"Gravity" and the Packaging of B2C Cross-Border Ecommerce

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1 Introduction

World trade in physical goods increased 7.7%, from $18.1 to $19.5 trillion between 2012 and 2018. Cross-border business-to-consumer (B2C) ecommerce trade stands at an estimated $500 bn and grew by 224% in volume over the same period, the fastest-growing segment in world trade. The individualization of trade through ecommerce promises increased consumer welfare through greater choice, better prices, and enhanced efficiency. However, the packaging of trade in an estimated 2.87 billion annually of unique, small, lightweight, and low-value packets, arriving one-by-one, is testing inbound sorting and delivery networks and challenging extant logistic and trade rules designed for a previous, less connected age of traditional trade flows.

An enduring finding in the international economics literature is that bilateral trade flows are subject to "gravity"; a country trades more with large and nearby countries than with those that are small and at a distance (Tinbergen 1962). Yet established patterns of cross-border ecommerce suggest that the sale of online physical goods may not be subject to "gravity" in the way that the standard model would suggest. China, in particular, is a major source of cross-border ecommerce volumes. There is a concern that its dominance might reflect price and policy distortions that weaken the distance deterrent and cause trade distorting, rather than trade-creating, bilateral flows (Navarro 2019).[1]

[1] Viner (1950) was first to distinguish between trade creation and trade diversion. Trade creation refers to trade between two countries based on comparative advantage determined by factor endowments, technology, and other genuine cost advantages. Trade diversion is exchange based on distortion such that flows from least-cost production countries are displaced by trade from higher-cost countries. Trade creation increases net global trade through welfare-promoting, optimal resource allocation between trading pairs.

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This chapter reviews trade-related policy aspects that might explain patterns of cross-border ecommerce. The next section examines the fundamentals of cross-border ecommerce, compared to the standard trade model. Section 3 reviews economists' gravity model and explores the geography of flows. Section 4 considers the role of illicit trade through small packets, while Sects. 5 and 6 review tax aspects of ecommerce. Section 7 discusses logistic-related issues, including terminal dues (TDs), as explanations for the apparent suspension of "gravity." Sect. 8 concludes the chapter.

2 The Fundamentals of Cross-Border Ecommerce Trade

Cross-border B2C ecommerce can be defined as the use of the internet by businesses to sell goods across national borders to consumers using digital platforms and physical networks. Access to supply-side platforms (marketplaces, retailers, and brands) and demand-side integrators (such as Facebook and Amazon Prime) supported by transaction enablers (payment solutions, software specialists, and delivery companies) integrates digital and physical components of a transaction in cross-border B2C sales.

Table 1 provides an estimate (Apex Insight 2019) that total cross-border ecommerce grew to 2.87 billion items between 2012 and 2018, a rise of 224%. China's outbound volumes increased even more, 430% to over 1 billion items, increasing its share of global outbound volumes from 22.9% to 37.5% over the period.

The top four global marketplaces (Amazon, Alibaba, eBay, and Wish) accounted for 63% of B2C cross-border ecommerce items. Such packets are typically small and lightweight, with 80% arriving without having paid taxes or duties (delivery-duty-unpaid). Eighty-four percent of items are below 2 kg, and 50% weigh less than 500 g. Average order values are also low. Eighteen percent of items are

Table 1 Cross-border ecommerce, 2012 and 2018 million parcels

	2012	2018	Percentage change
Cross-border (outbound)			
China	203	1076	430
Rest of the world	683	1793	162
Global cross-border total	**886**	**2870**	**224**
Total domestic and cross-border			
China	3411	36,939	983
Rest of the world	7946	17,050	115
Global total	**11,357**	**53,988**	**375**

Source: Estimates based on Apex Insight, 2019
Notes: Based on data for the 16 largest countries, covering about 88% of all volumes
Smaller countries estimated based on their global share of online retail, population, and/or GDP
Parcel upper weight limit varies by carrier

valued below €9, and 40% are valued at less than €24 (IPC 2019). The quantities, growth, and the characteristics of these singular item flows challenge the capacities of border authorities compared to conventional, high-value, bulk commercial trade streams.

Two-sided platforms facilitate cross-border exchange of a vast assortment of goods from digitized merchant catalogues, by aggregating and organizing information from beyond national frontiers. Search, transaction, and contract enforcement costs, which otherwise typically grow as distance increases, are radically reduced. Web shops represent global showrooms deploying user data and intangible marketing assets (such as brand, design rights, intellectual property, and customer relationships) to create value. In GATS terminology, the provision of services shifts from the commercial presence of a locally established affiliate (Mode 3) to cross-border supply through telecommunications and postal services (Mode 1).

In this way, online retailers with only a limited physical presence in consumption jurisdictions can develop a large customer base and know more about their needs, willingness to pay, and preferences than a physical, local business in situ. The fear, however, is that digital trading can more easily displace revenues toward low corporation tax centers than conventional trade. Ecommerce certainly fosters the ability to build cross-jurisdictional economic scale without physical mass in users' countries, breaking the link between the location in which value is created and where the profits are taxed.

While trade through individual consumers, acting as the principal importing agents, has the potential to promote economic welfare, the fragmentation of trade into millions of small packets raises "health, safety and security challenges that governments need to address" (OECD 2018, 110). New classes of sellers and buyers (including occasional and seasonal shippers and shoppers) are empowered. This brings risks associated with the limited knowledge of diverse exporters and multiple shipments to many individual consignee importers.

These risks are increased due to the fluid and diverse way ecommerce consignments are fulfilled, distributed, and delivered. B2C cross-border ecommerce can be conducted through posts' internationally brokered networks, including postal customs clearance and UPU documentation. B2C exchange might also take place through integrated, end-to-end networks of the kind provided by express carriers with cargo clearance and commercial airway bills. Alternatively, a consolidator model involves commercial customs clearance through the EU's low-value bulk import schemes (in the USA through Section 321 clearance) which allows traders to declare, in simplified format, multiple low-value consignments as a single customs import entry with a reduced data set while remaining below tax and duty de minimis thresholds. Finally, based on predictive analytics, bonded warehouse operations in destination markets hold high-demand stock for release and delivery on order.

Alternative distribution models support a range of services for reliability, price, and value-added features to cater for both the low-value and higher average order value segments of the market. However, discontinuity in regulatory burdens, and therefore trade costs between the various operational models, can create an incentive for opportunistic behavior and a challenge for market surveillance authorities.

3 Ecommerce and the Gravity Effect

The gravity equation is "the workhorse model" to explain international trade flows (Möhlmann et al. 2010, 226). Inspired by Newtonian physics in which gravitational forces between two bodies depend on their mass and distance, the gravity model relates bilateral trade flows to the GDP levels of the countries and their distance, including regulatory, cultural, and legal differences as well as propinquity. Despite the long-term decline in transport and communication costs, the impact of distance on the geography of traditional trade remains significant.[2]

Consumer data show that cross-border ecommerce interactions are fostered by "the positive effect of adjacency" (Head and Mayer 2010, 190) with bilateral flows shaped by large and geographically close clusters of countries. In Belgium, 49% of ecommerce purchases are from France, in Ireland, 58% of purchases are from UK websites, and in Austria 68% of purchases are from Germany (WIK-Consult 2019). Outside Europe, too, the gravitational pull of adjacency is present. For example, 53% of Canadians' most recent purchase come from the USA (IPC 2019).

China, however, is a significant source country for virtually all EU states. In Hungary, as many as 67% of B2C purchases are from China (compared, based on 2018 IMF trade statistics, to just 5.3% of Hungary's total imports coming from China). In the UK, Europe's largest ecommerce market, fully one-third of purchases are from China, far higher than might be predicted with a "gravity" view of the world (and three times greater than overall UK imports from China at 11.7%). For Germany, too, whereas 41% of ecommerce purchases are from China (WIK-Consult 2019), just 7% of its total imports are from China. IPC data confirm China's dominance, with, for example, 57% of US cross-border purchases coming from China (compared to 29.3% of total US imports). Overall, China's share of total ecommerce export volumes has risen from 26% to 36% between 2016 and 2018, the same share as the next three countries, Germany, the UK, and the USA, combined (IPC 2019).

We would expect that distance had a smaller effect on the online trade due to lower search costs,[3] the erosion of "intangible barriers to trade" (laws, language, and culture), and reduction in the mental distance between exporters and importers (Möhlmann et al. 2010, 226), for example, through website localization and local payment options. To the extent, too, that distance proxies for taste, geography might shrink as consumer tastes converge, particularly for standard products with a higher elasticity of substitution between imported and domestic goods (Blum and Goldfarb 2006, 385). China's growing cross-border dominance might additionally

[2] Krugman and Obstfeld (2006) found a strong negative effect of distance on trade in physical goods: each 1% increase in distance between two countries is associated with a fall of between 0.7% and 1.0% in trade.

[3] One study, comparing the distance effect on eBay and for total trade for 40 product categories across 61 counties between 2004 and 2009, found that the coefficient of distance is on average 65% smaller on eBay than offline. This difference is explained in most part by a reduction in search costs and reduced information frictions due to eBay's consumer ratings (Lendle et al. 2016).

be understood by the innovation and strength of its domestic ecommerce sector, including the Chinese government's support for the industry to internationalize, for example, through its Belt and Road Initiative, such that single-piece Chinese ecommerce packets now arrive in Europe consolidated in containers on trains.

However, the gravity model explains bilateral trade flows not just in relation to GDP but also by policies and prices which affect exchange costs and frictions. Thus, an explanation for China's seemingly disproportionate share of total cross-border ecommerce should include institutional arrangements such as the scope for illicit trade in small packets, differential application of fiscal and non-fiscal rules at borders, and differences in delivery costs. Where costs are not reflected in ecommerce exchange between bilateral pairs, "gravity" is likely to be suspended, resulting in trade diversion where product origin shifts from a domestic producer, whose resource costs are otherwise lower, to an overseas producer whose costs are higher.

4 Illicit Trade in Small Packets

Trade based on Ricardian comparative advantage requires clear rules and effective enforcement such that illicit flows are constrained. Illicit flows violate the laws of exporting or importing countries, by infringing trademarks, patents, and design rights or by breaching product safety rules and other prohibitions. Illicit merchandise represents "free-riding" on the intellectual property rights of others and undermines trade creation based on innovation, creativity, and design. Such flows unfairly disadvantage legitimate domestic and overseas retailers, threaten consumers' health and safety, and reduce domestic tax revenues. In so doing, the weight of "gravity" is reduced, and trade diversion is promoted.

Counterfeit and pirated goods are increasing in international trade, rising from 2.5% to 3.3% of world trade between 2013 and 2016, the main cause of which is corruption and failure to enforce in provenance countries (OECD 2018). Most counterfeits are traded in bulk imports, with container ships dominating, 56%; compared to mail, 11%; and express, 8% (OECD/EUIPO 2019:2).

That said, ecommerce can swell illicit flows. On the demand side, availability and low shipping fees drive greater consumer complicity, with 7% of online shoppers having bought counterfeit goods, rising to 15% among 15–24 year olds. On the supply-side, trading online affords greater scope for anonymity and allows easy access 24/7 to multiple market. China is the largest source country for illicit goods including the key ecommerce categories of apparel, electronics, and cosmetics as well as synthetic drugs, such as fentanyl, whose primary mode of shipment is through postal and express streams often in quantities below 1 kg (OECD 2018).[4]

[4] China is acting against illicit trade in ecommerce. Article 42 of China's new Ecommerce Law, January 2019, requires platforms to take all necessary measures against IP violation, with fines of up to 500,000 RMB.

The wave of anonymous, small packets poses a particular challenge for postal flows, where the amount of information on items is limited and often not received before arrival. This lack of data makes it difficult to assess, target, and interdict "on a granular scale" (OECD 2018, 110) with the risk that illicit, trade-diverting ecommerce packets will provoke a policy reaction that impedes licit, trade-creating flows.

Hitherto, while third-party (eBay, Alibaba, Etsy, and Rakuten) and vertically integrated marketplaces (Amazon) allow users to transact, unless they have taken title of the goods as the merchant of record, it is the suppliers of merchandise who retain control of the goods as well as of any liabilities toward consumers, for example, as in respect of product safety and VAT. Such is the growth in small packet volumes, however, that border agencies are beginning to hold marketplaces and carriers responsible for import liabilities, rather than the seller or the consumer as the merchant of record, because authorities neither have the jurisdiction to enforce against overseas sellers nor the resources to apply rules on millions of individual buyers.

Additionally, many jurisdictions are requiring electronic data ahead of the goods' arrival, including country of origin and item data on ecommerce flows. Advanced security data allows authorities to "push the border out" (OECD 2018, 95) and is an important factor in reducing the volume of illicit shipments.[5] Data sharing across the value chain may simultaneously enhance facilitation, with packets from low-risk trusted traders handled speedily through "green lanes" while customs dedicate resource to more challenging, trade diverted shipments. Nonetheless, additional costs from new liabilities and data requirements will impact the volume and character of flows and assist in bearing down on distortions which undermine the efficiency of trade.

5 Physical Presence and Taxation

Under Article 7 of the OECD Model Tax Convention, countries may tax the profits from commercial activity carried out within its borders by a foreign entity if the latter has a substantial physical presence. This permanent establishment test provides not only clear rules for ascertaining the tax due from companies operating overseas but also an equitable basis for sharing the taxation benefits arising from cross-border commerce. The reach of ecommerce, however, allows firms to be involved in the economic activity of multiple nations without any physical presence. The basis for international profits taxation is thus increasingly out of touch with modern commerce. The physical presence rule creates an increasingly artificial distinction

[5] Article 17.2.16 of the UPU's Regulations and the EU's Union Customs Code, 952/2013, obliges all posts to provide electronic advance data on all small packets containing goods by 1 January 2021.Since 1 January 2019, the USA's STOP Act requires that advanced electronic security data is provided on 100% of inbound items by 31 December 2020. China's 2019 Ecommerce Act also incentivizes the provision of item-level advance data.

between traders and results in profits base erosion which the OECD aims to address by 2020. Divergent and less onerous direct tax treatment of remote sellers compared to local traders with physical presence distorts the geography of ecommerce.

The European concept of permanent establishment is comparable to the US physical nexus test, whereby a US state is entitled to impose state and local sales taxes on an enterprise of another US state, if that business maintains a substantial physical presence within the state in which it trades. Before the advent of ecommerce, the US Supreme Court had determined (in 1967 and in 1992) that the "mere shipment" of catalogue ordered goods did not satisfy the physical presence requirement" (South Dakota v Wayfair Inc., 585 U.S. ___, 138 S. Ct. 2080 (2018), 1, hereafter Wayfair).

However, in its 2018 Wayfair decision, the US Supreme Court overturned the need for a physical presence as the basis for out-of-state sellers to collect and remit sales tax. The Court ruled that "it is an inescapable fact" of the modern economy that business can be transacted without any physical presence. Besides, the majority opined that a pure-play online retailer might be said to have a physical presence by virtue of its customers' computers, cookies saved to their hard drives, or apps on their mobile devices and that a business with "substantial virtual connections" did not need to be present in the traditional sense of that term (South Dakota v Wayfair Inc 2018, 15).

The potential for indirect tax to reduce market distortions ran through the Supreme Court's judgment. It argued that to treat a business with a small warehouse within a state differently to an out-of-state company with a pervasive online presence would be "arbitrary," "anachronistic," and "unfair and unjust" that it simply made "no sense" to create a tax shelter for businesses that limit their physical presence and permit the "tax-free solicitation of customers" (South Dakota v Wayfair Inc 2018, 14–17. The Court implicitly recognized that the incidence of tax will fall in part at least on consumers and that this is likely to restrain growth of domestic and cross-border ecommerce.[6]

6 Customs and De Minimis

While Wayfair did not explicitly refer to inbound cross-border items, international sellers who are the merchant-of-record and whose volumes reach state threshold levels have become liable to collect and remit US state and municipal taxes, effectively circumventing the USA's federal $800 de minimis introduced as a facilitation measure in 2016. Outside the USA, too, a growing number of countries are seeking to collect indirect taxes on what the New Zealand legislation refers to as

[6] Drawing on US household data and matching these to local sales tax rates, one study found that "internet sales are highly sensitive to local taxation" and that a 10% increase in the after-tax price of a good was likely to induce a 20–40% decrease in sales from web-based firms (Goolsbee 2000).

"distantly taxable goods" contained within all small packets through the removal of de minimis tax exemptions (New Zealand 2018, Section 4b).[7]

The removal of low-value de minimis exemptions may reflect a shift in border priorities from trade facilitation to revenue collection, fair trade, and control. When de minimis levels were introduced, there were few individual purchases of low-value imported goods. Compliance and administrative costs involved in taxing such imports outweighed tax revenues collected. However, the growth in cross-border ecommerce has meant that the revenues foregone are increasingly significant and domestic businesses are disadvantaged compared with offshore firms whose prices exclude indirect taxes. The EU, for example, estimated that the foregone VAT on inbound ecommerce packets below its de minimis level (€22), plus non-compliance and fraud (mis-declaration of goods, including items presented as consumer-to-consumer "gifts," undervaluation, and split entries) amounted to a loss of €4.2 billion annually (Deloitte 2016, 21).

One result of this realignment of border priorities is a fundamental change in liabilities which has hitherto underpinned ecommerce sales. For example, since July 2018, it is mandatory for offshore sellers to Australia to register with the tax authorities. They are deemed for GST purposes to be the supplier of goods (merchant of record) sold to Australian consumers. In the EU, while not compulsory, sellers are encouraged to register with the EU's import one-stop-shop and will be liable to collect VAT at the point of sale and remit these funds to destination member states without any de minimis exemptions. VAT liability will also apply on the sale of goods stored by non-EU companies in EU-based fulfillment centers, even if payments are processed from an address outside the EU. This is based on the observation that Chinese warehouses in the UK were fulfilling goods "but processing payments from addresses outside the UK," thus avoiding VAT and gaining competitive advantage (EY 2015, 79).

Where small packets arrive in the EU with VAT unpaid, the tax will be collected from consumers by the customs declarant, typically the postal operator, courier, or customs agent. Copenhagen Economics estimated that this VAT fallback liability would cause "major and disproportionate costs" for declarants, estimated at between €0.7 and €1.9 bn (2017, 1). To avoid such additional costs ultimately flowing to buyers, platforms selling into the EU are likely to be incentivized to remove the option of a delivery duty unpaid service from their websites.[8]

[7] The GST Offshore Supplier Registration Bill (2018) requires offshore websites with annual sales to New Zealanders above NZ$60,000 to register and collect GST (15%) on imported goods valued up to NZ$1000 from 1 October 2019. The explicit goal is to improve and ensure competitive neutrality for domestic retailers. Many countries are introducing similar schemes including Sweden (March 2018), Australia (July 2018), Switzerland (January 2019), and the EU (January 2021).

[8] The costs of policing the border are becoming visible in other ways. The South Africa Post Office charges recipients 25 Rand on each inbound packet, revenue which they share with customs; and Australia's Home Affairs department are considering an AUS $5–7 tax on inbound low-value packets to cover the costs of biosecurity screening. Other external costs such as relating to carbon emissions, packaging, and the environment may also not be reflected in prices, especially the pricing of ecommerce returns.

For example, under pressure from domestic retailers, PostNord Sweden was required to collect VAT (25%) and duties on inbound packets with a value below €150 from 1 March 2018. To defray collection costs, a fee of up to 125 SEK (≈ €12.5) was added. As a consequence, inbound shipments fell by 90%, from 150,000 to 15,000 per day, with much of this decline occurring in the low-value, trade-diverted segment. Volumes have begun to return, including through new delivery duty paid solutions offered by websites targeting Swedish consumers and by the rerouting of flows for free circulation clearance in neighboring EU states where VAT on low-value consignments is not yet a requirement. The application of VAT to outbound Jersey Post packets in 2012 saw a similar collapse in volumes from 60 to 5 million per annum, and early data from Australia suggests that the levying of GST (10%) from 1 July 2018 may have reduced inbound volumes in excess of 20% over prior year, with perhaps still higher reductions on low average order value packets.[9]

We might deduce from these changes that the individualization of trade, and pace of its growth, is changing the balance of border priorities in the USA, Europe, and elsewhere.[10] There is greater focus on revenue generation (and its fair distribution), security control, and the removal of competitive distortions that promote trade-diverting ecommerce. The move toward taxing the profits on digital sales of physical goods, the removal of de minimis indirect tax exemptions on low-value inbound consignments, and the externalization of other border costs will restore somewhat the force of "gravity" and the competitiveness of local, in-market sales over foreign ecommerce trade.

7 Terminal Dues

The seemingly weak pull of "gravity" in cross-border ecommerce may be further explained by small packet shipping rates. Distribution and delivery represent some 60% of total costs (excluding merchandise) and strongly affect B2C imports. The critical inbound delivery rate that posts pay each other for the delivery of cross-border packets below 2 kg is terminal dues (TDs), and these rates are set on a one-country, one-vote basis within the Universal Postal Union (UPU). While TD rates are only available to each national designated post, TDs are the reference rate against

[9] These negative volume impacts differ significantly from EY's review of price and import elasticities for typical ecommerce categories. EY concluded somewhat confusingly that the demand for ecommerce goods is "largely inelastic" but that data limitations meant that the impact of VAT on consumers' purchasing decisions could be "significant" (EY 2015, 111–112).

[10] Perhaps reflecting a valorization of trade facilitation over control and revenue collection, the USA increased its postal and express de minimis in 2016 from $200 to $800 (US Trade Facilitation and Trade Enforcement Act 2015). However, under the terms of the facilitation chapter of the 2019 US, Mexico, and Canadian Agreement, the USA reserved the right to impose a lower, "reciprocal amount" equal to Mexico and Canada's agreed threshold levels which, if exercised, would take the US de minimis threshold below the $200 amount that had existed prior to 2016 (Footnote 3 to Article 7.8 (1) (f) of the USMCA).

which bilateral and commercial rates are negotiated. They thus indirectly affect all inbound rates, even constraining prices that can be achieved for value-added elements (such as tracking) in the higher order value segments of the market.

TDs are based on a complex per item and per kg formula based on the capping of delivery costs to high-cost destinations and the protection of developing countries by cost floors below which their revenue cannot fall. The system includes separate rates payable by posts in industrialized (Group I), advanced developing (II), mid-level developing (III), and the least developed (Group IV) countries. As a result, TDs are not related to destination country domestic delivery costs and distort trade patterns. Campbell (2016, 313) commented that a structurally unreformed TD system represented "a signal failure in modern international trade policy."

Changes to the TDs system were introduced at the 2016 Istanbul Congress for the period 2018–2022, including the move of China to a higher-cost category (Group III) and annual, but differentiated, increases in caps rates across all countries, with China's Group III rates rising 13% per annum compared to least developed country increases of 2% per kg per annum. Higher supplementary terminal due rates were also established for the UPU's signature-on-delivery product, which some posts had been accessing for ecommerce packets in the absence of affordable, tracked UPU packet service. These reforms reduced the discount to equivalent domestic rates between many bilateral pairs and will have a volume impact, though such is the scale of cross-border ecommerce growth that net financial transfers between low cost and net exporter posts and high cost and net importers will continue to increase (Okholm et al. 2017, 85).

From a trade perspective, below cost inbound delivery prices weaken the distance deterrent and incentivize producers and consumers to move industrial country sales offshore. As a memorandum from the US President put it, TDs "distorts the flow of small packets around the world by incentivizing the shipping of goods from foreign countries that benefit from artificially low reimbursement rates" (US Presidential Memorandum 2018, 3). The USA thus declared that the United States Postal Service (USPS) would adopt self-declared inbound packets rates, at 100% of domestic rates for comparable services no later than 1 January 2020 and gave 1-year notice of withdrawal from the UPU in order to bring pressure to bear for structural reform (US White House 2018).

Whatever the outcome of TDs discussions among the world's posts, ecommerce delivery prices (inbound to the USA and, in consequence, to all other markets) will increase significantly. The USA may not be able to secure agreement for TD rates to be based on 100% of domestic tariffs, but a move toward 70% of domestic rates does have precedence in regional postal remuneration systems. Increased TDs will test the findings of existing postal gravity studies that suggest the absence of search costs alone explains the pattern of online ecommerce. The eBay transactional data study, for example, concluded that adding shipping costs to the model barely affects the distance coefficient on all country pairs and that therefore the "death of distance" on eBay flows is "most-likely not due to a reduction or different distribution of shipping costs" (Lendle et al. 2016, 418). Similar studies have found that the

distance coefficients are "well below" the −0.9 average elasticity of distance, suggesting packets volumes were less sensitive to transport and related costs (Anson and Helble 2013, 42).

An alternative hypothesis might be that at such low rates for postal cross-border delivery, "gravity" and the impact of shipping costs on bilateral trade volumes are switched-off. While low online search costs, a rich assortment of products on Chinese marketplaces, convenience, and local payment solutions, will continue to support online cross-border shopping, higher delivery costs, in addition to direct and indirect taxes and controls at borders, is likely to increase gravity's power on such trade.

The basis of advantage, too, between cross-border operational models will change. Below-cost TDs may have incentivized UPU members to forge competitiveness on cost alone, rather than by though improved quality, reliability and service features. If the mix of cross-border volumes shifts from trade-distorted, low-value delivery-duty-unpaid packets to higher-value duty-paid items, improved network reliability, digital support for the physical flows, and greater integration between actors across the global value-chain will be necessary, both as a competitive differentiator and to address the needs of border authorities as they rebalance control with facilitation through advanced electronic security data.

TDs are only available to designated operators, not to other carriers, nor to posts' extraterritorial offices of exchange (ETOEs).[11] ETOEs are a significant part of the market, with some 150 facilities competing against national posts and other carriers in major outbound ecommerce delivery markets. While such competition supports efficiency and quality improvement in cross-border ecommerce, some ETOEs surreptitiously access favorable TD rates, rather than the inbound post's domestic delivery rates, thus amplifying distortions. There is evidence, too, that in "a growing number of cases" (Portugal 2019) commercial companies use "the postal indicia of group IV" posts for the remailing of items (New Zealand 2019). These practices intensify price-based competition from an industry weaned on below-cost TDs and distort flows toward imports from countries paying artificially low TDs.

Greater TD cost coverage will be consequential in terms of volume, geography, and networks. Progressively higher inbound delivery rates are likely to restrain growth rates witnessed over recent years with perhaps the low-value segment of the market disappearing entirely or shifting from a B2C postal model to bonded warehouse operations for popular stock categories in destination markets. Further changes toward more cost-reflective inbound rates will reduce trade distortions by changing online buying patterns, and the flow of packets between origin and destination pairs, to the benefit of domestic retailers and local fulfillment.

[11] An ETOE is defined as a commercial processing facility operated by, or in connection with, a postal operator on the territory of another (ecommerce origin) country. Under the UPU Convention, ETOE volumes cannot use UPU documentation nor access TDs.

8 Conclusion

Though still a relatively small proportion of total trade, huge flows of individualized, small, lightweight, low-value packets are transforming the fundamentals of commerce. Cross-border ecommerce increases the heterogeneity of traders and brings benefits to consumers worldwide. However, the packaging of trade for personal use on the scale and at the growth rates of recent years was never anticipated. While consistency with the gravity principle can be observed in bilateral pair flows between neighboring countries, China's share is far higher than the level that might be predicted by a "gravity" view of trade.

The rapid growth of digitally ordered, direct-to-consumer packets has raised concerns as to whether policy and border practices are properly aligned to the new trade realities. To the extent that the institutional environment for cross-border packets may not have sufficiently protected property rights, nor treated domestic and overseas merchants equitably in terms of indirect taxation, buying decisions would have been skewed in favor of the overseas rather than the domestic supplier. Equally, if the costs of cross-border ecommerce, such as external or delivery costs, are not properly reflected in prices, excessive demand for cross-border over local purchases will result, undermining the welfare benefits of trade.

As a result, there is a reordering of border authorities' priorities as between security and fiscal control, fair trade and trade facilitation, and a shift in the treatment third-party marketplaces and carriers in respect of importer-of-record liabilities. Reordered border priorities will not be without consequences for volume, value and product mix (delivery duty paid), bilateral pair flows, and the competitive basis of cross-border ecommerce operational models. The challenge for policymakers will be to design controls on trade-diverted flows while fostering legitimate, trade-creating, and welfare-enhancing volumes.

References

Anson, J., & Helble, M. (2013). A gravity model of international postal exchanges. In M. A. Crew & P. R. Kleindorfer (Eds.), *Reforming the postal sector in the face of electronic competition*. Cheltenham: Edward Elgar.

Apex-Insight. (2019). *Global parcels insight report, March, London*.

Blum, B. S., & Goldfarb, A. (2006). Does the Internet defy the law of gravity? *Journal of International Economics, 70*(2), 384–405, Elsevier.

Campbell, J. I. (2016). Quantifying the distortive effects of UPU terminal dues. In M. A. Crew & T. J. Brennan (Eds.), *The future of the postal sector in a digital worlds*. Heidelberg: Springer.

Copenhagen Economics. (2017). *Effects of removing the VAT De Minimis on ecommerce imports,* 11th October, Copenhagen.

Deloitte. (2016). VAT aspects of cross-border E-commerce, March, DG Taxation and Customs Union, Brussels.

EY. (2015). *Assessment of the application and impact of VAT exemption and importation of small consignments*, Report to the European Commission.

Goolsbee, A. (2000). In a world without borders: The impact of taxes on internet commerce. *Quarterly Journal of Economics, 115*(2), 561–576.
Head, K., & Mayer, T. (2010). Illusory border effects. In A. G. Van Bergeijk & S. Brakman (Eds.), *The gravity model of international trade*. Cambridge: Cambridge University Press.
IPC. (2019). *Cross-border E-commerce shopper survey, 2018, January, Brussels*.
Krugman, Paul R. and Maurice Obstfeld (2006), *International economics, Longman*.
Lendle, A., Olareaga, M., Schropp, S., & Venzina, P.-L. (2016). There goes gravity: eBay and the death of distance. *Economic Journal, 126*(591), 406–441.
Möhlmann, L. J., Ederveen, S., de Groot, H. L. F., & Linders, G.-J. M. (2010). Intangible barriers to international trade. In A. G. Van Bergeijk & S. Brakman (Eds.), *The gravity model of international trade*. Cambridge: CUP.
Navarro, P. (2019). *Trump has a plan to stop fake goods, Wall Street Journal, April 3rd*.
New Zealand. (2018). *Taxation (annual rates for 2019–20) GST offshore supplier registration and remedial matters bill, 114–3, December 2019*.
New Zealand. (2019). *UPU international bureau circular, 25 19 February*.
OECD. (2018). *Governance frameworks to counter illicit trade, March, Paris*.
OECD/EUIPO. (2019). *Trends in trade in counterfeit and pirated goods, Paris*.
Okholm, H. B., Basalisco, B., Gårdebrink, J., & Boive, A. M. (2017). An economic perspective on terminal dues. In M. Crew, P. L. Parcu, & T. J. Brennan (Eds.), *The changing postal and delivery sector*. Heidelberg: Springer.
Portugal. (2019). *UPU international bureau circular 14,* 4 February 2019.
South Dakota v Wayfair Inc. (2018). 585 U.S. _ No 17–494 2018, 15, June 21st.
The Taxation (Annual Rates for 2019–20, GST Offshore Supplier Registration, and Remedial Matters) Bill (2018), New Zeland
Tinbergen, J. (1962). *Shaping the world economy*. New York: The Twentieth Century Fund.
U.S. Presidential Memorandum. (2018). *Modernizing the monetary reimbursement model for the delivery of goods through the international postal system and enhancing the security and safety of international mail,* August 23, Washington DC.
U.S. Trade Facilitation and Trade Enforcement Act, (2015). U.S. Congress, Washington DC.
U.S. White House. (2018). *Statement from the press secretary,* October 17th, Washington DC.
Viner, J. (1950). *The custom union issue*. London: Stevens and Son.
WIK-Consult. (2019). Development of cross-border E-commerce through parcel delivery. In *A study for the European Commission*. Brussels: DG GROW.