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The Eurasian landbridge: Implications of linking East Asia and Europe by rail

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ABSTRACT

Since 2011 regular freight rail services have been established between the European Union and China. This article analyses the development of these links – the Eurasian Landbridge – and argues that its origins were market-driven in response to demands of lead firms in Eurasian value chains. The rail services are consistent with EU and Chinese hopes for improved connectivity, reflected in major foreign economic policy announcements by the Chinese President (*The Belt and Road Initiative*) and by the European Commission (*Connecting Europe and Asia*). The resulting connectivity is likely to survive any bilateral political debacles because the economic foundation is strong.

1. Introduction

Overland transport links between the European Union (EU) and China were almost non-existent before 2011. Railway lines existed, notably the century-old TransSiberian Railway, but overland freight traffic from East Asia to Western Europe was minuscule. The paper documents the development of overland rail transport links between the EU and East Asia since 2011 and analyzes the consequences of the increased connectivity.

The central argument is that the catalyst for rail services between Europe and China was demands from automobile and electronics companies coordinating their Eurasian value chains, for which air freight was too expensive and sea freight too slow with imprecise arrival dates. Private sector agents responded by offering a variety of additional services which made rail freight attractive to more customers. The success of the rail Landbridge also depends upon collaboration of governments and national rail companies to facilitate transit by improving the soft infrastructure (e.g. minimizing border delays and bureaucratic requirements).

The process was largely market-driven. However, after the announcement of China's Silk Road Economic Belt in September 2013 and its incorporation into the Belt and Road Initiative (BRI) launched in May 2017, the Landbridge became consistent with the centrepiece of China's foreign economic policy. Policy statements of the EU Commission such as the 2016 Global Strategy and the 2018

Joint Communication on Connecting Europe and Asia also started to give greater prominence to connectivity to China.¹ The Master Plan of ASEAN Connectivity and the EU-Japan Partnership on Sustainable Connectivity and Quality Infrastructure are less directly related to EU-Asia overland links.²

Although rail freight will never match the quantity of sea freight or the speed of air freight between Europe and East Asia, rail freight has greater implications for sustainable connectivity. The nature of rail operations, compared to stacking a ship with twenty thousand containers, involves greater need for coordination, especially when shipments are links in international value chains whose success relies on just-in-time delivery of components at every stage of production, and more intimate connectivity. Electric trains along well-maintained track are also a more environmentally friendly mode of international transport than ships or planes; air freighting a 12,000-kilogram load from Chengdu to inland Western Europe produces about 54 tonnes of carbon dioxide, shipping by maritime and rail routes produces 3.3 tonnes, and railfreighting across the Landbridge produces 2.8 tonnes (EUCCC, 2020, 17).

¹ The Comprehensive Agreement on Investment concluded in principle by the EU and China on 30 December 2020 is a further sign of the partners' desire to increase economic interaction.

² The Master Plan of ASEAN Connectivity was adopted in 2010; the 2016 update (MPAC 2025) emphasized road upgrades, completion of the Kunming-Singapore railway and power interconnection between West Kalimantan and Sarawak. The EU-Japan Connectivity Partnership launched in September 2019 emphasised quality infrastructure but with little detail beyond a thematic focus on digital connectivity.

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2. Development 2011–19³

Between 1500 and 2010 trade between East Asia and Europe was dominated by maritime transport. Physical rail links existed but they were uncompetitive with sea freight, especially after the container revolution, when EU-Asia trade grew rapidly. The situation started to change in 2011 when rail services were established between western China and Europe (starting with Chengdu-Lódz and Chongqing-Duisburg). Since then, services have improved dramatically with regular services connecting a large number of China-EU city pairs and the annual number of containers travelling by rail roughly doubling each year. The process has been essentially market-driven (Pomfret, 2019b).

The first driver of EU-China rail services was the efforts by car and electronics companies to combine European and Asian value chains into Eurasian value chains (Pomfret, 2019a). The initial use of rail connections involved trains chartered by German car companies to take components from Germany to their assembly plant in China. Such block trains are reported in 2007 and subsequent years, but they were infrequent and the total number was small. Similar bespoke services were provided for Daewoo/GM to ship components from Korea via Lianyungang and then by rail through China and Kazakhstan to the car assembly plant in Uzbekistan. In 2011, the rail companies of China, Kazakhstan, Russia, Belarus and Germany initiated a weekly rail service between Chongqing and Duisburg. By 2013 the frequency had been increased to three times a week, and in 2016 the service became daily.

The increase in traffic created a virtuous circle. As rail services became more frequent and regular, freight forwarders responded by providing new services (e.g. part container loads, refrigerated containers, multimodal connections) with a greater variety of destinations. The number of city pairs providing freight services has increased rapidly, especially since 2015. Already in May 2017, China Railway Express trains were connecting 37 cities in China to destinations in eleven EU countries. The number of trips along the Landbridge more than doubled each year between 2011 and 2017. There is no consistent single data source (Bucsky, 2019), but typically cited numbers for journeys along the Landbridge are 17 (in 2011), 42 (2012), 80 (2013), 308 (2014), 815 (2015), 1,702 (2016), 3,673 (2017) and 6,363 (2018).⁴

This broadened the range of potential customers who were willing to pay more than sea freight for faster more reliable transport but unwilling to pay for air freight. Modal choice depends on the value/weight ratio of freight and on time sensitivity (Randrianarisoa et al., 2020, 17). Average value-weight ratios are higher for rail than for sea and lower by rail than by air. The scenario analysis of Zhang and Schramm (2020), taking into account total logistics costs, suggests substantial ranges of modal competition in 2018 (Table 1). For time-sensitive goods, rail was competitive with sea for goods worth more than \$1.23 per kilogram and with air for goods worth less than \$10.89 per kilogram. For goods with lower time sensitivity, rail is most competitive for goods valued between \$2.46/kg and \$21.78/kg.

The advantage of rail increased in the 2010 s. Air freight prices increased. Maritime shipping times lengthened, due to slow-steaming to save fuel and reduce pollution. Meanwhile rail freight became faster and cheaper (Fig. 1).

³ This section develops and updates arguments contained in online papers posted on 1 and 2 May 2018 at: <https://voxeu.org/article/eurasian-landbridge-linking-regional-value-chains> and <https://voxeu.org/article/eurasian-landbridge-and-chinas-belt-and-road-initiative>. For more in-depth analysis, see Pomfret (2020, chapter 3) and Duisburg.

⁴ For example, at <https://www.mordorintelligence.com/industry-reports/china-eu-ropo-rail-freight-transport-market>. Numbers are not necessarily balanced in both directions; in 2018, of the 1,442 trains on the most frequent route, between Duisburg and Chongqing, 728 were from the EU and 714 from China. China Railway reported 5,266 trips in the first eight months of 2019 (<http://www.globaltimes.cn/content/1164438.shtml>)

Table 1

Average value/Weight Ratio (USD/kilogram) by Mode of Transport, 2018.

	Sea	Rail	Air
China-EU (cif)	\$4.95	\$11.04	\$80.83
EU-China (fob)	\$2.04	\$13.01	\$117.43

Source: Zhang and Schramm (2020, Table 7).

Notes: based on Eurostat COMEXT Dataset DS-043327

Jakóbowski et al. (2018) have estimated shipment costs along different rail routes from China to Europe. All such numbers are approximations, but Table 2 clearly indicates the prohibitive cost of air transport for all but very high value-weight or extremely time-sensitive items. Rail is more expensive than sea, but the price gap narrows if places are further from seaports (e.g. Chengdu-Warsaw).⁵ In an early assessment of modal competition for Eurasian trade, Rodemann and Templar (2014) saw rail's shorter travel times as a major advantage in an age of GVCs, but emphasized problems of security and reliability; interstate arrangements like the UTLC resolved such problems by collaboration on passing sealed containers through border crossing points and on ensuring the track priority that allows regular services to run reliably to a timetable.⁶ Maritime transport from East Asia to Europe can be delayed by bad weather, piracy and congestion in the Suez Canal; the last point was highlighted when the 20,000-container ship Ever Given became stuck in March 2021, blocking the Canal for almost a week.

As more cities offer services, some successfully and others not, it is hard to keep track of numbers but in both Europe and China over fifty cities are now Landbridge termini. The most reliable volume data are from the Eurasian Rail Alliance, which reports growth in traffic along the China-Kazakhstan-Belarus route from 46,000 twenty-foot equivalent containers in 2015 to 333,000 in 2019 (Table 3). These numbers remain small compared to maritime freight where a single ship can carry 20,000 TEUs. Less than 5% of the value of all freight between Europe and Asia goes by rail (European Commission, 2018, 3). However, rail offers a strategic niche; rail is preferred for goods that are of higher value and more tech-intensive than the bulk goods transported by sea.

In Europe, indicators of the increased salience of the rail Landbridge include the holding of an annual Silk Road Summit attended by hundreds of logistics service providers.⁷ The EU Commission engaged in how to relate the EU-China service, and the BRI Belt, to the Trans-European Transport Network (TEN-T) as a top priority in 2020 (Walton, 2019). The Commission's interest can be traced back to the 2007-12 RETRACK project which aimed to induce a modal shift of freight traffic to rail; RETRACK's focus was on developing a high-quality commercially sustainable rail freight corridor from the North Sea to the Black Sea (Rotterdam-Constanza), but it also considered prospects for establishing "Eurasian land-bridges" to China. The conclusions of the RETRACK final report (van Rooijen et al., 2012), that the Trans-Siberian was the most immediately relevant route and routes via Kazakhstan had the best longer-term potential, while the TRACECA corridor was the least likely to flourish, have proven correct. Connectiv-

⁵ Developments in the early 2000s that contributed to demand for the rail Landbridge included the westward shift in China's manufacturing activity as wages and land costs increased along the east coast and the Eastern European countries' integration into European value chains as they prepared to join the EU (Rodemann & Templar, 2014, 76; Pepe, 2020, 13-16). Czechia, Hungary, Poland and Slovakia have been especially active value chain participants (Pomfret and Sourdin, 2018). Lódz established itself as the Eastern European hub for EU-China rail freight (Jakóbowski et al., 2018). Klaipėda (Lithuania) became a hub for southern Sweden.

⁶ The Eurasian Rail Alliance (UTLC) was founded by Belarus, Kazakhstan and Russia in 2014 to provide services for container block trains running between China and Europe. According to Bucsky (2019, 9), 80% of China-Europe trains used the Kazakhstan corridor, 11% the Mongolian corridor and 9% the northern TSR corridor in 2018.

⁷ See <https://www.silkroadsummit.eu/news>.

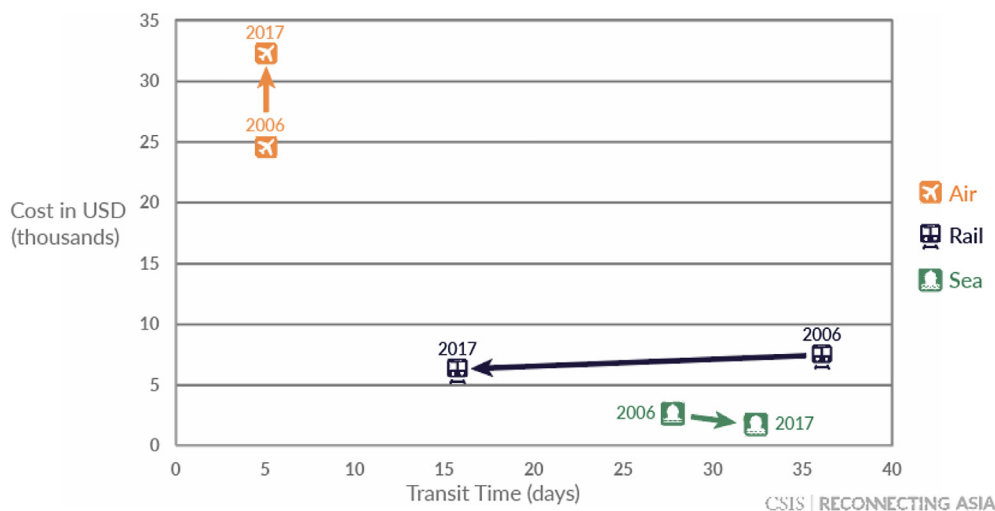


Fig. 1. Time and Cost of Shipping a FEU (40-foot equivalent unit) Container from Shanghai to Hamburg by Air, Rail and Sea, 2006 and 2017. Source: Hillman (2018), redrafted from Zhang (2017). Note: based on data in Land Transport Options between Europe and Asia: Commercial Feasibility Study, U.S. Chamber of Commerce, Washington DC, 2006. and in Zhang (2017 – reported in Schramm and Zhang, 2018, and Zhang and Schramm, 2020).

Table 2

Comparison of Shipping Cost, in USD per container, and Time, in days, for Goods transported between China and Europe.

	Shanghai-Gdynia		Chengdu-Warsaw		Shanghai-Rotterdam	
	Cost	Time	Cost	Time	Cost	Time
Air	37,000	5–9	37,000	5–9	37,000	5–9
Rail	4,500	19	5,000	15	5,000	18
Sea	2,600	37–42	4,500	43–50	2,200	27–37

Source: Jakóbowski et al., 2018, 69.

Table 3

Volume of Traffic on China-EU-China Container Trains, 2015–20.

Year	Number of twenty-foot equivalent containers (TEUs)
2015	46,000
2016	100,500
2017	175,800
2018	280,500
2019	333,000
2020	546,900

Source: UTLC website at www.utlc.com (accessed 5 April 2021).

ity via Russia to China has always had a strategic dimension and EU Commission policy is within the framework of the European Union Global Strategy (2016).

For China, the rail Landbridge has been related to President Xi’s flagship foreign policy, the Belt and Road Initiative (BRI), that was announced in 2013 and officially launched in May 2017. However, the first trains preceded the BRI, and much of the activity has been driven by local governments in China rather than at the national level. To encourage freight trains from their city, local authorities have offered substantial subsidies that are difficult to document with any precision. Many sources cite the numbers from 2014 in Besharati et al (2017, 28) that range from zero to \$7,000 per container; commenting on the large range, Besharati et al observed that the willingness to give subsidies was lower in coastal provinces such as Jiangsu or Zhejiang and higher in inland provinces (highest in Zhengzhou in Henan province). Feng et al. (2020) survey the literature and provide the most recent estimates for four routes (Table 4); the subsidy is between 51% and 78% of the quoted freight rate.

Table 4

Subsidy of China Railway Express Routes, per forty-foot equivalent container.

Routes	Distance (km)	Freight Rate (USD/FEU)	Subsidy (USD/FEU)
Chongqing–Duisburg (Germany)	11,179	10,200	6400
Zhengzhou–Hamburg (Germany)	10,214	9,500	7400
Wuhan–Pardubice (Czech)	10,100	11,000	5600
Chengdu–Łódź (Poland)	9,826	10,600	7000

Source: Feng et al. (2020, Table 1).

The central government has imposed a cap of 30% on subsidies in 2020 (Chu, 2019) and the subsidies are eventually to be discontinued (Jakóbowski et al., 25, 2018; Pepe, 20, 2020). Given the non-transparency, it is difficult to estimate the impact of terminating subsidies. The number of routes will fall, e.g the Harbin-Hamburg service was discontinued after subsidies were removed (EUCCC, 2020, 19), and Chinese termini will be concentrated in fewer hubs, whose services will continue to be profitable.

3. Prospects

Improved connectivity will intensify the economic links between EU members and China. Although routes along the Landbridge are currently point-to-point, the prospects for economic development in countries along the route (e.g. Central Asia) are good, and this would strengthen those countries’ economic links to the EU. There are also prospects for physical reintegration of a geographically regionalized Eurasian continent, as Iran and Southeast Asia are brought into the rail

network.⁸ Such developments are often situated within China's Belt and Road Initiative as a political challenge, but it is important to recognize the solid economic foundations, as rail offers a competitive service in terms of reliability that is faster than sea and cheaper than air. The development of alternative rail routes is potentially important for maritime countries such as Australia because Indian Ocean ports (Bandar Abbas, Chabahar, Gwadar) and many Southeast Asian ports are linked to the Eurasian rail network.

Central Asian links are primarily through Kazakhstan to Russia and Europe (Pomfret, 2019c, 266-71). Kazakhstan is also the bridge from China via Turkmenistan to Iran and for transit to Uzbekistan, e.g. the Korea-Lianyungang-Tashkent service that goes on to the GM factory (ex-Daewoo) in Andijan. Kazakhstan was an early BRI partner, linking its own *Nurly Zhol* infrastructure program to the BRI. The *Nurly Zhol* programme for 2015–19 was announced in 2014; 3,000 km of national roads were built and reconstructed, 15,000 km of regional and district roads repaired, 1,400 km of new railways commissioned, six airport runways modernised, the capacity of Kazakh-Chinese border terminals increased to 40 million tonnes per year and the capacity of the port infrastructure on the Caspian Sea increased from 17.5 million to 27 million tonnes per year (Yergaliyeva, 2019).⁹

Under the TRACECA program, the EU has promoted a route from Central Asia across the Caspian Sea to Baku and then by rail through Azerbaijan and Georgia to the Black Sea and ship to Europe since the early 1990 s. Despite support from Azerbaijan and Kazakhstan, the route attracted little China-EU freight due to the inconvenience of transferring containers from train to ship and back to train, twice. The attractiveness of the Trans-Caspian route was improved by completion of the Zhezkazgan-Beyneu railway in 2014, reducing the east–west rail journey across Kazakhstan, and of the Baku-Tiflis-Kars (BTK) railway, which became operational in November 2017 and provided an overland link from Azerbaijan to Turkey, as well as by upgrading port facilities at Aktau and Turkmenbashi and the new Alyat port in Azerbaijan. Services between Venlo in the Netherlands and Xian were launched in November 2018. The first China-Turkey train from Xian in November 2019 used the BTK and crossed under the Bosphorus by the Marmaray Tunnel (Pepe, 2020, 29) before continuing to Prague.¹⁰

The rail link between Kazakhstan and Turkmenistan, formally opened by the two presidents in 2013, offered a new connection to Iran. After UN sanctions on Iran were eased in January 2016, the first train from China reached Tehran in February and China subsequently established regular services from Ningxia Autonomous region (home to Muslim minorities) and Yiwu to Iran.¹¹ The circuitous route for these services through Kazakhstan and Turkmenistan reflected the decision to avoid the more direct route through Uzbekistan which imposed more burdensome requirements on transit traffic.

Since Mirziyoyev was elected president in December 2016, Uzbekistan has become keen to repair the fractured relations with neighbouring countries and adopted more open economic policies. Apart from increasing its transit role on the more direct China-Kazakhstan-

Uzbekistan-Turkmenistan-Iran route, Uzbekistan supports China's proposal to construct a rail link from Kashi in China via the Kyrgyz Republic to Uzbekistan. The link would shorten the route from China to Iran and the Middle East and reduce China's dependence on transiting Kazakhstan.¹² The Kyrgyz government is concerned that the most direct Kashi-Andijan route, which passes through sparsely populated territory, will bring little benefit to the country and its construction may lead to debt dependence if funded by Chinese loans (Hurley et al, 2018; Pomfret, 79-83, 2020).

The Southeast Asian countries have envisaged that the Master Plan of ASEAN Connectivity will be consistent with the BRI and will benefit from financing from the Asian Infrastructure Investment Bank.¹³ Most obviously, the Singapore-Bangkok-Kunming rail link would connect the Chinese rail network to major ocean ports. Construction of railways from China to ports in Myanmar will similarly strengthen these infrastructure links. In all cases, however, progress has been slow as resistance to Chinese-funded infrastructure investment has been encountered in transit countries (e.g. Malaysia) as well as in least-developed ASEAN countries (Myanmar and Laos).

In Northeast Asia, Korea and Japan have connectivity programs (Korea's 2013 Eurasia Initiative and 2015 Eurasia Express rail project) or partnerships (the EU-Japan Connectivity Partnership announced in September 2019) that potentially involve improved transport links to the EU, although they are light on details and it is unclear whether they are intended to be complementary or competitive to the BRI.¹⁴ Korea's direct rail link to Europe passes over a rail bridge in the sliver of Korean territory at the mouth of the Tumen River and then joins Russia's TransSiberian railway. There is also a sea-rail connection via Lianyungang

Further expansion of the Landbridge traffic is tied to ongoing willingness of the EU, China and transit countries to continue to facilitate the international rail service. The current mainlines through Kazakhstan, Russia and Belarus work well for Łódź or Duisburg, but for Slovakia or Hungary faster routes via Ukraine have been constrained by the state of Russia-Ukraine relations. However, in May and June 2020 trial runs were undertaken from China to Kyiv both avoiding and transiting Russia; the former was from Yantai to Kyiv via the Aktau-Baku Caspian Sea crossing and the Black Sea crossing from Georgia to Ukraine, and the latter was from Wuhan to Kyiv via an overland route through Russia. Development of a southern route via Iran and Turkey could be even better for South-eastern Europe.¹⁵

Alternative routes also improve rail's attractiveness by reducing the potential for disruption by a transit country. Any route can be disrupted by a single non-cooperating transit country whether seeking higher transit fees or in political dispute, although transit countries have strong financial incentives not to be disruptive in order to earn the transit fees.¹⁶ Competition can also encourage countries to ease bottlenecks; the change-of-gauge transfer point at the Belarus-Poland border is a major source of delay for trains on the main Landbridge

⁸ Prospects for overland connections with South Asia are limited by geography and by political disagreements. Pakistan is being linked to China via the China-Pakistan Economic Corridor but the geographical challenges of crossing the Himalayas are substantial. Poor India-Pakistan relations and the security situation in Afghanistan inhibit east–west links through South Asia.

⁹ The *Nurly Zhol* programme has been extended to 2020–25. See also, Belgibayev & Zhang (2016).

¹⁰ The *Daily Sabah*, 27 October 2019, reported that the China-Turkey service would run with 42 containers once a week; <https://www.dailysabah.com/business/2019/10/27/two-years-on-baku-tbilisi-kars-railway-line-carries-275000-tons-of-freight>. However, as a China-EU route, the Middle Corridor still involves shipping across the Caspian and delays on the Turkish system, especially around Ankara, or on poorly served Black Sea ferry routes.

¹¹ So far, no trains from China have gone beyond Tehran. Although the track exists to Istanbul and the tunnel eliminates need for inter-modal transfers across the Bosphorus, many parts of the Iran-Turkey rail journey are slow, including a four-hour ferry across Lake Van in eastern Turkey.

¹² In a World Bank project on the impact of the BRI, this link has very large benefits (Bird et al., 2020), but the World Bank project does not account for construction costs.

¹³ At the 22nd ASEAN-China Summit in Bangkok on 3 November 2019, the heads of government of the ten ASEAN countries and China reaffirmed their commitment to synergise the Master Plan on ASEAN Connectivity (MPAC 2025) and the Belt and Road Initiative.

¹⁴ Schultze (2019) argues that the September 2019 EU-Japan Partnership on Sustainable Connectivity and Quality Infrastructure represents a strategic reaction to the BRI rather than containing any concrete measures to improve connectivity.

¹⁵ Some Western European countries have been concerned about growing Chinese influence in Eastern Europe, e.g. under the 17+1 (now 18+1) Initiative, in part due to fears of lost exports to Eastern Europe due to Chinese competition (Pomfret, 2021, 153-5). Stanojevic et al. (2020) find that Chinese exports to Eastern Europe in 2006–17 were complementary to EU members' exports of machinery and electronics (i.e. sectors characterized by GVCs) but competitive in finished goods such as textiles or furniture.

¹⁶ According to an Asian Development Bank source, Kazakhstan earned over one billion US dollars in transit fees in 2015 (Pomfret, 2019c, 267). Despite poor EU-Russia political relations after 2014, cooperation on the Landbridge was undiminished (Table 3).

routes, largely due to managerial rather than infrastructure problems (van Leijen, 2018; Lobyrev, et al., 2018); development of alternative routes through Lithuania to Klapeida or Kaliningrad and then by ship to German ports puts pressure on Poland to improve its facilities.¹⁷

Looking further ahead the prospect of a high-speed China-EU rail link is not implausible given the speed with which China's domestic high-speed rail link has been developed and the generally favourable terrain through which Landbridge routes pass. China's first high speed rail (HSR) service on dedicated track opened in 2008 between Beijing and Tianjin, in time for the Olympic Games; by the end of 2019 the HSR network covered 35,000 kms.¹⁸ Such a link would further improve the time advantage that rail offers over sea freight from China to Europe.

4. Implications

Economic prospects for continued development of the Eurasian Landbridge are positive. The rail option is attractive to traders with high-value goods for which the savings in time-in-transit over maritime transport and more assured delivery times justify paying a higher price. If the price gap can be further reduced by efficiency gains and by scaling-up and travel times can be further reduced, then the relative attractiveness of rail freight will increase. Improved connectivity will strengthen economic links between Europe and China (and potentially intermediate countries too).

This process is likely to be linked to the phenomenon of lengthening supply chains. Market integration has been a driving force of long-term economic development as local markets and production processes become regional and then national and international. The creation of international value chains relies on low costs of international trade and reliable delivery times to reduce the need for inventories at each production stage. The phenomenon of global value chains (GVCs) has been a feature of the international economy since the mid-1980 s (Baldwin, 2016; Johnson & Noguera, 2017; UNIDO, 2018), initially identified with electronics, automobile and clothing production but now characterizing many goods and services.

The initial drivers of the Landbridge were GVC lead-firms. European carmakers sent components to their assembly plant in China, while companies like Apple, HP and Acer shipped electronic goods from factories in China to their marketing and distribution centres in Europe. These were items that were too heavy to airfreight but too valuable to have in transit on a ship for over a month; rail provided a mix of speed and reliability for which the carmakers and electronics firms were willing to pay a premium over maritime freight rates

The GVC phenomenon observed since the 1980 s has rarely included truly global value chains but rather involved three main regional value chains centred on East Asia, Europe and North America. The Landbridge has been instrumental in the creation of Eurasian value chains with EU carmakers sending components to their Chinese assembly plant and electronics firms sending assembled products from China to their EU marketing centres. This matters because GVC trade links economies more tightly than arms-length trade between independent exporters and importers.

¹⁷ Lithuania's rail gauge is the same as that of Russia and Belarus, removing the need for change of gauge. See the report on Lithuania's role in the Landbridge posted on 8 January 2021 at <https://www.railfreight.com/beltandroad/2021/01/08/this-where-2020-has-got-lithuania-on-the-international-railway-map/>

¹⁸ HSR is typically defined as passenger trains running between 250 and 350 kph and freight trains at speeds over 200 kph. In 2019, China began testing maglev trains that can run at speeds of 600 kph; the only current maglev service, from Shanghai city centre to Pudong airport, reaches speeds over 400 kph and covers the 30.5 km journey in just over seven minutes. Although reporting and analysis of Chinese HSR focuses on passenger traffic (e.g. Lawrence, Bullock, & Liu, 2019), many lines along the "eight vertical and eight horizontal" corridors are passenger/freight lines.

5. Conclusions

The Eurasian Landbridge has contributed to increased sustainable connectivity between the EU and China during the decade of the 2010 s. Felicitously, this market-driven development preceded, and also complemented, major foreign economic policy announcements by the Chinese President (the Silk Road Economic Belt and BRI) and by the European Commission (*Connecting Europe and Asia*) and reinforces their goal of increased connectivity. The resulting connectivity is likely to survive bilateral political deadlocks because the economic foundation is strong.

In 2020, the COVID-19 pandemic seriously disrupted international maritime trade and air transport.¹⁹ Even as lockdowns were eased and factories started up, containers and ships were out of location as managers dealt with crew safety issues and dockside biosecurity. Rail transport was less affected, and acceleration of digitalization and paperless trade may even have improved the efficiency of rail transport across multiple borders. Manufacturers, distributors and logistics agents, who had previously relied upon maritime transport between East Asia and Europe, turned to overland freight routes. Although initially disruptive for many operators, the overland alternatives often turned out to be easier and more profitable than anticipated as users experienced reliable delivery schedules, at a time when the air freight alternatives had become increasingly expensive. In May 2020, at the height of the crisis in Europe, 52,500 TEU were shipped on the Landbridge, the highest ever figure for a single month.²⁰ Despite the global disruption due to COVID-19, the amount of freight transported along the rail Landbridge in 2020 was almost 65% greater than in 2019 (Table 3).

The rail services are consistent with EU and Chinese hopes for improved connectivity, reflected in major foreign economic policy announcements by the Chinese President (*The Belt and Road Initiative*) and by the European Commission (*Connecting Europe and Asia*). This paper has argued that the overland connectivity is sustainable because the economic foundations are strong. Looking further ahead the prospect of a high-speed rail link is not implausible, and it would further strengthen the attractiveness of *trans*-Eurasian rail transport.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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¹⁹ In a review of the trade facilitation impact of COVID-19 on trade in Russia, Central Asia and the Caucasus, Vassilevskaya (2020) notes that air freight essentially stopped and transport by road was disrupted by requirements for drivers to be tested for COVID at border crossing points, disinfectant procedures and other regulations.

²⁰ This paragraph draws on a report <https://www.railfreight.com/business/2020/08/20/new-silk-road-work-practices-are-a-success-story/> posted on 20 August 2020.

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