amazon reporting revenues of $121.2 billion, up 7 percent from a year earlier Net loss was $2.0 billion in the second quarter, or $0.20 per diluted share, compared with net income of $7.8 billion.
Main markets	All segments (including Amazon Web Services, which accounts for 12% of total net revenues. United States (61%), Germany (7%), UK (6%), Japan (4%), all other markets (10%)
Main competitors	Domestic US: Target, Wal Mart International: Alibaba, regional platforms such as Flipkart, Jumia, Mercado Libre.
No of active buyers/ users (m)	Not available
No of active sellers (m)	Not available
% Of Business from 3rd Party Sellers	63% (estimated), compared to 58% in 2019 and 49% in 2014.
No of items and shipments	Not available
Own controlled fulfillment?	Yes
% Of volumes through own controlled logistics?	Amazon does not provide any visibility on percentage of shipments managed through Fulfillment by Amazon, nor the share of third party vs inhouse delivery partners. We estimate that close to 100% is fulfilled by Amazon in the US, but lower in other markets. Evidence shows an increasing share of volumes fulfilled by Amazon. Third party carriers (such as UPS) account for 50% of deliveries in the US. Own deliveries in other regions are much lower.
Logistics network open to 3rd parties?	To third party sellers.
Logistics Spend	Fulfillment costs: $58.5b (+45%) Shipping costs accounted for a further $61.1 (+61%). UPS accounted for 18% of total shipping spend, down from 23% in 2019.

Company	Amazon Worldwide (2022)
Dedicated Airfreight or Aircraft Capacity	Yes, dedicated air network capacity in North America and Europe, as well as use of integrator capacity.

Reflects financial data through to Q2 2022

Table 6 - eBay profile

Company	eBay (2022)
Description	Global commerce platform specialized in facilitating C2C and B2C sales through its website. eBay offers auction-style sales and instant shopping options for its merchandise.
Headquarters	San Jose, USA
Gross Merchandise Value – GMV	$100 billion (+11%), with 62% generated outside the US
Profitability and growth.	Revenue of $2.4 billion, down 9% on an as-reported basis and down 6% on an FX-Neutral basis Gross Merchandise Volume of $18.5 billion, down 18%. Net revenues of $2.42 billion surpassed the estimated of $2.37 billion. However, the figure decreased 9% from the year-ago quarter.
Main markets	United States (41%), Germany (14%), United Kingdom (13%), South Korea (10%), Rest of the world (22%)
Main competitors	Shopify, Alibaba, JD.com, Amazon, wish
No of active buyers/ users	185 million buyers in 2020
No of active sellers	19 million sellers with 1.6 billion live listings globally
% Of Business from 3rd Party Sellers	100%
No of items and shipments	Not available
Own controlled fulfillment?	Previously, no. Recently eBay has made moves into own controlled fulfillment but so far, they have only leased a limited number of warehouses.
% Of volumes through own controlled logistics?	Not available
Logistics network open to 3rd parties?	Yes, eBay plans to use third-party providers to offer fast delivery and logistics savings to help the site's seller compete for online consumers
Logistics Spend	Not available
Dedicated Airfreight or Aircraft Capacity	No

Reflects financial data up to latest quarter, ended in June 2021

Table 7 - Flipkart profile

Company	Flipkart (Year ended Mar 2022)
Description	Founded in 2007. 2nd largest Indian E-commerce Platform after Amazon. Walmart acquired 77% of diluted and 81% of outstanding stock of Flipkart in August 2018 for $16b. Wal Mart currently holds Flipkart through a Luxembourg based holding company FIT Holdings SARL.
Headquarters	Bengaluru, India. Holding company is incorporated in Singapore.
Gross Merchandise Value	Net revenue INR 346b (US$4.862b, +10%) Flipkart's financials have been fully consolidated under Walmart.
Profitability and growth.	Loss of approximately US$357 in 2021. In Calendar Year 2020 Wal Mart contributed an additional $1.3b to FlipKart, a substantial increase on the $140m injection in 2019, the year following the acquisition.
Main markets	India
Main competitors	Amazon. Based on reports, Amazon overtook Flipkart in size in 2016/17. Amazon losses in 18/19 and 19/20 were each over $800 million. Reliance Industries and TATA are building an all-in-one e-commerce app to compete with Flipkart and Amazon.
No of active buyers/ users	130 million
No of active sellers	Over 285,000
% Of Business from 3rd Party Sellers	Not available
No of items and shipments	500,000 deliveries per day. 180m / year.
Own controlled fulfillment?	1900 e-commerce sort centers. Supply Chain arm eKart has approximately 850 delivery hubs.
% Of volumes through own controlled logistics?	Not available. Based on warehousing costs, the majority is fulfilled by sellers themselves.
Logistics network open to 3rd parties?	To third party sellers on platform.
Logistics Spend	Not available
Dedicated Airfreight or Aircraft Capacity	No

Note: data from year ended Mar 2022

Table 8 - JD.com profile

Company	JD.com (2022)
Description	3rd largest E-commerce and retail infrastructure company, established 2004. The company has built its own nationwide fulfilment infrastructure and last-mile delivery network, staffed by its own employees, which supports both its online direct sales and its online marketplace businesses. JD.com launched its online marketplace business in 2010. NASDAQ IPO in 2014. Walmart has a 9.9% stake in the company and a non-compete agreement in China. JD.com has a controlling interest in JD Logistics, which is 19% owner by outside shareholders. In 2018 Google invested $550m in JD.
Headquarters	Incorporated in Cayman Islands, 284,000 warehouse and delivery personnel in China.
Gross Merchandise Value – GMV	$400 b (RMB 2,613 billion)
Profitability and growth.	Net revenues for the second quarter of 2022 were RMB267.6 billion (US$140.0 billion), an increase of 5.4% from the second quarter of 2021. Net service revenues for the second quarter of 2022 were RMB41.6 billion (US$6.2 billion), an increase of 21.9% from the second quarter of 2021. Cost of Revenues. Cost of revenues increased by 4.3% to RMB231.7 billion (US$34.6 billion) for the second quarter of 2022 from RMB222.1 billion for the second quarter of 2021. Income from Operations and Non-GAAP Income from Operations. Income from operations for the second quarter of 2022 was RMB3.8 billion (US$0.6 billion), compared to RMB0.3 billion for the same period last year.
Main markets	Domestic China. Immediate expansion plans are in Southeast Asia (Thailand, Indonesia, Malaysia) and will research entry into US, Europe, and Middle East. Since early 2019 offers a selection of products via Google Shopping. JD worldwide sources products from 70 countries (particularly the US, Japan, and Germany) for Chinese consumers.
Main competitors	Tmall (Alibaba)
No of active buyers/ users	Annual active customer accounts increased by 30.3% to 471.9 million in 2020 from 362.0 million in 2019.
No of active sellers	31,000 suppliers. 240,000 3rd party sellers.
% Of Business from 3rd Party Sellers	Not available
No of items and shipments	Not available but approximately 90% of the total online retail orders processed through JD Logistics' network were delivered

Company	JD.com (2022)
	on the same day or the day after the order was placed, with over 60% of the total online retail orders covered by the 211 program.
Own controlled fulfillment?	Yes, set up in 2007. Now operates through JD Logistics. Views logistics as a core capability. As of December 31, 2020, JD's warehouse network covered almost all counties and districts across China, consisting of over 900 warehouses operated by JD and over 1,400 cloud warehouses operated by third-party warehouse owner-operators under JD Logistics Open Warehouse Platform. Fulfillment Expenses. Fulfillment expenses, which primarily include procurement, warehousing, delivery, customer service and payment processing expenses, increased by 11.3% to RMB16.3 billion (US$2.4 billion) for the second quarter of 2022 from RMB14.6 billion for the second quarter of 2021. Fulfillment expenses as a percentage of net revenues was 6.1% for the second quarter of 2022, compared to 5.8% for the same period last year. The increase was primarily due to the additional cost incurred in support of the combat against the COVID-19 pandemic in Shanghai and other several regions in China.
% Of volumes through own controlled logistics?	Most orders are delivered through JD logistics network. During the second quarter, JD Logistics launched two new Asia No.1 smart industrial parks into operations in the cities of Yiwu and Wenzhou in Zhejiang Province. Together with the existing Asia No.1 smart industrial park in Hangzhou, the three smart industrial parks cover the entire Zhejiang province and drive the same or next-day delivery ratio of JD Group's online retail orders within the province to around 95%, while extending the service to the rest of Yangtze River Delta region. As of June 30, 2022, JD Logistics operated over 1,400 warehouses. Including warehouse space managed through the Open Warehouse Platform, JD Logistics's warehouse network had an aggregate gross floor area of approximately 26 million square meters
Logistics network open to 3rd parties?	Since April 2017 to businesses and in October 2018 also to consumers for intra China. Clients include Nestle, NetEase
Logistics Spend	$7.4 billion (fulfillment expenses). Fulfillment expenses as a percentage of net revenues was 6.5% for the full year of 2020, compared to 6.9% for the full year of 2019. These primarily include procurement, warehousing, delivery, customer service and payment processing expenses.

Company	JD.com (2022)
	Fulfillment expenses, which primarily include procurement, warehousing, delivery, customer service and payment processing expenses, increased by 31.7% to RMB48.7 billion (US$7.4 billion) for 2020. This increase was primarily due to the increase in shipping charges, compensation costs relating to fulfillment personnel, rental expenses for their fulfillment infrastructure and payment processing charges
Dedicated Airfreight or Aircraft Capacity	Partnership with Tianjin Cargo since November 2018. JD notes that road and High-Speed Rail in China could reduce the need for air freight in the medium term.

Reflects financial data up to quarter ended in June 2022

Table 9 - Jumia profile

Company	Jumia (2022)
Description	Largest e-commerce platform in Africa. Founded in 2012. NYSE listing in April 2019. Integrated including payment platform and logistics. IPO proceeds $252.8m, including EUR 75 million investment by Mastercard. Pernod Ricard invested EUR 75m prior to IPO. Its logistics service enables the shipment and delivery of packages from sellers to consumers, and the company's payment service facilitates transactions among participants active on its platform in selected markets.
Headquarters	Headquarters in Berlin, management center in Dubai, operations center in Porto
Gross Merchandise Value – GMV	GMV reached $271.1 million, up 21% on a year-over-year basis and 34% on a constant currency basis.
Profitability and growth.	Revenue reached $57.3 million in the second quarter of 2022, up 42% on a year-over-year basis and 56% on a constant currency basis. This increase was driven by the strong growth in First Party revenue, which accelerated by 92% in the second quarter of 2022, on a year-over-year basis, supported by the strong momentum in the FMCG and grocery sub-category in particular.
Main markets	Operates across six regions and 11 countries in Africa. Local sites: Algeria, Egypt, Ghana, Ivory Coast, Kenya, Morocco, Nigeria, Senegal, South Africa, Tunisia, Uganda and. Its geographical segments are West Africa, North Africa, South Africa, East Africa, Portugal, France, and Germany. The firm generates most of its revenue from the West Africa segment
Main competitors	Varies by market. Souq.com (Egypt), Konga (Nigeria), Takealot, Superbalist (South Africa), Global E-commerce companies such as Alibaba and Ebay.
No of active buyers/ users, millions	Active consumers: 6.8m (+12%).
No of active sellers	110,000 in 2020. Majority of sellers are local but allows Chinese sellers access to platform. 1-4% of sellers are key accounts (major distributors), most are local professional traders, shop owners, manufacturers, and individuals. A small percentage of sellers are Chinese cross border sellers experienced in customs formalities.
% Of Business from 3rd Party Sellers	95% (compared to 93% in 2019).
No of items and shipments	Orders increased from 26.5 million in 2019 to 27.9 million 2020. Jumia Express product accounts for 30% of all items. Jumia Express involves storage in own warehouses and faster dispatch.

Company	Jumia (2022)
Own controlled fulfillment?	Yes, through Jumia Logistics. Uses over 300 logistics partners across Africa. 1,100 pick-up stations for consumers. Proprietary delivery fleet for express in select areas. Also operates fulfillment centers. Freight & Shipping initiatives: The broader roll-out of next-day free shipping is driving robust volume growth, allowing them to negotiate volume rebates with our third-party logistics partners in the relevant areas.
% Of volumes through own controlled logistics?	90%
Logistics network open to 3rd parties?	In the future, yes.
Logistics Spend	Fulfillment expense: $82.3 m ($92 m in 2019). No guidance is provided regarding the shipping share of fulfillment expenses. Fulfillment expense increase was due to a higher proportion of cross-border packages from overseas sellers and a higher proportion of packages delivered outside primary cities.
Dedicated Airfreight or Aircraft Capacity	For cross border inbound freight, but Jumia does not provide commentary.

Reflects financial data up to quarter ended in June 2022

Table 10 - Mercado Libre profile

Company	MercadoLibre (2022)
Description	Largest e-commerce platform in Latin America. Founded in 1999. Integrated including marketplace, payment, logistics, classified, advertising, and web shop solution. NASDAQ IPO in 2007. MercadoLibre's commerce segment (64% of revenue in 2020 includes online marketplaces in more than a dozen Latin American countries, display and paid search advertising capabilities (MercadoClics), online store management services (MercadoShops), and third-party logistics solutions (MercadoEnvios).
Headquarters, Employees	Buenos Aires, data centers in Virginia, USA. 15,546 (+23%) employees mainly in Argentina and Brazil.
Gross Merchandise Value (GMV), millions	\$20.9b (+50%)
Profitability and growth	Net revenues grew 73% in 2020 to \$3.9 billion; the increase was mainly attributed to an increase in gross merchandise volume and sales of goods. Net income of \$81.3 million after two consecutive years of losses. 1H 2021: net revenues of \$3.1 billion (up 132% y-o-y). Net income of \$104.9 m (reported loss of \$34 m during Q1 2021). MercadoLibre has not shown strong signs of profitability over the past few years and as of today, it has negative equity on its balance sheet. The next few years will be key to whether liabilities carried forward cancel out in the future.
Main markets	Brazil (55%), Argentina (25%), Mexico (15%). The company derives about 95% of its revenue from Brazil, Argentina, and Mexico.
Main competitors	B2W, Magazine Luiza, Amazon (in Mexico since 2015 and more recently, in Brazil)
No of active buyers/ users (m)	Buyers: 44.2 (+18%)/ Users: 132.5 (+74%).
No of active sellers (m)	13.5 (+17%)
% Of Business from 3rd Party Sellers	100%
No of items and shipments	Items sold: 719.3m (+89%)
Own controlled fulfillment?	MercadoEnvios warehousing and fulfillment. Shipping service through integration with local carriers and own transportation services. Service available in six countries (Argentina, Brazil, Mexico, Colombia, Chile, and Uruguay). Not available in Peru, Venezuela, Ecuador, Costa Rica, Dominican Republic, Panamá, Bolivia, Guatemala, Paraguay, Nicaragua, Honduras and El Salvador.

Company	MercadoLibre (2022)
	MercadoLibre relies on several local carriers to receive the inventories of third parties and ship orders to customers. Fulfillment centers in Axotlan and Tepozotlan, Mexico State, Mexico; Louveira and Cajamar, Sao Paulo State, Brazil; Buenos Aires, Argentina; Cross docking facilities in Cambinas and Villa Guilherme, Sao Paulo State; Sarandi and Mercado Central, Buenos Aires. Share of m2: Brazil (63%), Argentina (10%), Mexico (21%), Others (6%).
% Of volumes through own controlled logistics?	83% 2020, 80% in 2019. It used to be 66.1% in 2018; 56% in 2017 and 48% in 2016.
Logistics network open to 3rd parties?	No, but intends to maximize the utilization of MercadoEnvios
Logistics Spend	Unclear, but pay local carriers for shipping costs and then decide how much to pass onto their customers. Since 2017, the company has been subsidizing shipping to provide free shipping to its customers. In 2019 free shipping applied to 62% of volume purchased and 50% of units delivered. Shipping subsidy: $262.1m in 2019 (compared to $424.8m in 2018 and $181.6 in 2017). As of end of 2020, free shipping is offered to buyers in Brazil, Argentina, Mexico, Chile, and Colombia. Shipping subsidies decreased by 38.5% and the company implemented a flat fee charged to customers for transactions below a certain merchandise value by $90.8m. Most of the flat free is generated in Brazil. Company does not state whether this covers shipping costs so effective subsidy may be higher.
Dedicated Airfreight or Aircraft Capacity	In 2020, MercadoLibre launched Meli Air with a fleet of dedicated aircraft covering routes across Brazil and Mexico, with the intent of improving delivery times.

Reflects financial data up to quarter ended June 30, 2022

Table 11 - Pinduoduo profile

Company	Pinduoduo (2020)
Description	Founded in 2015, Pinduoduo is now the largest online marketplace for agricultural products in China. The company went public on Nasdaq in 2018. Pinduoduo integrates with social platforms such as Weixin or QQ to
Headquarters	Shanghai, China
Gross Merchandise Value – GMV	$42 b.
Profitability and growth.	In the three months to June 30, it reported net income attributable of 2.41 billion yuan ($372 million) compared with a net loss of 899.3 million yuan a year ago and revenue of 23.05 billion yuan ($3.56 b)
Main markets	China
Main competitors	Alibaba, JD.com
No of active buyers/ users	258 million active buyers and 879 million annual active users in 2021, surpassing Alibaba
No of active sellers	Not available
% Of Business from 3rd Party Sellers	Not available
No of items and shipments, in millions	40.7 billion orders in 2021
Own controlled fulfillment?	No. Upon an individual purchase on the platform, the merchant handles the fulfillment, selects the most suitable third-party logistics service provider, and arranges for the delivery of products to the buyers.
% Of volumes through own controlled logistics?	Not available
Logistics network open to 3rd parties?	Not applicable
Logistics Spend	Not available
Dedicated Airfreight or Aircraft Capacity	No

Table 12 - Rakuten profile

Company	Rakuten (2022)
Description	E-commerce and Internet company established in 1997. It's a B2B2C e-commerce platform with base in Japan which offers e-commerce solutions internationally. The internet services segment comprises businesses running various e-commerce sites, including Rakuten Ichiba, an internet shopping mall; travel booking sites; portal sites; and e-book businesses as well as businesses for advertising.
Headquarters	Tokyo, Japan
Gross Merchandise Value – GMV	\$49 billion (+35%)
Profitability and growth.	The Rakuten Group recorded revenue growth in all three segments in Q2 FY2022: Internet Services, FinTech and Mobile. Consolidated revenue achieved double-digit growth, up 13.5% year-on-year (YoY), coming to a total of 456.5 billion yen (3.326M \$). In addition to the growth in domestic e-commerce transaction value due to both sustained user retention since the impact over two years ago of COVID-driven stay-at-home consumption and the recovery in domestic travel demand, the customer base expansion in Rakuten's fintech services also contributed to the revenue increase. In Q2 FY2022, the average number of monthly active users across the Rakuten Group in Japan surpassed 37 million, up 11.3% YoY. Cross-use also expanded steadily (74.7%) and the Rakuten Ecosystem's customer base continues to grow. the Rakuten Group recorded Non-GAAP operating losses of 79.1 billion yen in Q2 FY2022 (575M \$)
Main markets	Japan, Korea. Also active in Europe and the US (through Webgistix)
Main competitors	Amazon, Walmart, JD.com
No of active buyers/ users	123 million
No of active sellers	46,000 active sellers
% Of Business from 3rd Party Sellers	Not available
No of items and shipments, in millions	Not available
Own controlled fulfillment?	Yes, Rakuten Super Logistics (RSL) is a leading ecommerce order fulfillment company that provides the scalability, flexibility, and cost savings retailer's demand. RSL allows Rakuten to have a global fulfillment network that provides online retailers and consumers

	with fast and efficient distribution solutions for cross-border e-commerce.
% Of volumes through own controlled logistics?	Not available
Logistics network open to 3rd parties?	Yes
Logistics Spend	Not available
Dedicated Airfreight or Aircraft Capacity	No

Reflects financial data up to latest quarter ended on June 30, 2022

Table 13 - Shopify profile

Company	Shopify (2022)
Description	Leading cloud-based, multi-channel e-commerce platform. Shopify builds web and mobile based software and lets merchants set up online storefronts, enabling them to manage product inventory, process orders and payments, ship orders, build customer relationships, source products, leverage analytics and reporting.
Headquarters	Ottawa, Canada
Gross Merchandise Value – GMV	120 billion, GMV up 96% from 2019 Second-Quarter GMV Growth ($42.2 billion) of 40% Year on Year
Profitability and growth.	Net loss for the second quarter of 2022 was $1.2 billion, compared with net income of $0.9 billion for the second quarter of 2021. At June 30, 2022, Shopify had $6.95 billion in cash, cash equivalents and marketable securities, compared with $7.77 billion at December 31, 2021. In 2020, Shopify expanded their multichannel offering to help merchants reach more buyers. This included Pinterest, Instagram, Facebook, TikTok and Walmart.
Main markets	Canada, United States, United Kingdom, Australia
Main competitors	eBay, Amazon
No of active buyers/ users	578 million shoppers in 2022, a 35% increase vs. 2020
No of active sellers	1,749,000 merchants from 175 countries use Shopify, geographically dispersed: United States (50%), UK (8%), Canada (6%), Australia (6%), Latin America (4%) and rest of the world (29%)
% Of Business from 3rd Party Sellers	100%
No of items and shipments, in millions	Not available but in 2020, Shopify processed an average of 121 million orders per month or 4 million orders daily.
Own controlled fulfillment?	Shopify was not responsible for the fulfilment. However, in June 2019, they announced the launch of Shopify's Fulfillment Network and acquired a warehouse automation company (6 River Systems) in late 2019. This fulfillment network has been growing and Shopify now has fulfillment centers in California, Georgia, New Jersey, Nevada, Ohio, Pennsylvania, and Texas. Shopify is aiming to support up to 30,000 packages per day.
% Of volumes through own controlled logistics?	Not applicable

Company	Shopify (2022)
Logistics network open to 3rd parties?	Not applicable
Logistics Spend	Not applicable
Dedicated Airfreight or Aircraft Capacity	No

Reflects financial data up to latest fiscal quarter ended June 30, 2022

Table 14 - Target Profile

Company	Target (2022)
Description	US based omnichannel retailer, founded in 1902. The company sells its products through its stores; and digital channels, including Target.com. The company operated approximately 1,897 stores. Total of 409,000 employees in the US. Target.com owns and oversees the company's e-commerce initiatives.
Headquarters	Minneapolis, USA.
Gross Merchandise Value – GMV	$9 billion (+19%)
Profitability and growth.	$93.56 billion of revenue in 2021 (+19%) Net income of $4.369 billion in 2021 (+33%). Q2 2022: total revenue of $25.2 billion grew 9.5 percent compared with last year
Main markets	United States exclusively
Main competitors	Walmart, Amazon
No of active buyers/ users	265 million visits in December 2021. Guests receive a 5 percent discount on nearly all purchases and receive free shipping at Target.com when they use their Target Debit/ Credit card.
No of active sellers	Exclusively own retail.
% Of Business from 3rd Party Sellers	No third-party sales
No of items and shipments, in millions	Not available
Own controlled fulfillment?	46 owned distribution centers and 20 office locations globally.
% Of volumes through own controlled logistics?	Not applicable
Logistics network open to 3rd parties?	Not applicable
Logistics Spend	Not applicable
Dedicated Airfreight or Aircraft Capacity	No

Reflects financial data up to latest fiscal quarter ended June 2022

Table 15 - Walmart Profile

Company	Walmart (Year ended Jan 2022)
Description	US based omnichannel retailer, 11,500 physical stores. E-commerce websites under 54 banners in 26 countries. Incorporated in 1969. First foray into e-commerce in 2000 with Walmart.com. Acquired Flipkart (India) in 2018 and entered minority shareholding of JD.com in 2016. Walmart International segment conducts business in 25 countries as of September 2022. Walmart is the largest private employer in the world with 2.2 million employees.
Headquarters	Bentonville, AK. 2.2m employees, of which 0.8 m outside the US
Gross Merchandise Value – GMV	GMV for Walmart is estimated to be $64.9 (+63%), of which $43b is generated in the US, $5.3b as part of Sam's Club (which is present in the US, Mexico, Brazil, and China), and $16.6b in international markets.
Profitability and growth.	Total revenue was $152.9 billion, up 8.4%, or 9.1% in constant currency Second-quarter highlights Company delivered strong top-line growth globally, partially driven by inflation. Walmart U.S. comp sales1 grew 6.5% and 11.7% on a two-year stack. eCommerce growth was 12% and 18% on a two-year stack. Continued to gain market share in grocery. Walmart International net sales were $24.4 billion, an increase of $1.3 billion, or 5.7%, negatively affected by $1.0 billion from currency fluctuations. Double-digit comps in three largest markets of Mexico, Canada, and China. Consolidated operating income was $6.9 billion
Main markets (2019)	US (67% of net sales) and International (22% of net sales) with operations in Africa, Argentina, Canada, Central America, Chile, China, India, Japan, Mexico, and the United Kingdom, as well as Brazil Main e-commerce markets in US, Mexico, UK, Canada, and India. 40 dedicated eCommerce fulfillment centres in the US and 88 internationally.
Main competitors	Target, Amazon
No of active buyers/ users	295 million customers
No of active sellers	Exclusively own retail
% Of Business from 3rd Party Sellers	No third-party sales

Company	Walmart (Year ended Jan 2022)
No of items and shipments, in millions	Not available
Own controlled fulfillment?	83 dedicated e-commerce fulfillment centers and 2,500 e-commerce sort centers in India Walmart has approximately 7,300 pickup and 5,200 physical stores.
% Of volumes through own controlled logistics?	US: 80% of store merchandise shipped through 162 distribution facilities, the remainder directly from suppliers International: 85% of Walmart International volumes through own distribution facilities. There is a total of 221 distribution facilities outside the US in Canada, Central America, Chile, China, India, Mexico, South Africa, Japan, and the United Kingdom.
Logistics network open to 3rd parties?	No
Logistics Spend	Unclear. Free two-day shipping on over 2 million items launched 2017. FedEx is the delivery partner for this. In Jan.2020, Walmart launched NextDay Delivery to more than 75 percent of the U.S. population, launched Delivery Unlimited from 1,600 locations in the U.S. and expanded Same Day Pickup to nearly 3,200 locations. In early 2021, Walmart+ was launched. This new membership offers unlimited free shipping and delivery from store with no order minimum.
Dedicated Airfreight or Aircraft Capacity	No

Reflects financial data up to latest fiscal quarter ended July 2022

Table 16 - Wish Profile

Company	Wish (2022)
Description	E-commerce platform founded in 2010. One of the most popular platforms for cross border e-commerce, accounting for about 10% of all cross-border transactions. In 2015, both Amazon and Alibaba offered to purchase Wish for $10 billion. Wish is publicly traded on Nasdaq now (WISH) and its market capital is $1 billion. Wish went public in December 2020 at $24/share. The stock initially slid below its IPO price and now it's about $7/share.
Headquarters	San Francisco, USA
Gross Merchandise Value – GMV	Not available.
Profitability and growth.	Revenues: Revenues were $134 million, a decrease of 80% YoY Core Marketplace revenues were $54 million, down 86% YoY Product Boost revenues were $11 million, down 78% YoY Logistics revenues were $69 million, down 70% YoY Net Loss: Net Loss was $90 million, a 19% YoY improvement. Net Loss per share was $0.13, compared to a loss of $0.18 per share in the second quarter of fiscal 2021 Adjusted EBITDA: Adjusted EBITDA was a loss of $58 million, an improvement of 13% YoY
Main markets	Globally but with a focus in China, Europe, and North America. The US accounts for 25% of its online visits per month.
Main competitors	Alibaba/ AliExpress, MercadoLibre, Amazon, EBay
No of active buyers/ users	110 million monthly active users (12% growth in FY2021).
No of active sellers	Over 500,000 merchants but almost the majority (95%) are in China. Most of Wish's merchants are in China, exposing the company to challenges regarding custom fees, tariffs, and trade war headwinds.
% Of Business from 3rd Party Sellers	100%
No of items and shipments, in millions	Over 150 million of items available for sale and over 2 million products sold per day. Shipment number not available.
Own controlled fulfillment?	No
% Of volumes through own controlled logistics?	None
Logistics network open to 3rd parties?	Wish logistics offering for merchants is designed for direct end-to-end single order shipment from a merchant's location to the user.

Company	Wish (2022)
	Logistics services include transportation and delivery of the merchant’s products to the user. Merchants are required to prepay for logistics services on a per order basis.
Logistics Spend	Not applicable
Dedicated Airfreight or Aircraft Capacity	No

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