Facts and Future of Cross-border Parcel Flows:
First Results of Antwerp University & UPU Research

University of Antwerp
Faculty of Business and Economics

UPU UNIVERSAL POSTAL UNION

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Agenda

1 État des lieux of the postal industry

2 The industry architecture of the cross-border parcel market

État des lieux of the postal and parcel industry

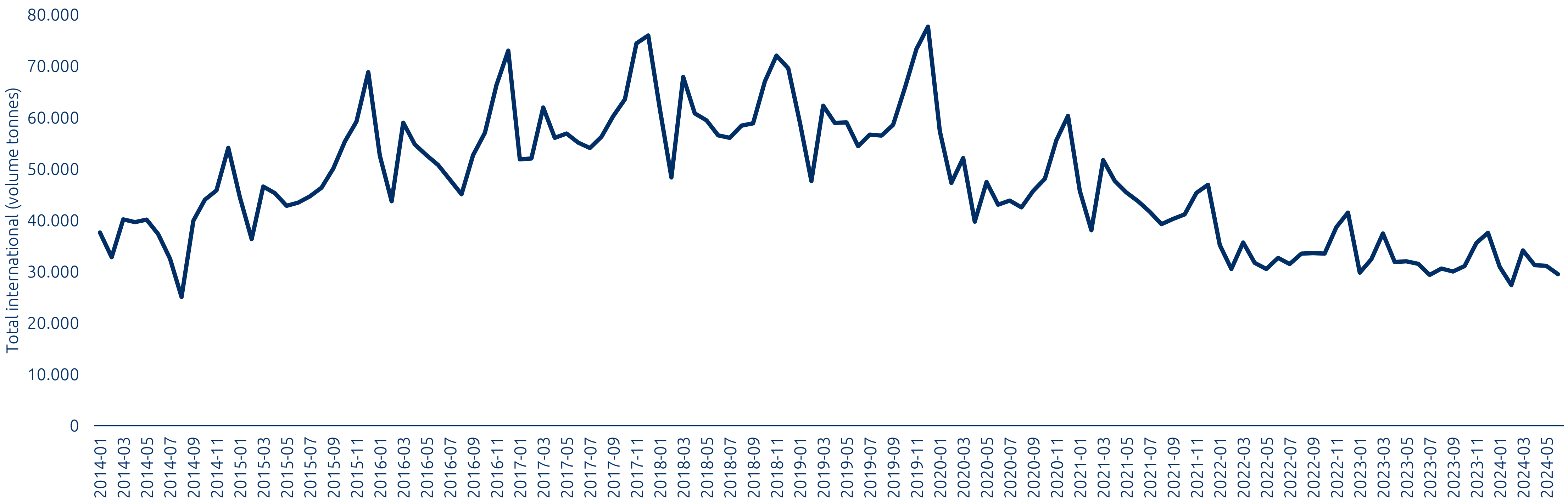
1.1 **Postal flow statistics**

1.2 Postal quality statistics

Postal flow statistics

Total international postal decline

Total international postal volumes (EMS, parcels, and letter post) in tonnes, measured monthly from 2014 to mid-2024.



International postal volumes have shifted from **pre-COVID growth to a post-COVID decline.** While holiday peaks remain consistent, the overall continuation of the **downward trend** is clearly visible.

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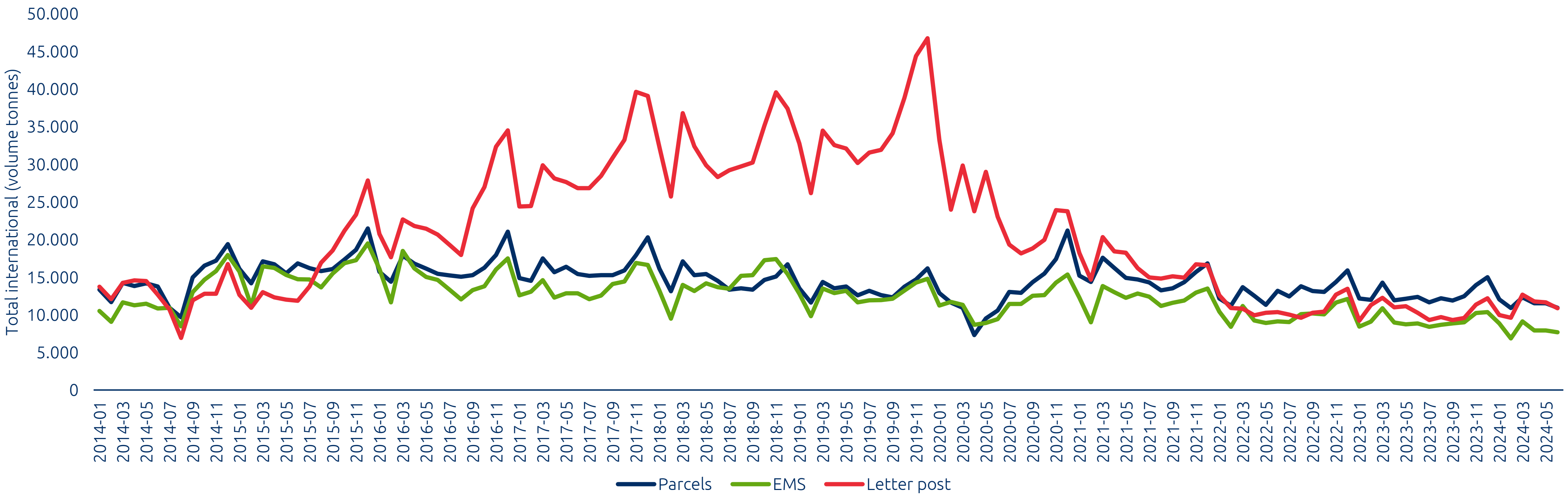
Source: Own composition based on OD International Postal Volumes (2013-2024).
July 2016 has been estimated (average of June and August 2016)

Total international postal decline

International postal item volumes are decreasing for EMS, parcels and letter post

Split between the three categories of international postal volumes measured monthly in tonnes from 2014 to mid-2024.

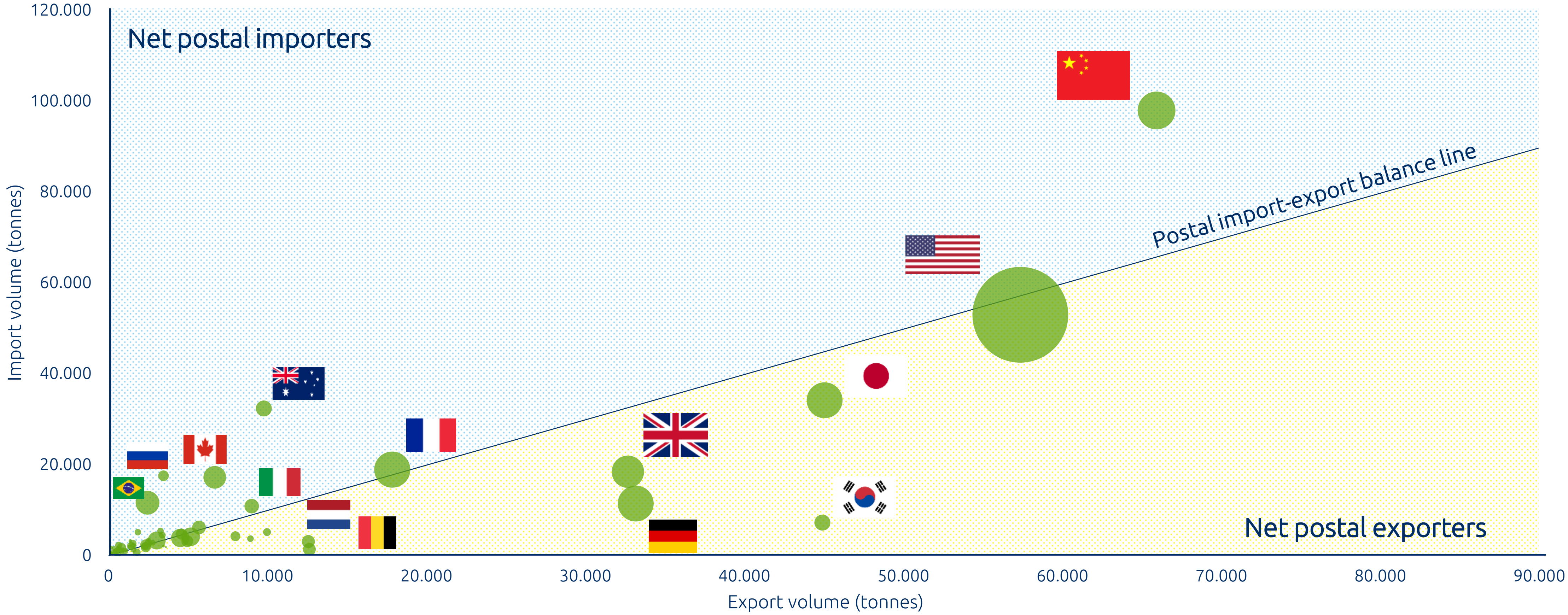


All **three international postal** categories are **experiencing a decline**, with **letter post** showing the **sharpest drop**. This trend is driven by changes in **remuneration** (terminal dues) **policies,** the **impacts of COVID-19**, and **digitalisation**, while **EMS and parcels** are comparatively **more stable.**

Source: Own composition based on OD International Postal Volumes (2013-2024).
July 2016 has been estimated (average of June and August 2016)

Postal importers and exporters: 2014 snapshot

2014 snapshot of global postal trade, showing countries' import and export volumes (in tonnes). The dot sizes are the number of domestic postal items in 2014. The diagonal line separates net postal importers (blue) and exporters (yellow).

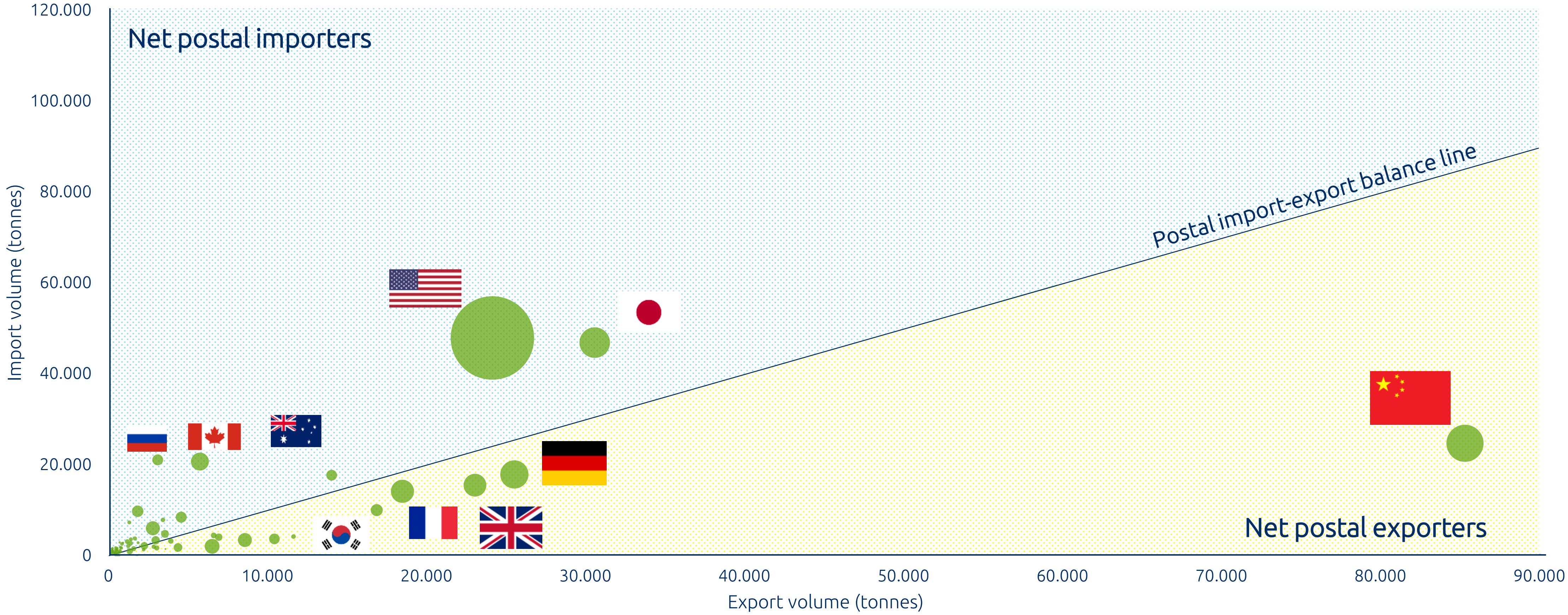


Source: Own composition based on OD International Postal Volumes (2013-2024) and UPU Official Postal Statistics Database (1980-2022)

Postal importers and exporters: 2023 snapshot

In 2023, compared to 2014, the clustering at the beginning of the import-export balance line is less clustered

2023 snapshot of global postal trade, showing countries' import and export volumes (in tonnes). The dot sizes are the number of domestic postal items in 2022. The diagonal line separates net postal importers (blue) and exporters (yellow).

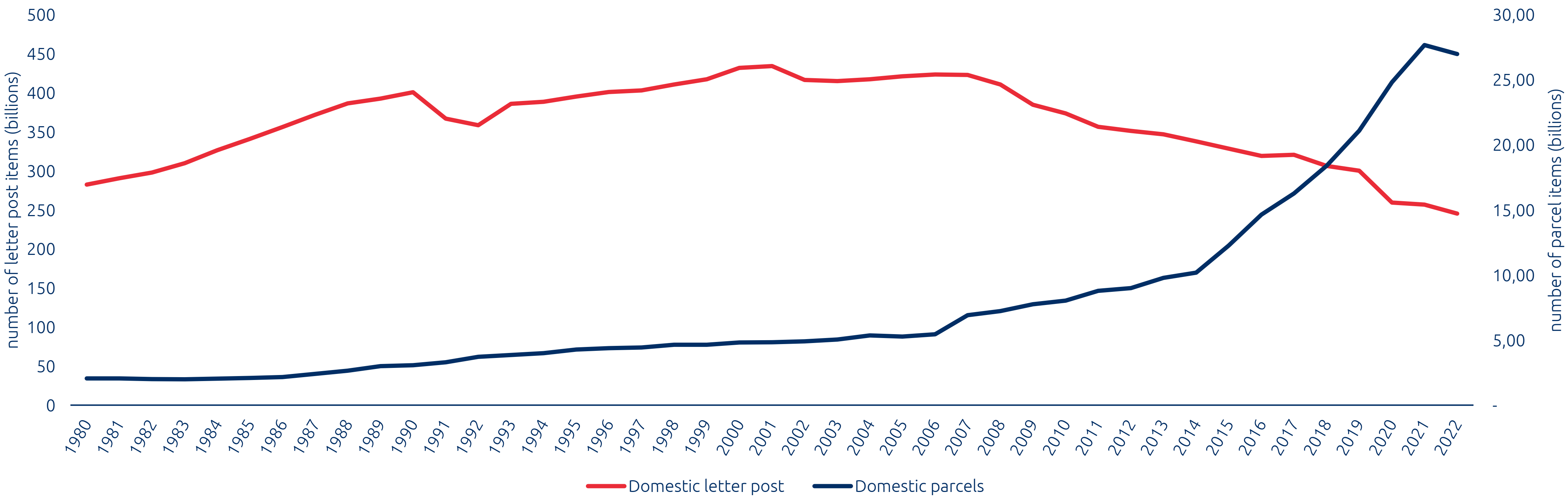


Source: Own composition based on OD International Postal Volumes (2013-2024) and UPU Official Postal Statistics Database (1980-2022)

Domestic letter and parcel post comparison

A strong decline in domestic letter-post volumes while parcel-post volumes increase

Evolution of domestic letter post and domestic parcel numbers, measured annually from 1980 to 2022.



Domestic letter post volumes have steadily d**eclined since the late 1990s**, while **domestic parcel volumes have surged** since 2015. This divergence highlights the **shifting postal and parcel landscape** towards **more parcel shipments**, also for postal operators.

Source: Own composition based on UPU Official Postal Statistics Database (1980-2022)

État des lieux of the postal and parcel industry

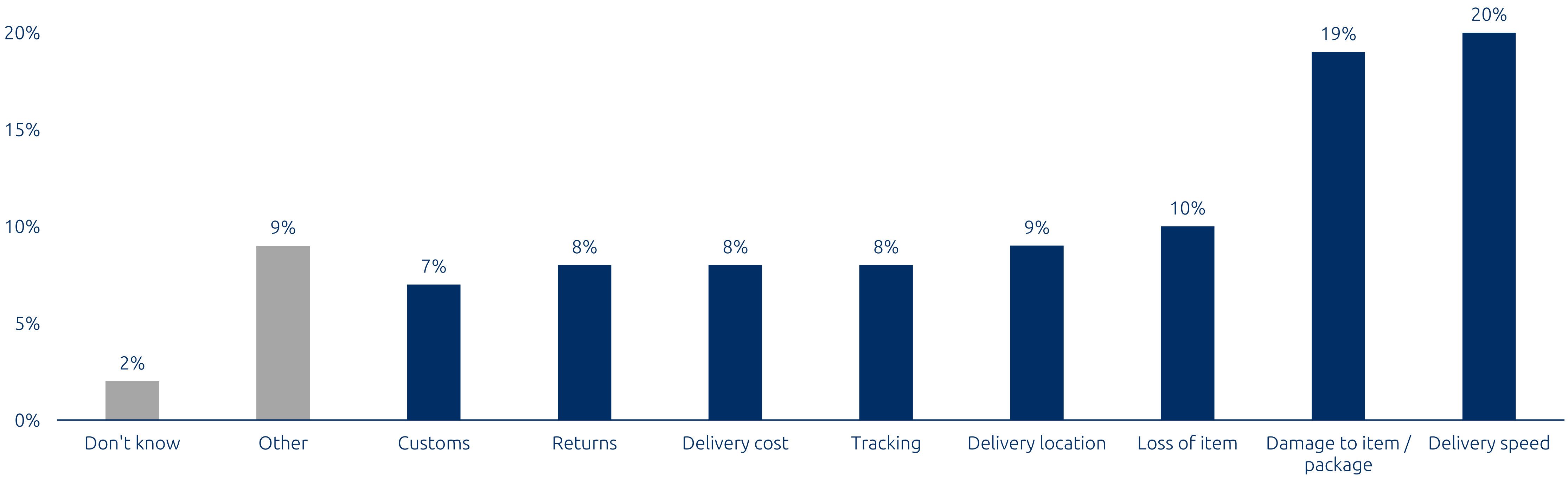
1.1 Postal flow statistics

1.2 Postal quality statistics

Customers' concerns about deliveries

Speed and safety dominate regarding last-mile delivery concerns

Top customer concerns in delivery services, based on the IPC 2023 survey.



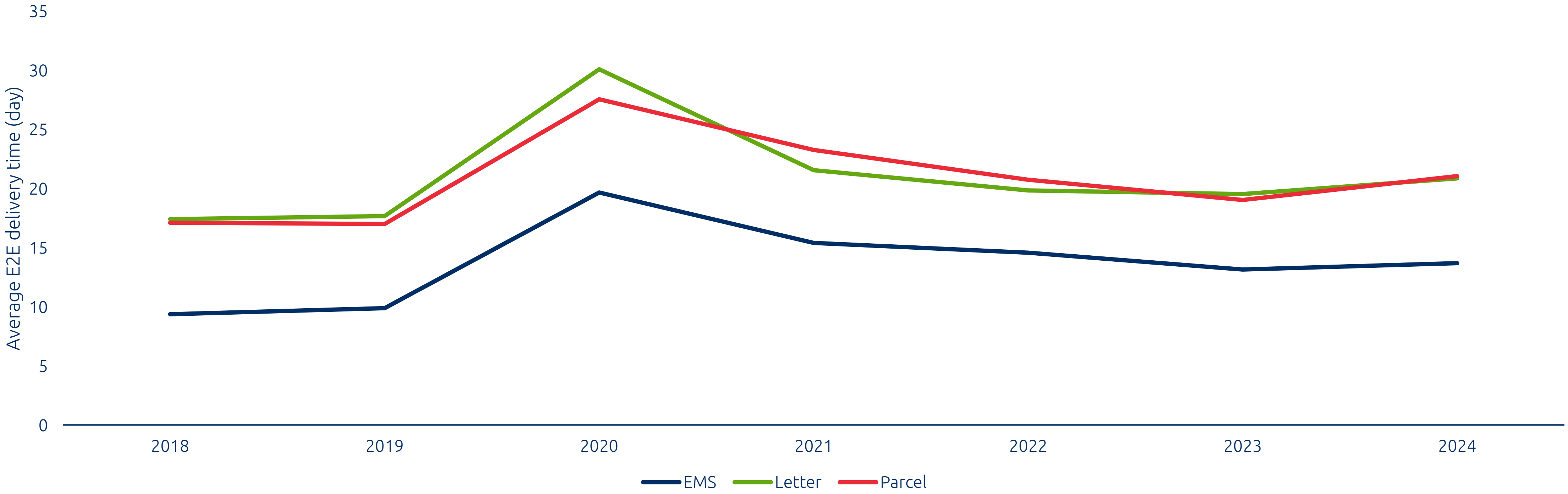
Delivery speed, item damage, and loss of items are the top customer concerns, representing **nearly 50% of all customer concerns**.

Source: Own composition based on IPC cross-border e-commerce shopper survey (2023)

Postal operators’ end-to-end (E2E) delivery times per category

Relatively slow postal E2E delivery times with EMS as the fastest postal option

Average end-to-end delivery times for EMS, letter post, and parcel post from 2018 to 2023.



EMS has the **fastest average delivery time** among postal item categories. Although delivery times **have improved since the peak** delays in 2020, **post-COVID-19 averages remain higher than pre-COVID-19 levels**.

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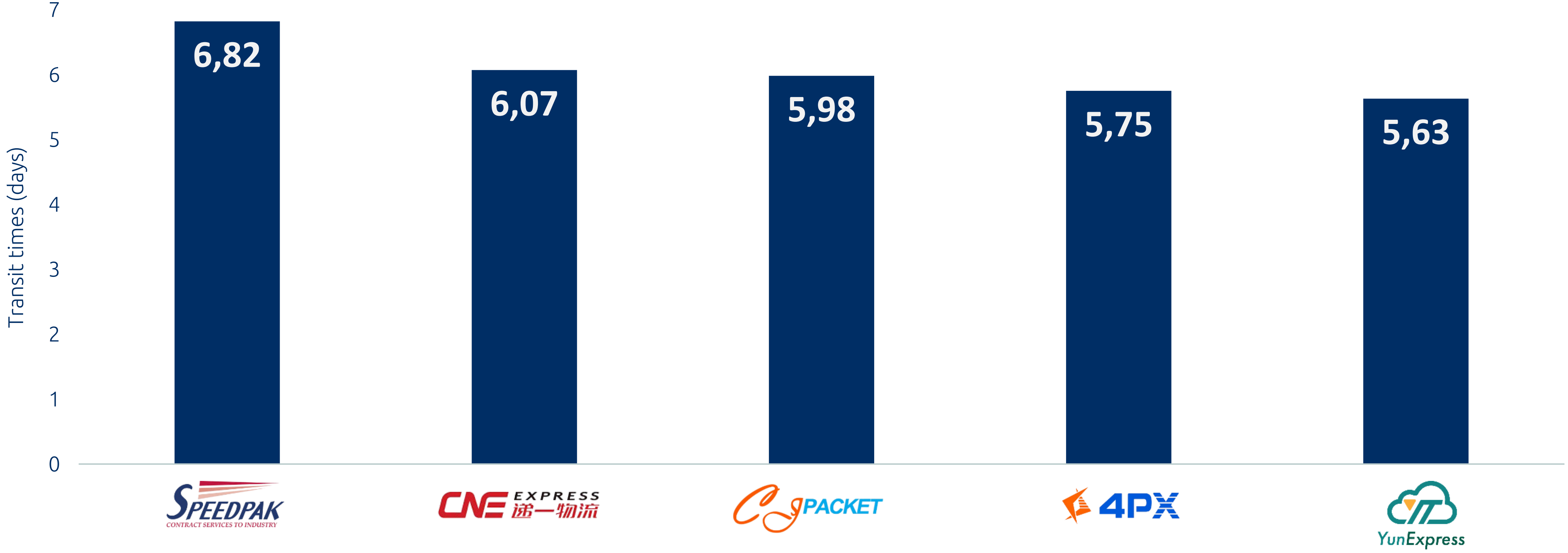
Source: Own composition based on OD Delivery Performance (2018-2024)

Faster alternatives on key routes: China-USA

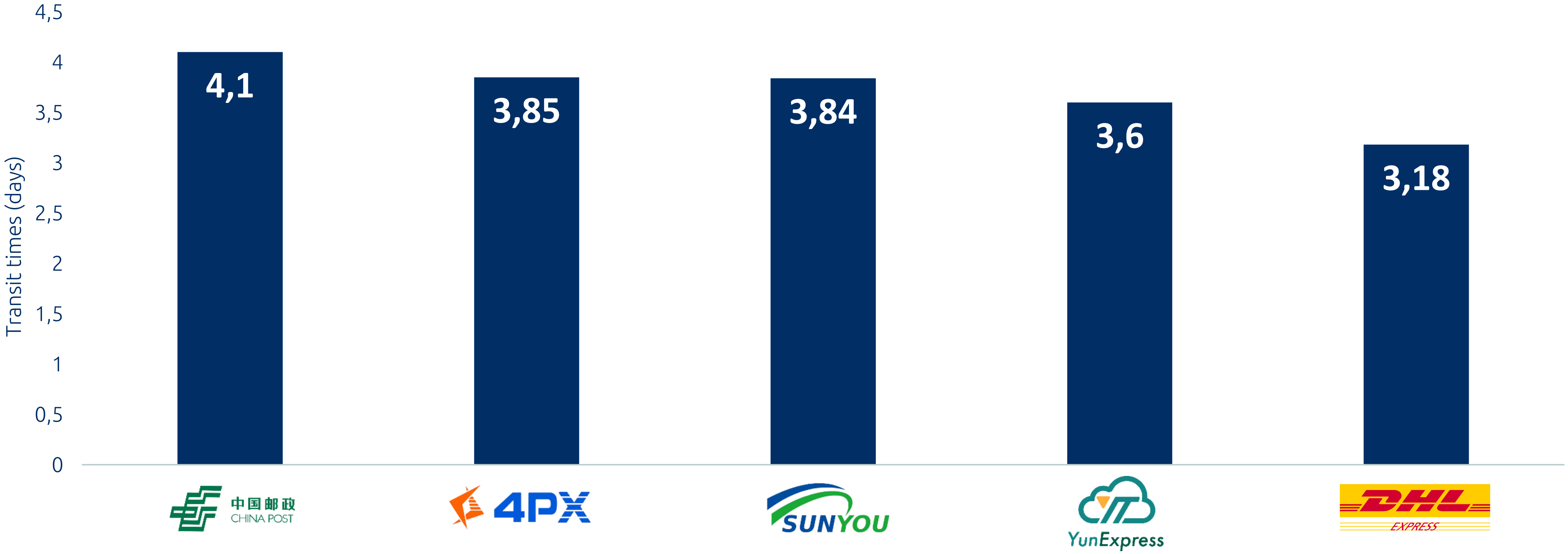
Top 5 parcel carriers are shown on the China-USA route in Q3 2024 based on transit times. None of the top carriers are postal operators; instead, the route is dominated by Asian non-postal players, offering delivery speeds of around six days.



Source: Own composition based on Parcel Monitor (2024)

Faster alternatives on key routes: China-Japan

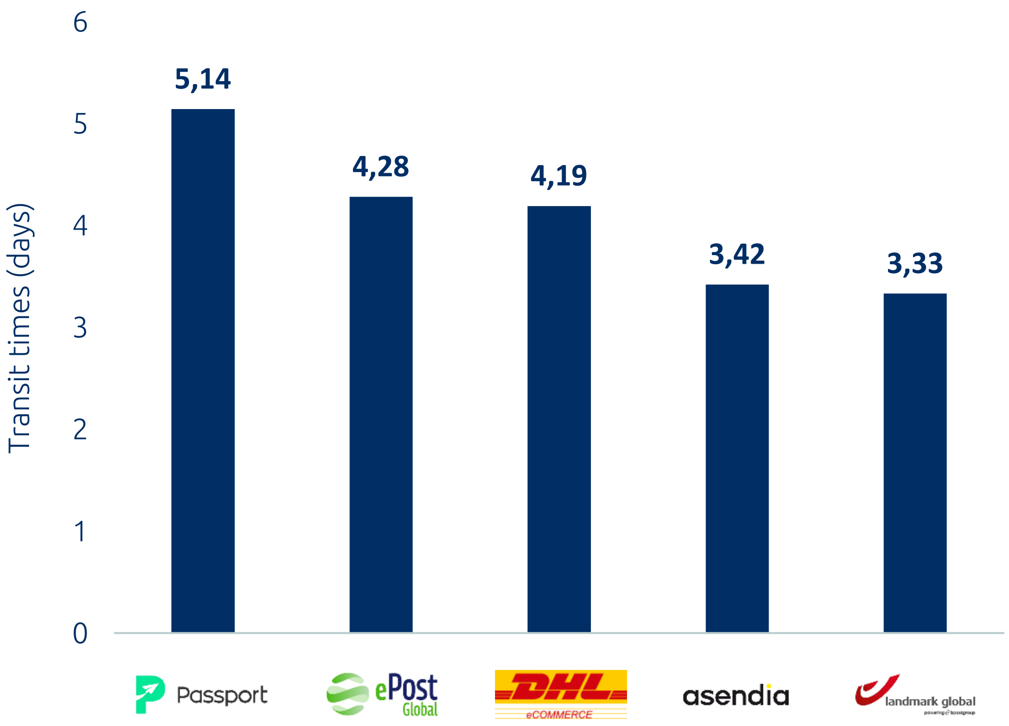
Top 5 parcel carriers are shown on the China-Japan route in Q3 2024 based on transit times. The route is dominated by non-postal players, with China Post being the only postal operator in the top 5, ranking fifth with a transit time of 4.1 days.

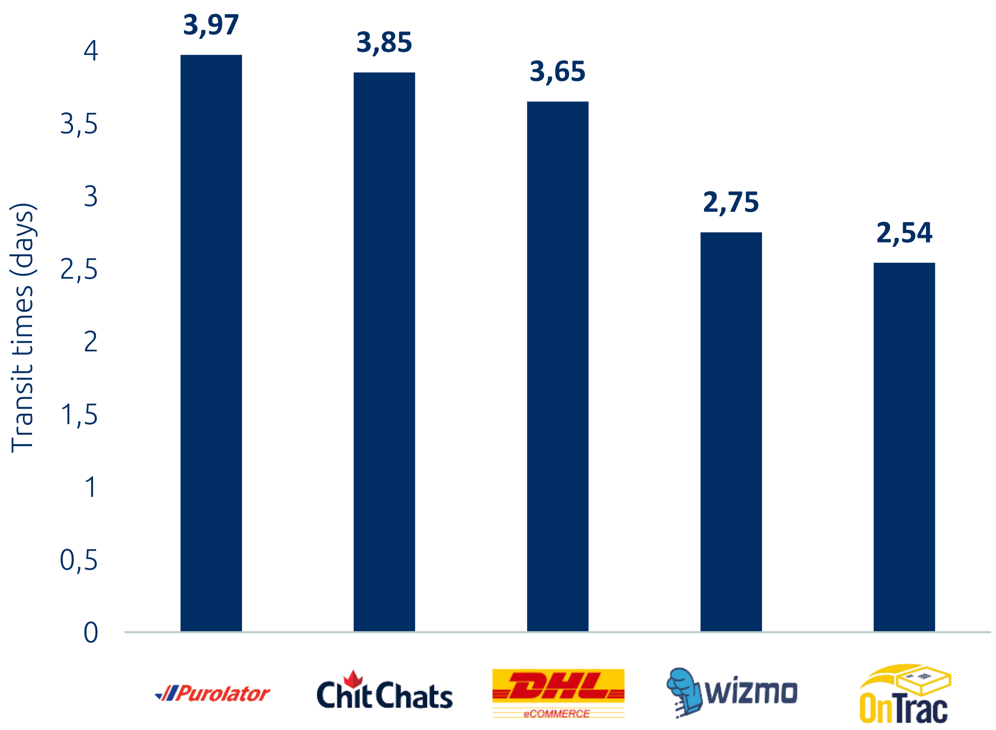


Source: Own composition based on Parcel Monitor (2024)

Faster alternatives on key routes: Canada-USA (left) and USA-Canada (right)

Top 5 parcel carriers are shown on the Canada-USA and USA-Canada routes in Q3 2024 based on transit times. On the US-CA route (left), subsidiaries of postal operators dominate, while on the CA-US route (right), non-postal players lead with faster delivery speeds.

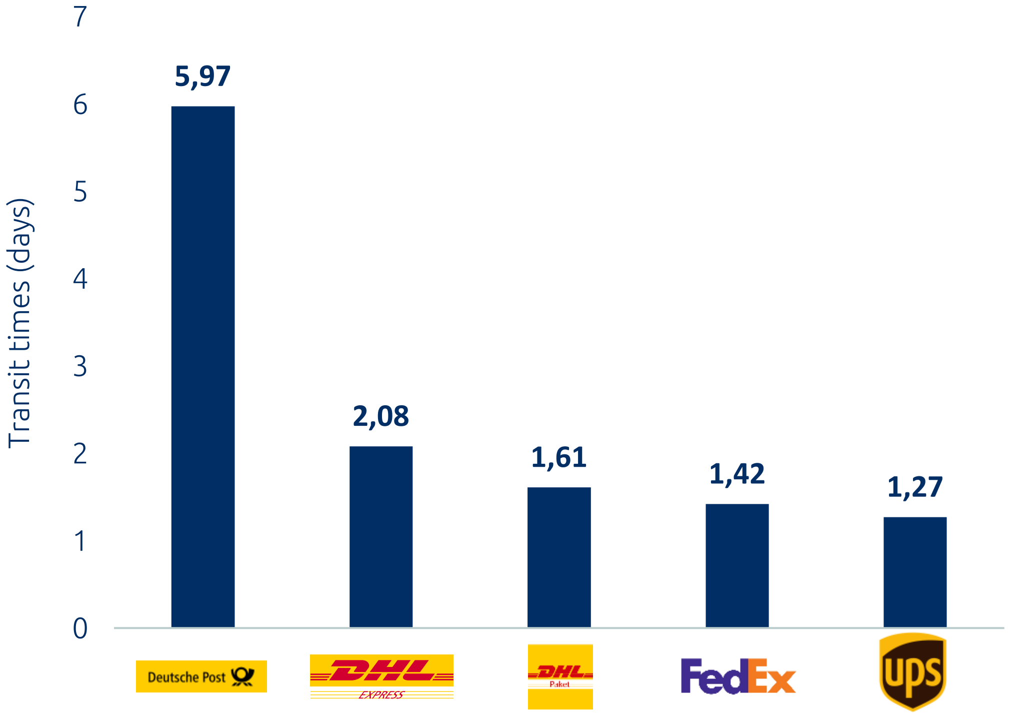


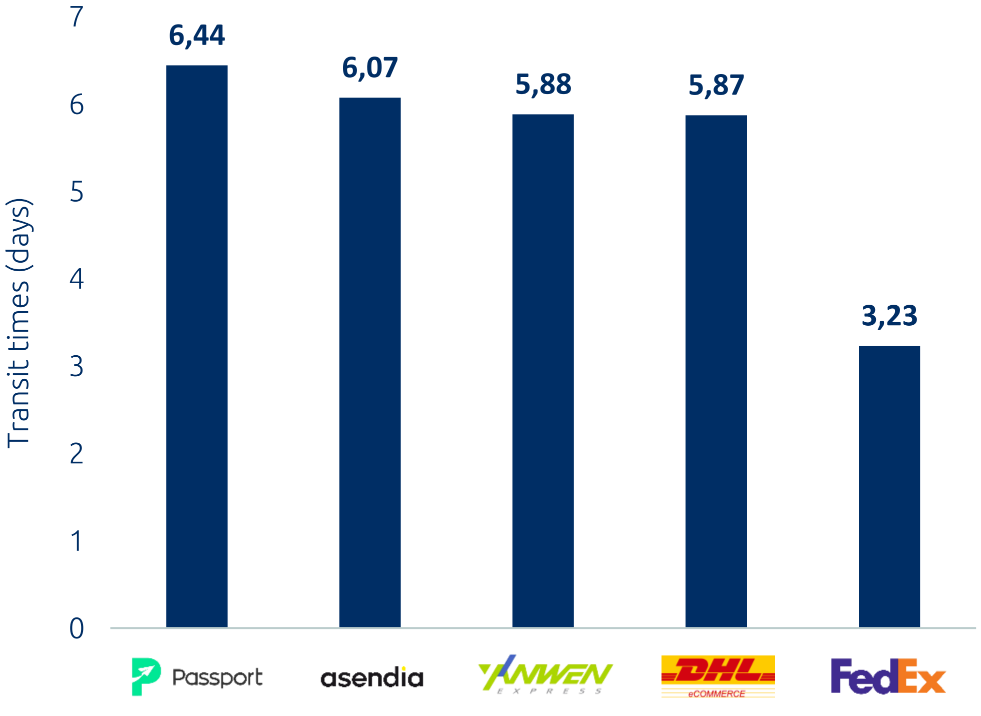


Source: Own composition based on Parcel Monitor (2024)

Faster alternatives on key routes: Germany-USA (left) and USA-Germany (right)

Top 5 parcel carriers are shown on the Germany-USA and USA-Germany routes in Q3 2024 based on transit times. On the DE-US route (left), non-postal players dominate, with Deutsche Post ranking fifth. Non-postal players lead in delivery speed on the US-DE route (right).





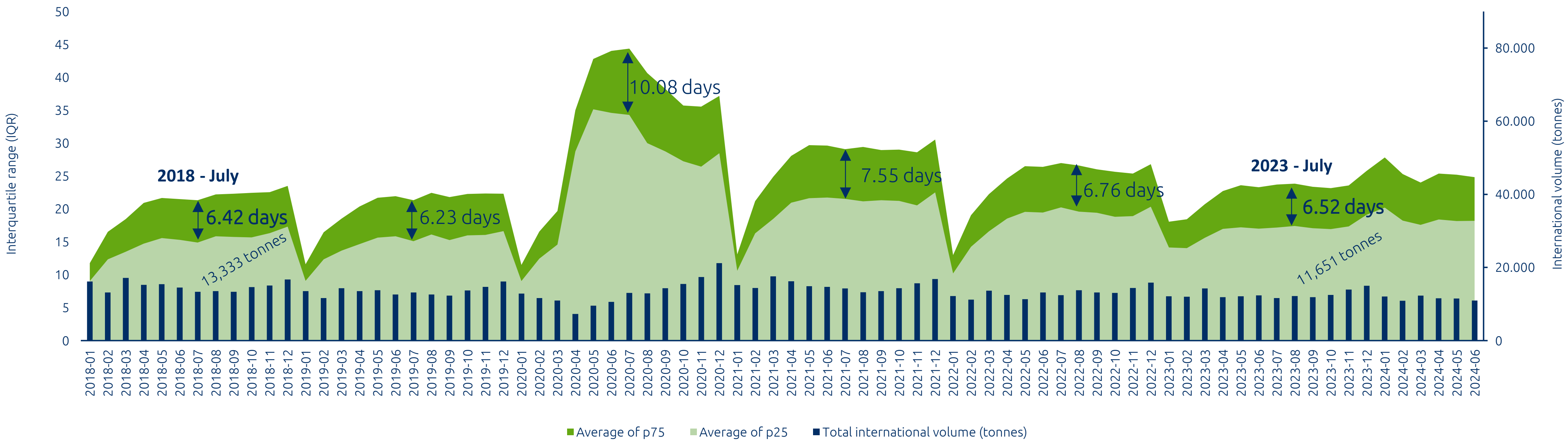
Source: Own composition based on Parcel Monitor (2024)

Postal quality statistics

Postal delivery (un)reliability: parcel post

Less reliable with less volumes

Variability in end-to-end parcel post delivery times, measured by the interquartile range (IQR), alongside total international postal volumes from 2018 to mid-2024.



The **variability of post-COVID-19 is higher than pre-COVID-19 levels**, while the **international postal volumes decreased**.

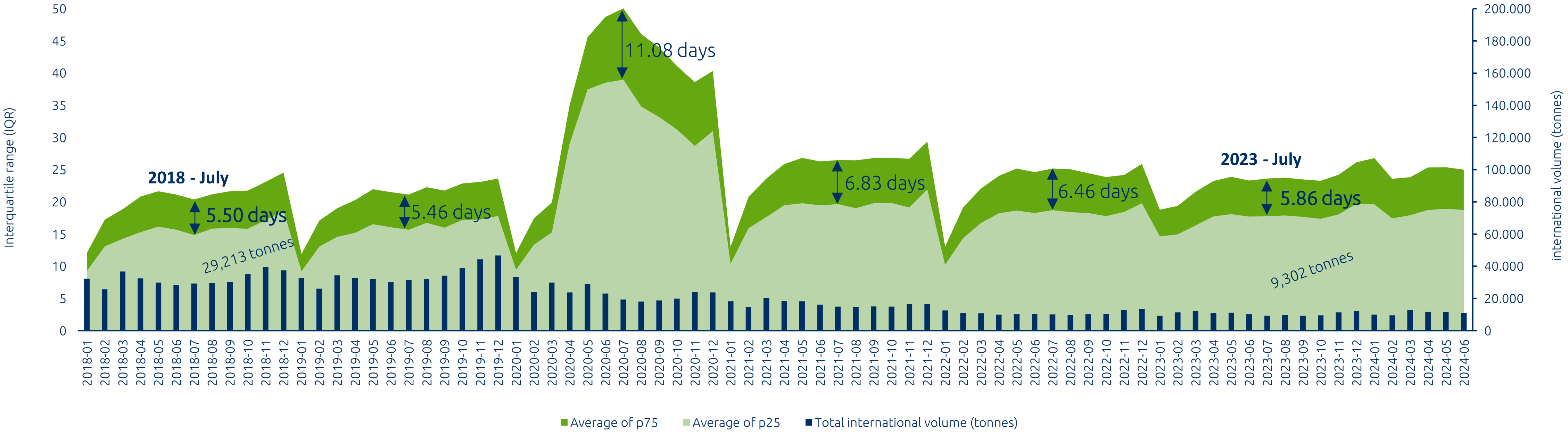
Source: Own composition based on OD Delivery Performance (2018-2024) and OD International Postal Volumes (2013-2024)

Postal quality statistics

Postal delivery (un)reliability: letter post

Less reliable with less volumes

Variability in end-to-end letter post delivery times, measured by the interquartile range (IQR), alongside total international postal volumes from 2018 to mid-2024.



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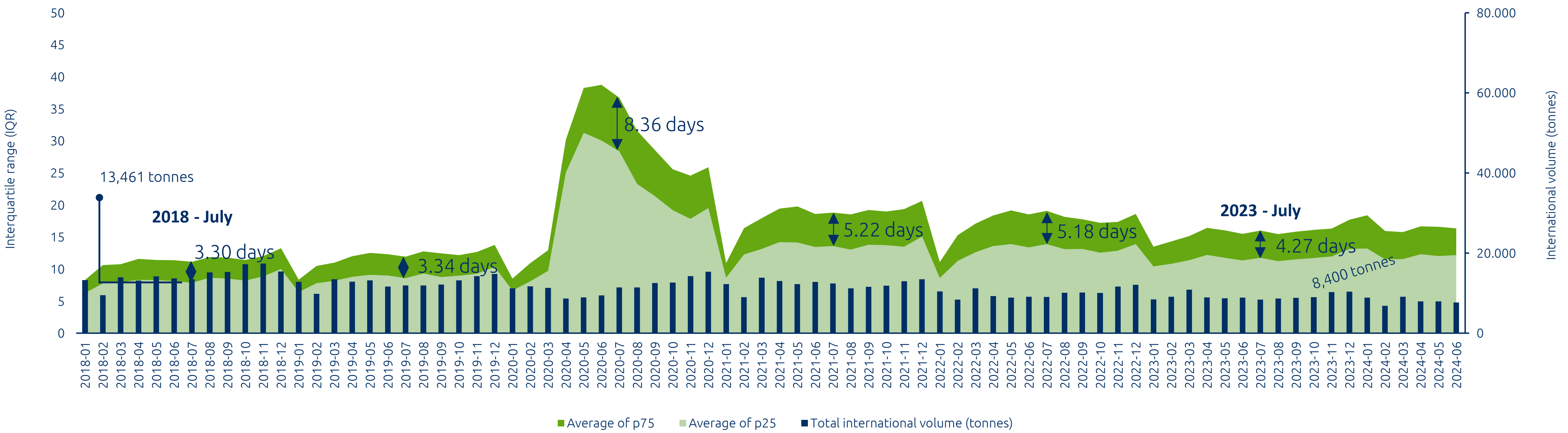
Source: Own composition based on OD Delivery Performance (2018-2024) and OD International Postal Volumes (2013-2024)

Postal delivery (un)reliability: EMS

Less reliable with less volumes

Variability in end-to-end EMS delivery times, measured by the interquartile range (IQR), alongside total international postal volumes from 2018 to mid-2024.



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Source: Own composition based on OD Delivery Performance (2018-2024) and OD International Postal Volumes (2013-2024)

Agenda

1 État des lieux of the postal industry

2 The industry architecture of the cross-border parcel market

The industry architecture of the cross-border parcel market

Understanding industry architecture (IA): the blueprint of sector dynamics

1. Conceptual **sector-wide structural** configuration, 'template', or framework originated from **strategic management and industrial organisation.**
   - Helps to understand the **structure** and **dynamics of industries**
   - Establishes the **'rules of the game'** for **value creation** and **capture** (who gets what) within an industry
     - Focuses on the **relationships** and **roles** of different players within the industry
     - Defines the **division of labour** (who does what) among firms
     - IA is **not static**, as power dynamics evolve with **new challengers and external factors**

2. **Power dynamics** describe how firms **establish and sustain influence** by controlling key interfaces and resources.
   - Rooted in **strategic industry roles** which allow firms to impose constraints and steer industry evolution to their advantage
   - Organisations that can effectively **navigate and influence their IA** can achieve an **'architectural advantage'**

Source: Own composition based on Adner (2017), Baldwin (2014), Ferraro & Gurses (2009), Jacobides et al. (2006), and Jacobides & Tae (2015)

The industry architecture of the cross-border parcel market

2.1 Academic background

2.2 **Methodology**

2.3 Rules of the game

2.4 Historical milestones affecting the landscape

2.5 Industry architectural role evolution

Methodological framework of the study

Data gathering	Internal UPU databases	External sources (e.g., IPC and World Bank)	
Methods	Industry and academic literature review	Data visualisation methods	Semi-structured interviews
Results	Rules of the game, IA visual, and IA role evolution	Graphs and data-related insights	Actor insights used throughout the entire study

The industry architecture of the cross-border parcel market

Understanding the rules of the game (“Principles”) in industry architecture

Rules of the game

- Who creates and captures value **(who gets what)**
- How roles and responsibilities are distributed **(who does what)**
- How **industries evolve** to accommodate new challenges and opportunities

1. The **"rules of the game"** refer to the **structural, institutional, and dynamic norms** that govern how firms **interact, compete, create, and capture value** in a given industry or ecosystem
2. The "rules of the game" **are not static** because they are **shaped by a dynamic interplay of external forces**, **internal strategies, and evolving interdependencies** within industries and ecosystems

Source: Own composition based on Jacobides et al. (2006)

The industry architecture of the cross-border parcel market

Key historical milestones shaping the global postal and parcel landscape (1/2)

27-14 BC
First well-documented postal service

1874
Formation of the Universal Postal Union (UPU)
Unifying global postal flows with standardised tariffs and protocols

1906
Expansion of UPU mandates to include international parcels
Parcels remained a niche market compared to letters

1920s–1930s
Airlines began carrying international mail, cutting delivery times significantly

1940-1945
World War || disrupts all kinds of logistics, including postal logistics

1970s
Growth of private courier companies like DHL, UPS, and FedEx

1970s-1990s
Declining letter volumes due to telecommunication growth and globalisation of trade

1991
The emergence of the World Wide Web, enabling early e-commerce companies to be founded

Source: Own composition based on Berners-Lee (1992), conducted interviews, FedEx (2024b), Reilly (2016), USPS (n.d.), and Universal Postal Union (n.d.b)

Key historical milestones shaping the global postal and parcel landscape (2/2)

1997-1999
Establishment of the UPU's Express Mail Service (EMS)

2000s
The explosion of e-commerce drives parcel volumes.
Global expansion of e-commerce platforms like eBay and Amazon

2010
Introduction of smartphone apps revolutionises parcel tracking and customer interaction

2010s
Cross-border e-commerce volumes surge
Rise of ecosystems like Alibaba and Amazon

2018–2021
Terminal dues framework changes

Countries were allowed to set their own rates for inbound small parcels

2020s
Platforms like Vinted, Temu, and Shein challenge global giants
Further acceleration from international to domestic postal flows

2021
Introduction of stricter customs requirements for Postal Operators (EDA)

2024
European Union is investigating the level playing field between European and outside-European e-commerce players

2025
Change in the American de minimis regulation and taxation of specific countries

Source: Own composition based on conducted interviews, OECD (2002), Tamma & Bounds (2024), UNCTAD (2021), and Universal Postal Union (n.d.a,d; 2021)

The industry architecture of the cross-border parcel market

Methodological approach to understanding role evolution

Definitions of roles

Kingpins
Bottlenecks
Orchestrators
Complementors

Historical milestones

Interviews & literature review

Evolution of the actor's industry architectural roles

Analysis during four periods

Three colour codes for highlighting the actor's role-applicability

Arguments backing the role's evolution

1. The **four time periods** analysed are until 2000, 2000-2010, 2010-2020, and 2020-2024.
2. The colours (**green, orange, and red**) represent how **fitting the industry architectural role is for that specific actor**, with green being the most applicable.

The roles

Kingpins

2000	2010	2020	2024

- The **dominant** or most influential player in the industry.
- Sets industry standards, dictates pricing, and shapes the competitive landscape.
- Other firms in the ecosystem depend on its decisions and resources.
- Example: **Apple in the smartphone industry**, which dictates app store policies and supplier requirements.

Bottlenecks

2000	2010	2020	2024

- The **critical constraint** in the value chain.
- Controls scarce resources, technology, or regulations that others must comply with.
- Often has pricing power and can extract significant value.
- Example: **TSMC in semiconductor manufacturing**, as it holds a monopoly on advanced chip production.

Orchestrators

2000	2010	2020	2024

- The **coordinator** of multiple players in the ecosystem.
- Ensures smooth collaboration, integrates various components, and optimizes efficiency.
- May not own all assets but facilitates their best use.
- Example: **Amazon in e-commerce**, orchestrating suppliers, sellers, logistics, and customers.

Complementors

2000	2010	2020	2024

- A firm that **adds value** to the ecosystem by enhancing the main product/service.
- Often dependent on kingpins or orchestrators but plays a crucial supporting role.
- Example: **App developers for Apple's App Store**, providing applications that enhance iPhone usability.

Source: Own composition based on conducted interviews, desk research, and key historical milestones slide

Role evolution of postal operators across two decades

Kingpins

2000	2010	2020	2024

- Started **in monopolistic positions in letters** with control and required infrastructure. With the UPU, posts were able to **expand globally.**
- Next, POs stayed strong due to **the legal protection of letters**, and most consumer parcels moved through **local posts**.
- Then, the **parcel market grew, terminal dues reformed**, and posts lost their **price-setting dominance**.
- Today, newer logistical players **bypass the postal network** with **own extensive networks**, decreasing the **postal's network importance**.

Bottlenecks

2000	2010	2020	2024

- Started with **exclusive international routing** with UPU membership and **strong domestic distribution networks**.
- Next, the **parcel landscape** got **more competitive**, with the POs' **high-value express parcel** market share decreasing.
- Then, **big e-commerce players** also partnered with **non-postal players**, weakening the postal network as a **'choke point'.**
- Today, large logistical players have their own **alternative networks**, sometimes **local fulfilment channels. Stricter customs rules** levelled the **playing field**, making the postal channel less 'easy'.

Orchestrators

2000	2010	2020	2024

- Started as **participants** in the **UPU-orchestrated international network** to perform the **postal delivery service**.
- Next, some POs **started alliances** with **emerging online merchants**.
- Then, some POs **actively coordinated with online merchants** and the **IT solutions improved significantly** to harmonise data exchange.
- Today, POs **strongly improve data exchanges and collaborate more regionally**, while the **platform-driven ecosystem** logistics are more **globally orchestrated**.

Complementors

2000	2010	2020	2024

- Started as the **'default' channel for mail;** no need to function as complementors.
- Next, POs became more **shipping partners** of the emerging **online marketplaces**, making them **enablers.**
- Then, some POs greatly **improved integration with e-commerce platforms and SMEs** with services for **tracking and returns**, supporting platforms' value proposition.
- Today, POs **remain solid cross-border channel for low-value goods**. Online marketplaces are also partnering with private in-house logistics, **creating alternative complements.**

Source: Own composition based on conducted interviews, desk research, and key historical milestones slide

Role evolution of integrators across two decades

Kingpins

2000	2010	2020	2024

- Started as **market leader** in **time-sensitive shipments**, mainly for **B2B** express.
- Next, integrators become **go-to carriers** for **fast, cross-border delivery** with **extensive** (aviation) **networks**. They set standards with **on-time delivery guarantees** and **tracking**.
- Next, remained **dominant** in **premium cross-border traffic** and specialised in **added value services** like customs clearance.
- Today, they **continued dominating B2B and premium services** while struggling to **enter the competitive B2C delivery market.**

Bottlenecks

2000	2010	2020	2024

- Started with **strong choke points** in **international express,** although **limited to high-value** and **time-sensitive deliveries**.
- Next, **strong control** over (air cargo) **networks** and a pioneering role **in electronic customs clearance**. **Replicating** their **infrastructure** and **expertise** made nearly impossible.
- Then, focused on **high-margin e-commerce delivery segments** and become **indispensable** for **specific sectors** like healthcare and automotive.
- Today, **bottleneck** remains in **the high-priority segment**, but the market is **broadening beyond** their exclusive choke points.

Orchestrators

2000	2010	2020	2024

- Started as **closed, express, point-to-point service providers,** with most **transactional relationships**.
- Next, **started with platform integration**, better alignment with **custom authorities**, and partnerships with **major e-retailers**.
- Then, **tracking and developer tools** further improved, but remained more of a **one-stop-shop**.
- Today, they **coordinate multiple parties** under their umbrella for **end-to-end solutions** but remain **commercial gatekeepers** as they **orchestrate** under their **own brand and control**.

Complementors

2000	2010	2020	2024

- Started as **largely standalone logistics providers** and primary carriers for **express shipments**.
- Next, began to **increase** e-commerce platform **offering specialised solutions, but were considered** the **premium shipping option**.
- Then, better and closer **collaboration** with e-commerce platforms by **guaranteeing speed, reliable customs handling**, and **end-to-end visibility**.
- Today, **express option** part of e-commerce platform's offerings and **increased co-development** for quick shipment and returns.

Source: Own composition based on conducted interviews, desk research, and key historical milestones slide

Role evolution of e-commerce marketplaces & ecosystems across two decades

Kingpins

2000	2010	2020	2024

- Started mostly **after the 2000s**, making them not **relevant enough** at this time for **this role**.
- Next, **online marketplaces** started to grow and **shape the standard online** with reviews, third-party sellers, and payment methods.
- Next, **massive growth** led to **gatekeeping positions** to large consumer bases. Strong **logistical integration** resulting in **greater value chain control**.
- Today, they **remain** in their **dictating status** regarding **online standards** and **capturing** significant **e-commerce market share**.

Bottlenecks

2000	2010	2020	2024

- Started mostly **after the 2000s**, making them not **relevant enough** at this time for **this role**.
- Next, acting as **essential sales channels** for many small/medium sellers, **creating some dependency**. However, **no monopoly over consumer access**.
- Then, **many SMEs worldwide dependent** on the **online marketplaces** and **ecosystems**. **Fulfilment services** provided ability to **steer or constrain** shipping flows.
- Today**, indispensable for SMEs** to reach mass global audiences, improved **logistical vertical integration**, and **strong social-commerce growth**.

Orchestrators

2000	2010	2020	2024

- Started mostly **after the 2000s**, making them not **relevant enough** at this time for **this role**.
- Next, **third-party sellers** allowed on the platforms. Early, **partial orchestration** with **no extensive data integration** with **external logistics service providers**.
- Then, started **orchestrating millions of merchants** on the platforms. **Co-creating** of **value** for sellers and the marketplace.
- Today, **expanded offerings to end-to-end ecosystem** solutions (payments, data analytics, warehousing, cloud services,…). **New ecosystem entrants** quickly **dominate specific sectors**.

Complementors

2000	2010	2020	2024

- Started mostly **after the 2000s**, making them not **relevant enough** at this time for **this role**.
- Next, they effectively were the **main e-commerce site** and established themselves as **primary digital channels**.
- Then, **core offerings** such as cloud services, payment systems, and integrated **logistics complemented other industry players** while **not** making the e-commerce players **complementors**.
- Today, **more integration** into **social media channels**, making them some what a complementor. **Overall, they remain the main environment**.

Source: Own composition based on conducted interviews, desk research, and key historical milestones slide

Role evolution of parcel operators across two decades

Kingpins

2000	2010	2020	2024

- Started mostly **after the 2000s**, making them not **relevant enough** at this time for **this role**.
- Next, they **began scaling their networks**, especially in Europe. However, faced **intense competition** from integrators and postal operators.
- Next, gained **strong market share growth** in the **B2C delivery segment**. Some of them became **regional market leaders**.
- Today, they become even more **essential last-mile carriers**. Limited **market-wide dominance** by a **single parcel operator**.

Bottlenecks

2000	2010	2020	2024

- Started when **postal operators** dominated **last-mile deliveries**, limiting them from controlling **critical distribution infrastructures**.
- Next, became more **important for SMEs**, but **strong alternatives** were still present. Had **limited control** over entire value chains.
- Then, became more **critical in some domestic/regional markets** and gained a strong market share**. No full control of the resources** that all players needed.
- Today, stronger **negotiating power** due to the e-commerce boom. **New entrants** provide **similar alternative services**.

Orchestrators

2000	2010	2020	2024

- Started as **service providers** for more 'straightforward' shipments.
- Next, started **coordinating** with local retail partners but **remained** rather **transactional**.
- Then, strongly **improved integration** with and for **e-commerce platforms** and a strong **network** of (third-party) **pick-up locations**.
- Today, **closer collaboration** with **local players and lockers**, which can be seen as **orchestrating last-mile ecosystems**. They have a **strong partial control** rather than **coordination of entire** (e-commerce) parcel **chains**.

Complementors

2000	2010	2020	2024

- Started as primarily. **stand-alone courier services**.
- Next, provided **lower-cost shipping** or **tailor-made alternatives** for SMEs, increasing their attractiveness.
- Then, significant improvement of **dedicated networks** with **cost-effective or value-added services**, strongly **enabling** e-commerce growth.
- Today, continued introducing **new (co-developed) delivery solutions** to increase the attractiveness of **e-commerce**. Provide strong **alternatives** for the increased number of **in-house logistical solutions**.

Source: Own composition based on conducted interviews, desk research, and key historical milestones slide

Key Takeaways

Kingpins	Bottlenecks	Orchestrators	Complementors
Postal Players	Postal Players	→	Postal Players
Integrators	Integrators	→	Integrators
eCommerce ecosystems	eCommerce ecosystems	eCommerce ecosystems	
			Parcel Players

Change trigger = Owning the data

Source: Own composition based on conducted interviews, desk research, and key historical milestones slide

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