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Mask Wars: Sourcing a Critical Medical Product from China in Times of COVID-19

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Abstract

The COVID-19 outbreak suddenly heightened the global demand for critical medical goods while initially reducing China's supply of those same goods. This article studies the political factors that facilitated access to Chinese face masks during the initial months of the global pandemic. We use a (triple) difference-in-differences framework and compare export dynamics of face masks with other goods within the same product group and non-critical medical goods as controls. Our results show that political alignment at the national level and subnational political ties with Chinese provinces helped rapidly expand Chinese exports of face masks to trade partner countries. We also find that countries with more sister ties with Chinese subnational jurisdictions paid significantly less for face masks. Analyzing the underlying mechanisms, we find that close political ties helped create new trade links and that the lower-level sister ties were pivotal in mitigating price increases.

JEL Codes: F14, F59, H12, H77, H84, I18, P33

Keywords: strategic exports, COVID-19, health crisis management, medical equipment, face masks, diplomatic relations, emergency relief

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"America first" will not help us to cope with this crisis. [...] The protective materials available here are currently only sufficient for a few days. [...] I therefore ask the People's Republic of China for support.

Stephan Pusch, Administrator of Heinsberg District, Germany, in an open letter to China's President Xi Jinping, March 23, 2020 (own translation)

1 Introduction

With the outbreak of the coronavirus (COVID-19) pandemic in March 2020, the demand for critical medical equipment skyrocketed and outstripped the global supply. The global health crisis suddenly transformed simple medical products, like face masks, into scarce goods.[1] Countries, provinces, companies, hospitals, and individuals started competing for these lifesaving goods, sometimes using questionable means. For example, newspapers reported on April 4th, 2020, that the United States had "confiscated" masks intended for the German capital of Berlin at Suvarnabhumi Airport in Bangkok, Thailand, and diverted them to the United States. In response to these events, Berlin's Senator for Interior spoke of an "act of modern piracy" and demanded that "even in times of global crisis there should be no wild west methods" (The Guardian 2020a). This was everything but an isolated incident. The Guardian (2020b) reported on April 3rd, 2020, that "US buyers waving wads of cash [had] managed to wrest control of a consignment of masks as it was about to be dispatched from China to one of the worst-hit coronavirus areas of France." Tensions also mounted within countries. For example, the French Interior Minister Christophe Castaner called the situation within France a *guerre de masques*—a mask war between the local authorities and the state (Le Monde 2020).

China played a central role in these "mask wars" as the world's largest supplier of these critical medical supplies. According to pre-pandemic data for 2019 (UN Comtrade 2020), 47% of the world's exports of face masks originated in China. In contrast, the next largest exporters, Germany (7%) and the United States (6%), played a comparatively minor role. However, while the global demand for face masks from China surged during the pandemic's outbreak in March 2020, China's supply had broken down due to the pandemic's economic shutdown. China itself ran short of medical equipment and was dependent

[1] Face masks have been shown to mitigate the spread of COVID-19 (Mitze et al. 2020, Chernozhukov et al. 2021). In the week beginning on March 15th, 2020, the global search interest in the topic "masks" outnumbered the interest in otherwise popular topics like "food" and "soccer," according to Google Trends (own query for the past five years on `https://trends.google.com` on October 24, 2022).

on imports in February 2020, when the virus was still mainly contained within Chinese borders.[2] The European Commission limited its exports of medical equipment in mid-March 2020, which was interpreted as a reaction to uncertainty about Europe's access to medical supplies from China (Bown 2020). This restriction resulted in fierce competition between countries over Chinese medical goods (Evenett 2020).

The significant increase in demand combined with a constrained supply resulted in a steep increase in mask prices in April and May 2020, as visualized in Figure 1. This price increase is indicative of extreme shortages during the first months of the global pandemic and confirms previous evidence on the large profit margins for producers during pandemics (Harrington and Hsu 2010).

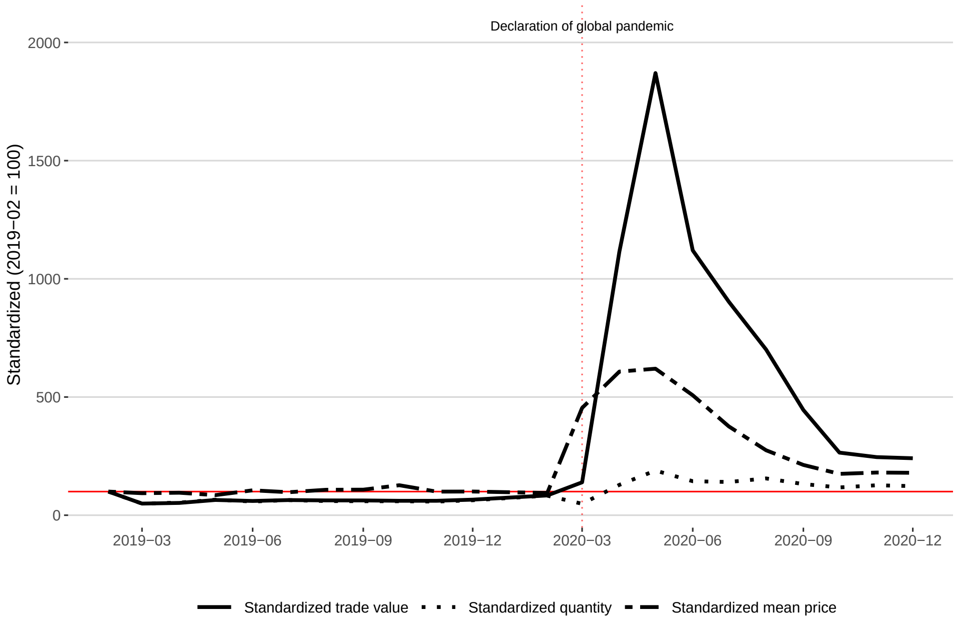


Figure 1: Trade value, quantity, and price of China's face mask exports between January 2019 and December 2020 (January 2019=100)
Notes: The figure shows monthly trade value, quantity, and mean price of China's exports of face masks between January 2019 and December 2020. All three series are standardized to 100 at their January–February 2019 level. As the China Customs statistics database reports export data in January and February 2020 together, we sum up exports in January and February 2019 to keep consistency. The dashed vertical line indicates the declaration of the global pandemic by the WHO in March 2020. Data on export value and price (in US$) and quantity (in kg) are obtained from the China Customs statistics database (GACC 2020b).

In this paper, we argue that close political relations helped countries source face masks from China in this competitive environment. The basic gravity model of international trade suggests that China should export more goods to economically larger and geographically closer countries. But it is not a priori evident that these are the primary factors that will drive the expansion of trade linkages when there is a sharp increase in global demand. Differences in the early severity of the coronavirus outbreak across countries should have also resulted in differences in the countries' demand for face masks and willingness to pay for them. Additionally, we expect that political ties at national and subnational levels

[2]China's production of face masks had been halved to ten million per day in early February 2020. A spokeswoman from China's Ministry of Foreign Affairs summarized the situation as: "What China urgently needs at present are medical masks, protective suits[,] and safety goggles" (BBC 2020).

helped reduce the costs of finding new suppliers or expanding existing supplies and thus facilitated the sourcing of critical medical goods, such as face masks. On the one hand, we expect that the state of international political relations at the national level shapes China's export patterns of critical products and has contributed to the expansion of exports. Beijing has a track record of using trade to pursue its foreign policy goals (Fuchs and Klann 2013, Du et al. 2017, Didier 2018). We, therefore, analyze the extent to which the expansion of China's exports of face masks was linked to measures of national-level political relations with its trade partner countries. On the other hand, previous decentralization efforts (e.g., Jin et al. 2005) strengthen the expectation that subnational political ties also play a substantial role in trade. Since China's gradual opening up after 1978, local governments have become part of the People's Republic's multi-layered foreign politics (Junbo et al. 2010). In this process of "localizing foreign policy" (Hocking 1993), local governments have to abide by policy guidance of the respective national ministries, but take important functions in low politics, such as foreign trade. For this purpose, provinces have developed various instruments, including city events, sister city ties, aid donations, provincial trade delegations, and the hosting of foreign diplomatic missions (Junbo et al. 2010).

To test whether political relationships foster trade expansion in critical situations, we analyze China's export pattern of face masks using monthly dyadic trade data from the General Administration of Customs of the People's Republic of China (GACC 2020b), published at the level of pairs of Chinese provinces and partner countries. Our empirical strategy is based on a difference-in-differences (DiD) approach that compares the variation in the value, quantity, and mean price of monthly exports of face masks (measured at the 8-digit level of the Harmonized System (HS)) to those of two different kinds of control products (other made-up textile products and non-critical medical products) before and after the pandemic outbreak. Dynamic estimates of monthly treatment effects from 2019–2020 help establish that the exports of face masks and their control products followed parallel trends before the pandemic outbreak; hence, our DiD results show a causal relationship. In our subsequent analyses, we focus on the months of April–June 2020, the first three months in which the COVID-19 outbreak was considered a global pandemic, and thus global competition over Chinese medical supplies was particularly fierce, and compare them to the same three months of the previous year.[3] We implement a triple difference strategy to test whether political relations, proxied by voting alignment within the General Assembly of the United Nations (UN), local diplomatic missions, and sister linkages at the province level and below, facilitated the sourcing of face masks as expressed in China's export pattern.

Our results show a large increase in the value of face mask exports from China during the global pandemic outbreak, which arose due to extreme price hikes and the expansion of exported quantities in comparison to control products. The triple difference specifications confirm our expectations: close bilateral political ties at both national and subnational level facilitated the growth of the exported

[3]The World Health Organization (WHO) declared a global pandemic on March 11, 2020. The average price for a Chinese-exported face mask was largest in the three subsequent months (see again Figure 1).

amount of face masks. The presence of a country's diplomatic representation within a province and sister linkages between subnational entities contributed more specifically to establishing new trade links, connecting provinces to countries that did not import masks from them during the previous year. Sister linkages between lower-level administrative entities (like cities) even contributed to lowering face mask prices, possibly reflecting the presence of interpersonal connections. In general, political ties played a more relevant role in the expansion of the mask trade than linkages through past trade or foreign direct investment (FDI), or the presence of trade agreements. While there is some indication that national political alignment played a more prominent role in provinces with a larger influence of central state-owned enterprises (SOEs), it cannot explain the trade-creating effects of subnational links. This suggests that local officials tended to follow their own agenda for specific countries rather than only following national guidelines.

Our paper builds on previous research in economics and political science that discusses the extent to which political relations matter for international commerce (Hirschman 1945, Baldwin 1985, Berger et al. 2013, Rose 2019, Crozet and Hinz 2020). In a seminal contribution, Pollins (1989) develops a public-choice model in which importers reward political friends through trade increases and punish adversaries through trade reductions. A subsequent stream of research documents that diplomatic relations, as operationalized by embassies and state visits, among others, can foster bilateral trade (Nitsch 2007a,b, Rose 2007).[4] While interlinked supply chains, bilateral, and multilateral trade agreements could prevent governments from politicizing trade due to sunk costs (Davis and Meunier 2011), persistent government control over economic activities may explain why Chinese trade still 'follows the flag' (Davis et al. 2019). Notably, economic diplomacy facilitates trade in emerging economies like China, where the "government is still regarded as a natural partner in the economy" (Moons and van Bergeijk 2017) and many business decisions need government approval. Consumer reactions to the state of bilateral relations are another mechanism through which politics affects commerce (Pandya and Venkatesan 2016).

Recent empirical evidence indeed suggests that Chinese trade has remained politicized in the aftermath of bilateral tensions (Du et al. 2017). Political tensions caused by governments receiving the Dalai Lama led to reductions of their countries' exports to China (Fuchs and Klann 2013), which appear to mainly operate through SOEs (Lin et al. 2019). These companies not only have to follow government objectives by their very definition, but they are also financially dependent on the government and show a large overlap in terms of the staffing of their leadership (Davis et al. 2019). Various episodes of Sino-Japanese tensions also led to substantial declines in Chinese imports from Japan (Fisman et al. 2014, Heilmann 2016). We contribute to the literature as we study the relationship between international politics and trade in the realm of global health.

Our paper is the first quantitative study on the role of politics in Chinese exports of critical medical goods during the COVID-19 pandemic. In light of the emerging literature that highlights the importance

[4] See Moons and van Bergeijk (2017) for a meta-analysis on the trade effects of economic diplomacy.

of subnational decision-makers for Chinese domestic politics (Zhang and Van Witteloostuijn 2004, Chen and Kung 2019, Ye 2021), we advance previous analyses of the trade-politics nexus by considering province-level ties. We thus also contribute to the broader literature on the politics-trade nexus as we analyze the effects of contemporaneous international political relations on trade at the *subnational* level. While Che et al. (2015) also analyze political factors in Chinese trade at the provincial level, they focus on political tensions rooted in history. They find that Chinese provinces that suffered more casualties during the Japanese invasion from 1937 to 1945 traded less with Japan in 2001. In contrast, our paper focuses on contemporaneous political ties and investigates friendly relations, such as diplomatic representation and sister linkages at the subnational level.

We proceed as follows. Section 2 discusses how political relations can facilitate the sourcing of a good that suddenly became a critical medical good during a pandemic. In Section 3, we present our measures of trade flows and bilateral political ties. Section 4 documents an event study of the impact of COVID-19 on Chinese exports of face masks. In Section 5, we estimate the causal effects of political relations on exports of face masks in a triple difference setting. We conclude in Section 6.

2 The role of political relationships in trade during a pandemic

The economic gravity framework (Anderson and Van Wincoop 2003, Arkolakis et al. 2012, Head and Mayer 2014) postulates that international trade increases with the economic size of trading partners and with a series of factors that lower the costs of trade. Trade costs in this setting are not only related to physical distance, but they also decrease with common language (Melitz and Toubal 2014), cultural similarity (Guiso et al. 2009), institutional quality (Anderson and Marcouiller 2002), existing preferential trade agreements (Baier and Bergstrand 2007, Egger et al. 2011), as well as other cross-country linkages that reduce information barriers and make the establishment of new trade ties easier (Volpe Martincus et al. 2010).

Our analysis deviates from the classical gravity framework as we only observe exports from China, the country that was the dominant producer of face masks before the pandemic outbreak. Moreover, we do not consider only Chinese exports as a whole but also observe how each Chinese province expanded its exports of coveted face masks in comparison with similar products. In another deviation from the classical gravity framework, we augment the model with variables that proxy for the demand for face masks (COVID-19 exposure) and political ties to China and its provinces. While traditional gravity variables may still explain a lot of the variation in trade even in times of crisis, we focus on political linkages in this paper. Given the politicization of trade, the sway that the Chinese government has over the economy, and the Chinese government's efforts to turn mask deliveries into a project of national prestige, it is likely that political ties with China—both at the national and the subnational level—mattered for successfully sourcing medical goods from China during the pandemic.

National-level political alignment: The Chinese central government plays a key role in formulating China's foreign economic policy. It does so by outlining the overarching economic priorities in Five-Year Plans, devising specific economic policies like the 'Going Out' strategy, or issuing concrete guidance, such as official investment directives. It also engages in economic diplomacy, signing trade agreements, paying bilateral diplomatic visits to other countries to promote trade, and setting up regional economic forums (Strüver 2016, Stone et al. 2022).

Political relations with China at the national level have been shown to affect trade. China has a track record of reducing imports to punish unwanted diplomatic behavior and as a reaction to political tensions more generally, especially through its SOEs (Fuchs and Klann 2013, Du et al. 2017, Davis et al. 2019, Lin et al. 2019). Allowing consumer boycotts is another way to inflict economic pain on a trading partner by reducing imports (Heilmann 2016). In a setting of international diplomatic tensions, Weiss (2013) shows that the Chinese government managed nationalistic sentiment (that may result in consumer boycotts) depending on its diplomatic incentives. Conversely, good political relations with China may pay off for its trading partners. For example, China used SOEs to channel foreign direct investment (FDI) to aligned countries (Stone et al. 2022).

Relative to other countries, China's national government has even more means to direct China's economic behavior abroad due to the tight integration of the (party-)state and the economy. The most prominent vehicle representing this type of "state capitalism" are centrally-administered SOEs. Centrally-administered SOEs play an important role in the Chinese economy and respond strongly to national-level politics (Du et al. 2017, Huang et al. 2017, Davis et al. 2019). SOEs could be directly requested to increase their production and sales of face masks to politically allied countries or do so in anticipation of national policy. In fact, SOEs contributed to the steep increase in face mask production during the pandemic, e.g., by repurposing their established assembly lines (López-Gómez et al. 2020).

National-level ties may have mattered particularly during the pandemic, during which China directed masks towards countries supporting Beijing with "sensitive votes in multilateral forums or international organizations, such as the European Union or the United Nations" (MERICS 2020). A report issued by the US Congress states that politically more aligned trading partners received prioritized supply of critical medical equipment from China and points to the persisting tensions in the China-US trade relations as a reason for shortages of personal protective equipment at the outbreak of the pandemic in the United States (CRS 2020).

Political ties with subnational units: Chinese local governments do not officially play a role in shaping China's international diplomatic relations. However, the central government does encourage local governments to build relationships with countries and local governments abroad to complement national foreign policy (Liu and Song 2020). Since China started the decentralizing process in 1978, local governments developed their own foreign affairs and commerce bureaus and now "engage in 'paradiplomacy,' striking deals with foreign governments as far afield as Africa" (Jones and Hameiri 2021, p. 32). The Chinese president Xi Jinping himself embraced their role at a meeting of the Chinese Association for Friendship with Foreign Countries in 2014: "[We] must vigorously carry out China's international sister city work [and] promote exchanges between Chinese and foreign local governments" (Xi 2014). Specifically, local governments engage in fostering cultural and economic exchanges, social interaction, and investments (Mierzejewski 2020). They may set up sister ties, sign non-treaty agreements or participate in national delegations (Liu and Song 2020). By forming personal bonds with people abroad, they are expected to "tell China's story well and show the world a real China, a three-dimensional China, a comprehensive China" (Xi 2014).

From the perspective of the central government, this multi-layered approach has two benefits. First, local governments and the personal bonds they maintain might be best suited to implement national policy. Second, local governments can keep a backdoor open for policy reversals and re-engagement with political adversaries. By allowing them to act in a way that is seemingly at odds with national policy, the central government benefits from a higher degree of political flexibility. For example, during the COVID-19 pandemic, local governments promoted a benevolent image of China through donations of medical goods, including face masks, while the central government faced the blame for its handling of the initial outbreak. Local governments also played a key role in the promotion of the Health Silk Road (Mierzejewski et al. 2021).

The behavior of local governments, however, is not always aligned with national policy. The central government's authority over local governments is limited and their economic incentives often differ. In a "fragmented China," local governments often act with "little understanding of or regard for China's wider foreign policy objectives or the diplomatic context" (Jones and Hameiri 2021, 32). Another factor inhibiting the vertical alignment of national policy and the activities of local entities is that they themselves are heterogeneous, consisting of various administrative layers and (potentially competing) government agencies (Junbo et al. 2010). Though not enshrined in the Chinese constitution, provincial governments have "considerable manoeuvring space [...] to bargain, lobby and alter the centre's foreign policy, even within the institutional bounds of the top-down political system" (Wong 2018, 753). The strategies of Chinese provinces include lobbying for their own interests, setting precedents, impeding policy implementation or outright resisting it ("trailblazing, carpetbagging, and resisting," Wong 2018, 735). Thus, local governments in China might be aptly described as "semi-independent actors in China's foreign relations" (Li 2014, 292).

In this paper, we investigate the "paradiplomacy" of Chinese provinces, whether aligned with or running counter to national policy. We do so by exploiting linkages between Chinese provinces and countries abroad, namely the presence of diplomatic representations and sister linkages. At the beginning of the pandemic, countries could have been more successful at sourcing face masks from provinces where they maintain a diplomatic mission. In a cross-country setting, Rose (2007) shows that each additional consulate in a partner country increases exports between 6 to 10 percent and the empirical literature at large confirms a positive effect of additional consulates on trade (van Bergeijk et al. 2011, Plouffe and van der Sterren 2016, Moons and van Bergeijk 2017). Foreign consulates in Chinese provinces have been argued to facilitate the objectives of the Belt and Road Initiative (Mierzejewski 2020). The Uruguay consulate in Chongqing, for example, after its opening in 2019, was instrumental in attracting aid goods from China during the COVID-19 pandemic (Telia and Urdinez 2022). When it comes to the hierarchy of diplomatic representations, the literature suggests that embassies play a more important role for trade than consulates (van Bergeijk et al. 2011).

While embassies and consulates are an obvious way to measure the strength of bilateral relations, less apparent linkages, such as sister city relations, may play an important and trade facilitating role as well. In his 2014 speech mentioned above, for example, China's president Xi Jinping emphasized the importance of sister city ties for economic policy specifically by invoking the term "city diplomacy" (*chengshi waijiao*) (Xi 2014). In the case of sister linkages, higher-level linkages between Chinese provinces (or comparable administrative entities) and foreign governments can be expected to be more closely aligned to national political interests, whereas lower-level linkages with cities and counties often build on much more decentralized, often personal, relationships.[5] Many sister relations have evolved from other issues, like education and culture, towards trade (Mascitelli and Chung 2008, Liu and Hu 2018). Thus, they measure bilateral relations in a broader sense than diplomatic missions, extending to personal bonds and communication channels between firms and through liaison offices. Arguably, such linkages can help build new trade ties more quickly when needed.

Anecdotal evidence suggests that sister relations have indeed been helpful to source medical equipment from China during the COVID-19 pandemic. Many Chinese provinces donated face masks to their respective sister entity, such as Fujian province to the US state of Oregon, or Hunan province to the UK county of Lincolnshire (People's Daily 2020, The Lincolnite 2020). Beyond donations, sister ties also facilitated commercial access to face masks from China. Two anecdotes from Germany illustrate this case. In April 2020, the small town of Rinteln in Northern Germany turned to its sister district Tongnan for help. The Tongnan municipal government swiftly mediated the procurement of face masks directly from Chinese producers, allowing Rinteln to buy 100,000 face masks at a price well below the German market price at the time (Gokl 2020). Similarly around the same time, the German town of Eutin made use of its personal bonds with Xinchang County to buy masks from China: "The fact that the city was able to order masks in China at all was based on the personal relationships established in October 2018 during a visit to Xinchang by a delegation of representatives from Eutin politics and administration" (Benthien 2020).

[5] Comparable administrative entities are 15 big cities that are ranked at the sub-provincial level, including 10 provincial capital cities and 5 other cities that have provincial-level authority over economic issues. See Online Appendix A for a full list.

3 Data and measures

3.1 Exports of face masks and comparison products

To study how Chinese bilateral exports reacted to the global shortage of critical medical products, we focus on face masks, which have become the most symbolic and most coveted medical product during the first months of the global COVID-19 pandemic. Our analysis relies on official monthly dyadic export data for pairs of Chinese provinces and trade partner countries, which are provided at the level of HS 8-digit codes by China Customs (GACC 2020b). Face masks are identified by the HS 8-digit code '63079000,' named "made-up articles, not else specified."[6] Between April–June 2019 and April–June 2020, the value of China's exports of face masks increased by about 19-fold due to substantial increases in prices and—with some delay—in quantities (see again Figure 1).

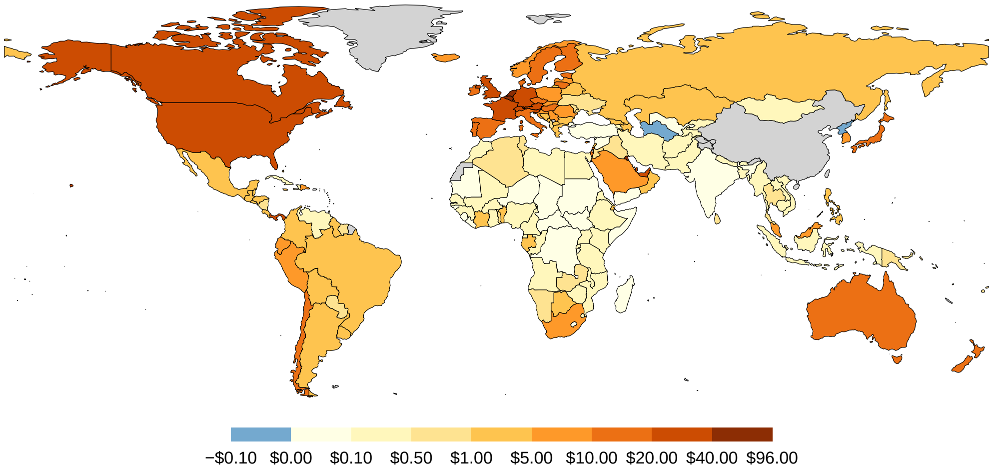


Figure 2: Change in per capita face masks exports between April–June 2019 and 2020 by partner country
Notes: The map shows the absolute *per capita* change in US$ of Chinese face masks exports by trade partner country for the months April, May, and June 2020 compared to the same months in 2019. Face masks are identified by the HS 8-digit China Customs code '63079000.' Data are taken from GACC (2020b).

Figure 2 shows that the value of Chinese face mask exports increased across almost all of its trade partners in the same time period.[7] The top importers include the largest economies, with the United States, Germany, and France leading the list in terms of total trade values and quantities (see Table C.1 in the online appendix). These countries are also among the most severely affected during the early phase of the pandemic. The average price of imported face masks increased substantially compared to 2019 for all countries, but the price increase varied across countries. Among the top-20 importers, Italy, which was severely affected by an early pandemic outbreak, sourced face masks for a 17-fold price in April–June 2020 as compared to the year before, whereas the average price paid by the United States increased 7-fold and 4-fold for South Korea.

[6]HS 8-digit code '63079000' includes two HS 10-digit codes: '6307900010' ("medical masks") and '6307900090' ("other made-up articles, not else specified").

[7]We see reductions in the imported value of face masks from China only for four trade partners: Kiribati, the Marshall Islands, North Korea, and Turkmenistan.

With respect to the source of exports, all Chinese provinces are home of face mask exporters. While all Chinese provinces exported at least some face masks both before and after the pandemic outbreak, Beijing and the coastal regions in the Southeast dominate the market as exporters. The largest exporter in the April–June 2020 period was Guangdong Province (25.3%). As can be seen from Figure 3, as compared to the same period of three months in the previous year, eight provinces expanded their exports of face masks by more than US$ 1 billion. Not surprisingly, the increases were the largest among the coastal provinces that are also considered China's economic powerhouses. At the same time, the regional sourcing of medical equipment became also more widely spread than one year before, arguably driven by subsidies and the re-purposing of state-owned enterprises (López-Gómez et al. 2020). Table C.2 in the online appendix reports the top-20 province-country pairs of face mask exports during the April–June period in 2019 and 2020. Consistent with the patterns shown in Figure 2 and Figure 3, face mask exports were predominantly from eastern coastal provinces (e.g., Guangdong, Zhejiang, and Jiangsu) to large economies including the United States, Germany, and France. Of the total of 5,952 province-country pairs, 1,400 did not have face mask exports in 2019 but did so in 2020. This suggests that the pandemic led to the creation of a significant number of new bilateral trade links, which we also investigate below.

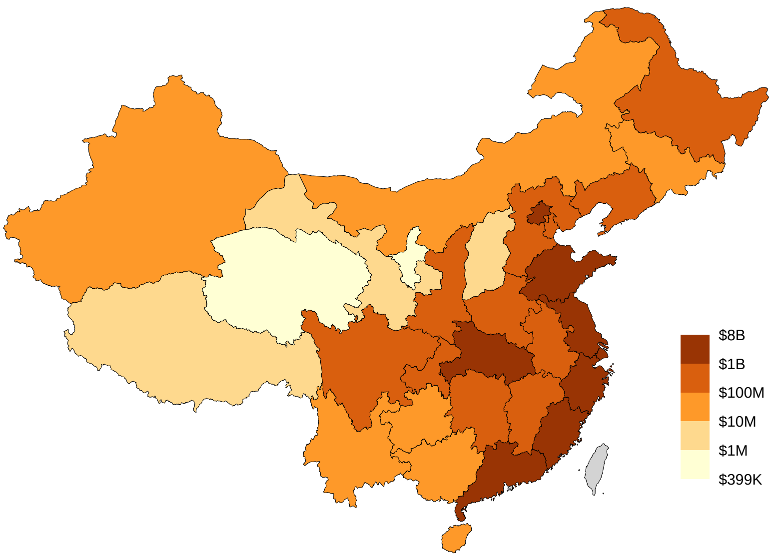


Figure 3: Change in face masks exports between April–June 2019 and 2020 by Chinese province
Notes: The map shows the absolute change in US$ of Chinese face masks exports by province for the months of April, May, and June 2020 compared to the same months in 2019. Face masks are identified by the HS 8-digit level (China Customs code '63079000).' Data are taken from GACC (2020b).

In our empirical analyses, we compare the export dynamics of face masks with those of two groups of control products, which were not equally affected by the global pandemic outbreak. The first control group consists of products that are comparable to face masks based on their production material and, hence, production technology: it contains all other textile products within the same HS 4-digit subchapter '6307' that consists of "other made-up articles, including dress patterns." There are two other products within this subchapter beyond face masks: “floor-cloths, dish-cloths, dusters and similar cleaning cloths” (‘63071000’) and “life-jackets and life-belts” (‘63072000’). As these items can be produced by very similar technologies, their pre-pandemic export patterns should be similar to those of face masks, but their global demand was not affected by the pandemic outbreak, offering a valid comparison group. However, focusing on a control group that contains relatively close substitutes from the production side might also create some drawbacks. If firms reacted to the excess global demand for face masks by product switching, moving from producing and selling control products to face masks, the pandemic outbreak would not only have led to additional face mask production and exports, but also to a reduction in the production (and exports) of close substitute products. This would result in an overestimation of the pandemic’s effect on mask exports. Even if this were the case, it is unlikely that this would bias our main, *triple* difference specification that we describe below. Nevertheless, we also present all results with an alternative control group.

This second, alternative control group consists of a wider set of products that are related to face masks in terms of usage—rather than their production technology. We compare the exports of face masks to those of other medical products. This deals with the concern that arises from possible product switching described above. However, for a valid comparison, we must ensure that demand for the medical products considered as controls was not itself significantly affected by the coronavirus outbreak. We address this issue by taking a product list of 310 medical products collected by Helble (2012), and measured at the HS 8-digit level, but excluding all medical products from this list that either the Chinese government or the World Trade Organization (WTO) deemed as ‘critical’ during the initial phase of the coronavirus pandemic.[8] This leaves us with 214 non-critical medical products exported by China in our control group, such as vitamins, dental instruments, and malaria diagnostic test kits (see Table C.12 in the online appendix for a full list of control products).

3.2 Political linkages and further controls

In order to test whether close national and subnational political relations facilitated the sourcing of face masks at the time of global shortages, we compute three measures of political linkages. At the national level, we measure the state of political relations with data on voting alignment in the UN General Assembly (Bailey et al. 2017). UN voting alignment is an established measure of country-level political linkages both in the economics and political science literature and is often used as a determinant of trade relationships (Alesina and Dollar 2000, Barro and Lee 2005, Dreher et al. 2008, Berger et al. 2013). Several studies establish a link between China’s trade pattern and its UN voting alignment with

[8]The list of medical products that were deemed essential by the Chinese government for controlling and treating COVID-19 consists of 10 further products in addition to face masks, including among others, disinfectants, ventilators, surgical caps, and thermometers (GACC 2020a). The list of WTO products includes 80 products measured at the HS 6-digit level, e.g., COVID-19 test kits, medical oxygen, and ultrasound machines (see WTO 2020). From the resulting list, we exclude four products that China did not export during April to June 2019 and 2020.

other countries (see, e.g., Flores-Macías and Kreps 2013, Davis et al. 2019). Our main measure of voting alignment is the variable *UN voting agree*, which is defined as the share of votes in the UN General Assembly for which another country agrees with China, i.e., both countries vote 'yes,' both countries vote 'no,' or both countries abstain.[9] According to the resulting measure, China is—unsurprisingly—least aligned with the United States (with an agreement score of 0.244), followed by Israel (0.267) and Micronesia (0.444). It has the closest voting alignment with Dominica (with a score of 0.914), Syria (0.900), and Zimbabwe (0.894) (see also Table C.1 in the online appendix).[10]

We measure subnational political ties with two variables that vary at the province-country pair level. Our first measure, *Diplomatic representation*, is an indicator variable that records whether a partner country has at least one diplomatic mission (i.e., an embassy or consulate) in the respective Chinese province. Besides geographical and ideological distance, the political relevance (in terms of economic and military power) of the partner countries is among the most important determinants for the establishment of diplomatic representations at the country level (Neumayer 2008). Among China's largest trading partners, Thailand (9), South Korea (8), and Cambodia (8) maintain the most diplomatic missions in China. Whereas all embassies are in Beijing, consulates are usually spread across China, with their location reflecting the relative diplomatic importance of a province-country partnership. For instance, 76 countries maintain a consulate in Shanghai and 65 countries in Guangdong.[11] In further regressions, we test whether the role of embassies and consulates in mask trade creation differs.

Our second measure of subnational political ties is the *Number of sister linkages*, which records the total number of sister relationships for each province-country pair, counting both linkages at the provincial and lower administrative levels (Liu and Hu 2018). More than half of all countries (51%) in our sample have at least one sister relationship with a Chinese province. The United States tops the list with 258 such relationships, followed closely by Japan with 252 sister linkages.[12] In further regressions, we also distinguish between the *No. of upper-level sister linkages* that link either Chinese provincial governments or sub-provincial governments with foreign regional units and the *No. of lower-level sister linkages*, which refer to links that are established between Chinese prefecture-level cities or counties and their foreign counterparts.[13]

Beyond political ties, we account for the strength of excess demand for face masks, which varied according to how severely importing countries were affected in the early months of the pandemic.

[9]Abstention is treated as half-agreement with yes or no votes (Bailey et al. 2017). To minimize potential bias from outliers, we take an average over the three years preceding the pandemic from 2017–2019.

[10]The map in Figure B.2 in the online appendix illustrates the cross-country variation in this measure of national-level political relations.

[11]The maps in Figures B.3 and B.4 in the online appendix illustrate the cross-country and cross-province variation of diplomatic representations, respectively.

[12]The maps in Figures B.5 and B.6 in the online appendix illustrate the cross-country and cross-province variation in this measure of subnational political relations.

[13]Table C.2 in the online appendix includes statistics of the above two measures of subnational political ties for top-20 province-country pairs of face mask exports. 12 of these 20 pairs are linked with a diplomatic mission, compared to an average of only 3% in the full sample. They have 10.5 sister links on average, which clearly exceeds the sample average of 0.4.

Specifically, we use the variable *COVID-19 infections*, which captures the number of coronavirus infections per 10 million inhabitants in the importing country by the end of April 2020 (Wahltinez 2020). Moreover, to study alternative mechanisms, we rely on a host of further controls, measuring the strength of past dyadic economic relationships (*Past exports*, *Past imports*, *Past inward FDI*) and past aid linkages via *Past donations*, and typical gravity controls. Throughout the paper, all monetary values are measured in US dollars. Online Appendix A provides precise definitions for all variables used throughout the paper.

4 The impact of COVID-19 on face mask exports

Our empirical strategy relies on product-level regressions, comparing the monthly dynamics of bilateral exports of face masks (treatment group) with those of comparable products over time. This DiD approach can provide causal evidence on the effects of the outbreak of the coronavirus pandemic on face mask exports under two conditions: (1) if exports of products in the treatment and control groups followed a parallel trend before the pandemic outbreak, and (2) if the pandemic outbreak was the only (or main) underlying factor that changed in early 2020. As the pandemic outbreak led to a sharp increase in the global demand for face masks in 2020, the second condition is likely to hold in our context. To meet condition (1), we rely on two control groups of products that were comparable to face masks but were not directly affected by the COVID-19 pandemic, as described in Section 3.1. By contrasting face masks not only to other closely comparable made-up textile products, but also to the more general category of non-critical medical goods, we ensure that our estimates are not upward biased by a shift of production from products that are produced with similar production technologies towards face masks.

4.1 Event study estimates

We provide a test for the parallel trend assumption, by implementing an event-study design that plots the evolution of face mask exports in comparison to their control products based on the following regression:

$$X_{ijkt} = \exp\left[\phi_{it} + \lambda_{jt} + \delta_{ijk} \; + \sum_{m=-10}^{11} \beta_m \times Mask_{k,m}\right] \varepsilon_{ijkt}. \tag{1}$$

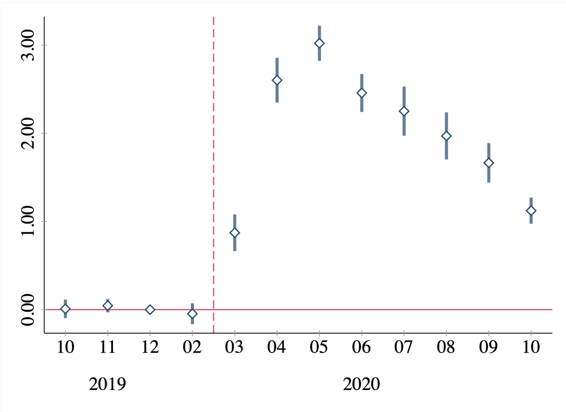
X_{ijkt} denotes our outcome variables, measuring export value, quantity, or price of product k from Chinese province i to partner country j in month t. The set of dynamic treatment indicators $Mask_{k,m}$ equals one for face masks in month $t = m$ and zero otherwise. We set the baseline period $m = 0$ to December 2019, which was the last month where neither China nor partner countries were measurably affected by the pandemic. Since China Customs reports combined trade data for January and February 2020 only, we group the months January and February in both years, leaving us with eleven monthly observations per year. To ease the graphical presentation, we combine all months between January and October 2019 into one indicator $Mask_{k,m\leq-2}$, and the months of October to December 2020 into a second indicator $Mask_{k,m\geq 9}$. In total, we plot eleven coefficients on our mask indicators $Mask_{k,m}$ in comparison to the baseline month December 2019.

For trade value and quantity, we build on the gravity literature (e.g., Anderson and Van Wincoop 2003, Arkolakis et al. 2012, Head and Mayer 2014) and estimate equation (1) with the Poisson Pseudo-Maximum Likelihood (PPML) estimator to accommodate for zero trade flows as well as the heteroskedastic nature of trade data (Santos Silva and Tenreyro 2006). For prices, we run ordinary least squares (OLS) regressions, and thus take the natural logarithm of this equation when regressing log prices on the dynamic treatment indicators. We cluster error terms at the province-country-product level to allow for serial correlation.

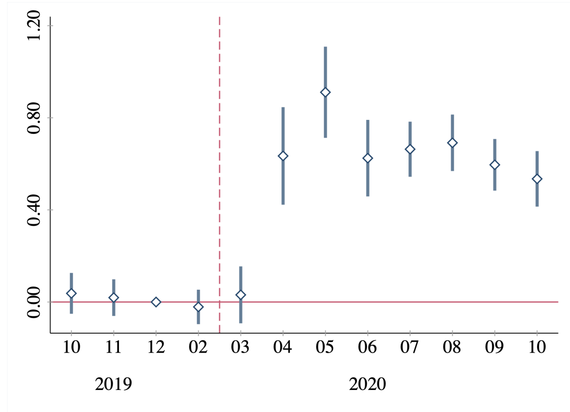
The regressions are conditional on a rich set of fixed effects. Province-time fixed effects, ϕ_{it}, factor out all macro-level shocks that affect all exports by the respective Chinese province in a given year. For instance, province-time fixed effects take into account the differential exposure to the pandemic (and shutdown measures) by Chinese provinces at a point in time, such as the early outbreak in Hubei province.[14] Country-time fixed effects, λ_{jt}, capture differences in the overall economic activity and general demand fluctuations in the respective partner country over time. For instance, they can factor out the average effects of country-specific lockdowns or trade disruptions that affected the exports of face masks and all other comparable products to this country. Finally, bilateral product fixed effects, δ_{ijk}, control for the overall strength of trade relations between a Chinese province and its trade partner country. We allow these time-invariant fixed effects to be product specific, accounting for product-specific differences in (past) bilateral trade linkages.

Figure 4 plots our monthly estimated coefficients, $\beta_{\leq-2}$ to $\beta_{\geq 9}$, as compared to the baseline period of December 2019. The event study graphs show that before March 2020, the exports of masks and their control products (other made-up textile products within the same HS 4-digit subchapter) followed a precisely estimated parallel trend in terms of their values, quantities, and prices. This supports our parallel trend assumption (1). Starting with the pandemic outbreak in March 2020, the total value of mask exports skyrocketed. The nearly four-fold increases in export values of masks by May 2020 (panel a) arises from a doubling of exported quantities (panel b) and an about three-fold increase in prices (panel c). These increases are substantially smaller than those in the raw data as they eliminate the trends common to product exports from Chinese provinces and to partner countries. The differential price effects reached their maximum in May 2020. Price effects decreased gradually afterward, converging to a somewhat higher and significantly different equilibrium level than pre-pandemic prices. Export quantities for masks started to increase only in April 2020. This slower adjustment can be explained by the shutdown of production lines, as China went into a countrywide lockdown in January–March 2020.

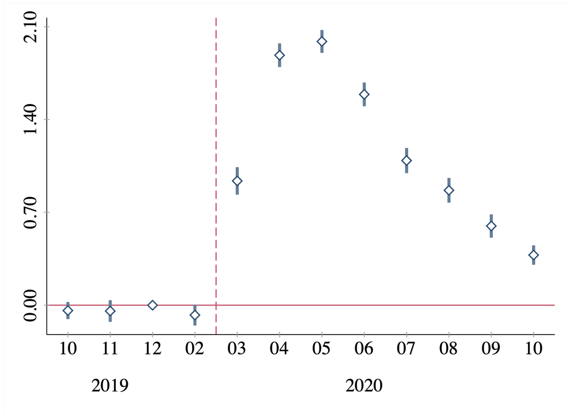
[14] Nitsch (2022) shows that pandemic-induced shifts in transportation modes in New Zealand's exports were due to supply-side frictions. Province-time fixed effects capture such supply-side differences in trade costs.



(a) Export value



(b) Export quantity



(c) Export price

Figure 4: Event study estimates of face mask exports between January 2019 and December 2020

Notes: This figure plots monthly coefficient estimates and the corresponding 95% confidence intervals of dyadic exports of face masks as compared to two control products within the same HS 4-digit subchapter (made-up textiles) as specified in equation (1). Coefficient estimates in panels a and b rely on PPML, in panel c on OLS. The reference month is December 2019; the first coefficient pools the months January 2019 to October 2019, whereas the last coefficient combines October to December 2020. February 2020 in the figure represents January and February as the raw customs data report these two months together. We combine data of January and February of 2019 to ensure consistency across years.

From June 2020 onward, export quantities of face masks remained relatively stable at a level about 50 percent larger than the pre-pandemic benchmark.

Our estimated dynamics are robust after changing the control group for face masks to non-critical medical products instead of made-up textile articles. Figure B.1 in the online appendix shows very similar dynamic estimates to Figure 4: the values, quantities, and prices of face mask exports developed similarly relative to both control groups. Importantly, the alternative control group also results in parallel pre-trend estimates.

4.2 Aggregate difference-in-differences results

We reproduce the basic DiD results from the monthly event study estimates at the aggregate level, i.e., we estimate monadic exports at the level of HS 8-digit products. We again use PPML for trade values and quantities and OLS for prices. We focus on the early months after the pandemic outbreak (April–

June 2020), comparing the export dynamics of face masks to the two types of control products over the same months one year before (April–June 2019). We estimate the following model:

$$X_{jkt} = \exp\left[\beta\, Mask_k \times Post_t + \lambda_{jt} + \delta_{jk}\right] \varepsilon_{jkt}, \tag{2}$$

where X_{jkt} captures the value, quantity, or price of exports of product k from China to country j in month t. The treatment indicator, $Mask_k$, takes a value of one for face masks and zero otherwise, whereas the $Post_t$ indicator takes one for the months after the pandemic outbreak. The fixed effects, λ_{jt} and δ_{jk}, capture all aggregate demand fluctuations at the country level as well as the product-specific past trade linkages between each country and China.

Table 1: Face mask exports before and after the pandemic outbreak: Country-level DiD

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Masks × Post	2.906***	0.815***	2.075***	2.974***	0.906***	2.143***
	(0.197)	(0.155)	(0.050)	(0.184)	(0.096)	(0.046)
Observations	3,116	3,116	2,543	63,147	62,103	34,047
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variables measure the value, quantity, or the natural logarithm of the unit price of face mask exports from China to each partner country. The estimation sample includes HS 8-digit product-level data in April–June of 2019 and 2020. The treatment group consists of face masks, the control group in columns 1–3 includes two other types of made-up textiles (within the same HS 4-digit subchapter), and the control group in columns 4–6 includes 214 non-critical medical products. Columns 1, 2, 4, and 5 are estimated using PPML and columns 3 and 6 using OLS. Standard errors clustered at the country level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 1 reports the country-level DiD estimates. In the first months of the pandemic, the increase in the value of mask exports is substantial in magnitude and highly statistically significant: Mask exports increase 18-fold compared to other textile products (column 1). This effect is more closely comparable to the raw data than the dyadic results. The aggregate results confirm also that there was an increase, both in traded quantities (226%) and prices (796%) (columns 2 and 3). The dominance of the price effect underscores that export supply could not adjust quickly enough to the increase in global demand. We come to the same qualitative conclusions when we change the control group: export values, quantities, and prices of face masks increased by relatively similar magnitudes compared to non-critical medical products (columns 4–6).

5 The role of political relations: Triple difference estimations

5.1 Empirical models

Building on the parallel trends assumption validated in Section 4.1 and on the aggregate DiD results from Section 4.2, we estimate triple difference models to investigate which factors have contributed to the rapid expansion of the export of face masks. We build our triple difference strategy in two stages.

First, we extend the country-level DiD model by adding our measure of national-level political alignment to test whether close political ties facilitated the sourcing of face masks after the pandemic outbreak. Our estimation model expands equation (2) by adding country-level interaction variables and product-month fixed effects:

$$X_{jkt} = \exp\left[\beta_1 \,\mathrm{UN}_j \times Mask_k \times Post_t + \beta_2 \,\mathrm{Covid}_j \times Med_k \times Post_t + \lambda_{jt} + \theta_{kt} + \delta_{jk}\right] \varepsilon_{jkt}. \tag{3}$$

Compared with equation (2), the dependent variables remain unchanged, measuring the value, quantity, and price of product-level exports from China to partner country j in month t. The original treatment variable, $Mask_k \times Post_t$, is subsumed now by the product-month fixed effects θ_{kt}. Instead, we investigate how the treatment effect varies with two main explanatory factors: (1) the strength of political relations at the national level, measured by UN_j, capturing the strength of past voting agreement between country j and China in the UN General Assembly, and (2) a proxy for the demand for medical masks, Covid_j, which records the inverse hyperbolic sine of the number of COVID-19 infections per 10 million inhabitants in the destination country immediately after the pandemic outbreak.

Second, we compare the role of national-level political alignment to subnational-level political relations. We again disaggregate our data and run regressions at the province-country-product level. Our preferred triple difference specification takes the following form:

$$\begin{aligned} X_{ijkt} = \exp[\mathrm{C}'\,\alpha &+ \beta_1 \,\mathrm{UN}_j \times Mask_k \times Post_t + \beta_2 \,\mathrm{P}_{ij} \times Mask_k \times Post_t \\ &+ \beta_3 \,\mathrm{Covid}_j \times Mask_k \times Post_t + \phi_{it} + \lambda_{jt} + \theta_{kt} + \delta_{ijk}]\varepsilon_{ijkt}, \end{aligned} \tag{4}$$

where X_{ijkt} measures the value, quantity, and price of exports of HS 8-digit product k from province i to country j in month t. This triple difference strategy includes all fixed effects from equation (1), controlling for exporter province-month, ϕ_{it}, partner country-month, λ_{jt}, and time-invariant dyadic-partner-product, δ_{ijk}, fixed effects. As described in Section 4.1, these fixed effects control for all supply and demand shocks that affect all comparable products alike and product-specific past bilateral trade. Just like in equation (3), we include product-time fixed effects, θ_{kt}, which capture all product-time-specific variation to focus on differential increases in face mask exports across province-country pairs.

We assess the relative importance of national and subnational political relations for the rapid expansion of trade by building triple difference specifications that interact the treated product indicator,

$Mask_k$, and the treated time period indicator, $Post_t$, with measures of political ties at the national and the subnational level. As before, UN_j denotes our national-level measure of political relations, a measure of the voting agreement of country j with China in the UN General Assembly. The two subnational measures of political relations, P_{ij}, vary instead at the level of province-country pairs and indicate either the presence of diplomatic representations of country j in province i, or the number of sister linkages between administrative units of country j and province i. The demand for medical masks is proxied by Covid_j, which captures the rate of COVID-19 infections per 10 million inhabitants in the destination country j in the early stages of the pandemic. To fully specify our models, we include all two-way interaction combinations denoted by vector C.[15] Table C.3 provides descriptive statistics for all variables used in the dyadic regressions.

5.2 Main results

Table 2 displays the triple difference results between China and its trading partners from equation (3), differentiating the pandemic increases in Chinese face mask exports by national political alignment and pandemic affectedness. Countries that suffered a higher infection rate right at the beginning of the coronavirus outbreak increased their imports of face masks in terms of values and quantities. Our elasticity estimates show that a doubling of documented COVID-19 infections by April 2020 resulted in about 14 to 16% more face masks imported from China in the first three months, depending on the comparison group. At the same time, a doubling of early pandemic infection rates in an importing country resulted in higher prices by about 11 to 15%, reflecting the effects of greater product demand.

Political alignment at the national level also facilitated access to Chinese face masks. A country with a one standard deviation (11 points) closer voting alignment with China at the UN General Assembly, which roughly reflects the difference between China's voting alignment with Portugal (0.66) and Brazil (0.77), imported 16 to 24% more face masks in the early months. However, national political ties did not result in a lower price as both 'friends' and 'foes' were paying the extremely increased market price. The results on national political ties are robust to measurement and the inclusion of further interactions. Replacing our baseline measure of UN voting alignment with the ideal point distance between China and the respective trade partner country, or with the voting alignment with the United States (rather than China), yield the expected opposite results (see Table C.4 in the online appendix).[16] We also test whether the relevance of national political ties persists if we control for a series of interactions with classical gravity variables (see Table C.5 in the online appendix). We find that the increase in exported quantities of face masks was not larger in countries that have generally lower trading costs with China, as

[15] Two-way interactions include: $\mathrm{C}'\alpha = \alpha_1 \mathrm{P}_{ij} \times Post_t + \alpha_2 \mathrm{P}_{ij} \times Mask_k + \alpha_3 Mask_k \times Post_t$. The interactions $P_{ij} \times Mask_k$ and $Mask_k \times Post_t$ are absorbed by fixed effects.

[16] Ideal point distance—in contrast to pure voting alignment—also weighs resolutions by how well votes reflect the countries' main preferences (Bailey et al. 2017).

Table 2: The role of national politics: Country-level triple difference estimates

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	3.053***	1.961***	0.373	2.686***	1.377***	0.170
	(0.406)	(0.281)	(0.408)	(0.398)	(0.374)	(0.415)
asinh COVID-19 infect. × Masks × Post	0.394***	0.158**	0.151***	0.326***	0.137*	0.105***
	(0.094)	(0.068)	(0.035)	(0.090)	(0.077)	(0.036)
Observations	3,116	3,116	2,543	62,932	61,879	33,921
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variables measure the value, quantity, or the natural logarithm of the unit price of face mask exports from China to each partner country. The estimation sample includes HS 8-digit product-level data in April–June 2019 and 2020. The treatment group consists of face masks, the control group in columns 1–3 includes two other types of made-up textiles (within the same HS 4-digit subchapter), and the control group in columns 4–6 includes 214 non-critical medical products. Columns 1, 2, 4, and 5 are estimated using PPML and columns 3 and 6 using OLS. Standard errors clustered at the country level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

proxied by geographic distance, and economically more powerful countries, as proxied by GDP, were also not in a better position to source face masks. While we observe that the increase in quantities was even somewhat smaller in countries that are part of a regional trade agreement (RTA) with China, we find no robust advantage for China's neighbors. The price regressions show that face mask prices increased with distance, but direct neighbors also ended up paying a higher price. Most importantly, however, the relevance of national political ties is robust to the inclusion of these additional variables.

The disaggregated analysis at the level of pairs of Chinese provinces and partner countries allows us to add the two subnational political variables to the two country-level moderating factors. Table 3 presents the findings. The results for voting agreement in the UN General Assembly and early pandemic affectedness are qualitatively comparable to our results at the national level. When focusing on subnational political ties, both diplomatic representation and sister linkages seem to facilitate the sourcing of face masks after the pandemic outbreak. Countries with a diplomatic representation (either an embassy or a consulate) increased the quantity of face mask imports by 53 to 84%, depending on the comparison group. However, similarly to national-level political ties, diplomatic representation did not lower the price of face masks. The results for sister linkages are markedly different in this respect. For each additional sister tie, we see a small increase in the quantity of mask exports (by more than 1%) *and* a reduction in the achieved price by about 1%. With quantities increasing and prices decreasing, we do not observe higher trade values for countries with additional sister ties. These differences might appear symbolic, but for some country-province pairs with solid ties—for instance, Jiangsu province has 35 sister linkages to the United States and Japan each, Shandong maintains 23 sister linkages to South Korea—our model thus predicts considerable price reductions.

Table 3: The role of national vs. local politics: Dyadic triple difference estimates

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	3.214***	2.485***	-0.015	2.718***	1.940***	-0.032
	(0.455)	(0.395)	(0.282)	(0.371)	(0.411)	(0.211)
Dip. representation × Masks × Post	0.655***	0.611***	0.061	0.686***	0.424***	0.028
	(0.148)	(0.145)	(0.069)	(0.111)	(0.122)	(0.056)
No. of sister linkages × Masks × Post	0.004	0.015**	-0.010*	-0.001	0.013*	-0.012**
	(0.009)	(0.006)	(0.006)	(0.010)	(0.007)	(0.005)
asinh COVID-19 infect. × Masks × Post	0.402***	0.200***	0.039*	0.326***	0.178***	0.037**
	(0.057)	(0.040)	(0.023)	(0.048)	(0.045)	(0.019)
Observations	33,495	33,268	16,229	247,483	242,171	84,572
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variables measure the value, quantity, or the natural logarithm of the unit price of face mask exports from each Chinese province to each partner country. The estimation sample includes HS 8-digit product-level data in April–June of 2019 and 2020. The treatment group consists of face masks, the control group in columns 1–3 includes two other types of made-up textiles (within the same HS 4-digit subchapter), and the control group in columns 4–6 includes 214 non-critical medical products. Beyond the listed fixed effects, two-way interactions are added for each province-country link variable (diplomatic representations and sister linkages) times a post indicator. Columns 1, 2, 4, and 5 are estimated using PPML and columns 3 and 6 using OLS. Standard errors clustered at the country-province-product level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.3 Robustness checks

A primary concern with our results is that the estimated effects of political ties might simply capture the history of economic relations that contributed to the formation of trade networks (Liu et al. 2001, Chaney 2014, Morgan and Zheng 2019). For example, political ties might have facilitated the establishment of economic linkages in the past, which could have eased the expansion of face mask trade during the pandemic outbreak. To check for this alternative explanation, we extend our main specification from equation (4) by interacting the treatment with past trade, investment, and aid linkages. We measure past trade linkages through the value of *Past exports* and *Past imports* that capture the average yearly value of trade for each province-country pair in 2017 and 2018. We measure investment linkages by the average annual value of *Past inward FDI* flows from partner countries to Chinese provinces from 2015 to 2017 (MOFCOM 2019). We measure past aid linkages with *Past donations*, which capture the value of aid exports from partner countries to each of the Chinese provinces at the first peak of the coronavirus epidemic in China in January and March 2020.[17] We expect that such donations may have been systematically reciprocated by diplomatic gestures by the Chinese government.[18]

[17]Within the first three months of 2020, the United States had exported the most aid to China (US$ 36.8 million), followed by South Korea (US$ 23.8 million) and Japan (US$ 21.2 million). Altogether, 120 countries donated goods to China, including many instances of South-South cooperation. Countries donated mostly medical

Table 4: Mechanisms: The role of past trade, investment, and aid linkages

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	2.167***	1.767***	-0.034	1.727***	1.309***	-0.032
	(0.427)	(0.363)	(0.288)	(0.394)	(0.462)	(0.212)
Dip. representation × Masks × Post	0.813***	0.720***	0.066	0.819***	0.568***	0.061
	(0.154)	(0.159)	(0.076)	(0.111)	(0.146)	(0.060)
No. of sister linkages × Masks × Post	0.024**	0.030***	-0.012*	0.023**	0.030***	-0.007
	(0.010)	(0.008)	(0.007)	(0.012)	(0.009)	(0.006)
asinh COVID-19 infect. × Masks × Post	0.392***	0.197***	0.042*	0.311***	0.177***	0.042**
	(0.053)	(0.039)	(0.024)	(0.046)	(0.045)	(0.019)
asinh Past exports × Masks × Post	-0.322***	-0.231***	0.037	-0.388***	-0.230***	-0.001
	(0.069)	(0.061)	(0.029)	(0.054)	(0.061)	(0.021)
asinh Past imports × Masks × Post	0.026	0.019	0.004	0.067**	0.022	-0.008
	(0.037)	(0.032)	(0.015)	(0.028)	(0.028)	(0.009)
asinh Past inward FDI × Masks × Post	-0.021	-0.018	-0.018*	0.004	-0.011	-0.008
	(0.028)	(0.020)	(0.010)	(0.018)	(0.018)	(0.007)
asinh Past donations × Masks × Post	0.029*	0.022*	0.001	0.023*	0.019	0.003
	(0.016)	(0.012)	(0.006)	(0.012)	(0.012)	(0.005)
Observations	33,495	33,268	16,229	247,483	242,171	84,572
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications closely follow those in Table 3. Past trade measures the total value of dyadic exports and imports in 2017 and 2018. Past FDI measures the average yearly FDI inflows from 2015 to 2017. Past donations measures donations from countries to Chinese provinces from January to March 2020. All variables are transformed by the inverse hyperbolic sine function. Beyond the listed fixed effects, two-way interactions are added for each province-country link variable (diplomatic representations, sister linkages, trade, FDI, and donations) times a post indicator. Columns 1, 2, 4, and 5 are estimated using PPML, and columns 3 and 6 use OLS. Standard errors clustered at the country-province-product level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

When adding those additional triple interactions in Table 4, results on our political variables stay qualitatively the same—only the price-reducing role of sister linkages weakens when comparing masks to non-critical medical products. We find no evidence that the expansion of masks exports would have followed past trade ties. On the contrary, the relative increase in mask exports was significantly lower for province-country pairs that started from higher levels of exports in the past. This highlights the special situation during the pandemic outbreak when a large number of countries with little commercial province-country linkages were not only trying but also successful in sourcing face masks from China. It appears that countries that invested more in certain provinces also ended up paying lower prices, although the coefficient is only statistically significant when comparing masks with other similar textile products. Additionally, donations at the time of the Chinese pandemic outbreak were associated with a larger increase in the value of face mask exports, suggesting some degree of political reciprocity. Overall, these results show that the effects of political relations went beyond those that were moderated through past trade and FDI linkages.

We might also be concerned whether our political variables really capture *political* ties as they might have also been established with the explicit goal of promoting trade. Economic diplomacy is an essential part of China's diplomatic activities. To demonstrate that our results do not merely reflect the effects of recent—and thus potentially economically motivated—ties, we re-estimate our model using historical links only. With respect to national political alignment, we consider UN voting alignment between 1971, the year in which the People's Republic of China replaced the Republic of China (Taiwan) in the UN, and 1991. Concerning our subnational measures, we restrict our dyadic measures of diplomatic representations and sister linkages to those ties that were established before 1992. We use 1992 as a breaking point as it marks the end of the Cold War with the dissolution of the Soviet Union in December 1991 and Deng Xiaoping's southern tour in the spring of 1992, an important key event in China's Reforming and Opening Up program. By measuring the strength of links in place before China's economic opening, we can ensure that they reflect historical political alignment only. Since our results, by and large, hold with historical political ties (see Table C.6 in the online appendix), it seems that politics indeed drives our main finding.[19]

Trade in face masks predominantly consists of commercial exports and contains aid exports. Arguably, the role of political ties in China's exports is likely to be stronger for the latter than for the former. Previous research has shown that countries with a close voting alignment with China in the UN receive

equipment (93% of total donation imports), but our measure also includes other donations, like that of 30,000 sheep by Mongolia (Damdinsuren and Namjildorj 2020). See Fuchs et al. (2022) for an overview on how to measure aid flows with China Customs data.

[18]For instance, the New York Times (2020) cites an official from the Ministry of Commerce in Beijing stating: "In the previous stage of prevention and control, many countries have offered to help us, and we are willing to offer affected countries our share of help while we can."

[19]When decomposing historical sister linkages into upper- and lower-level links, an exercise similar to that in Table 6 in Section 5.5, lower-level linkages still significantly contribute to lowering prices (see Table C.6). It is noteworthy that historical diplomatic representations appear to be linked with larger price increases. Still, this finding is not robust to the usage of non-critical medical products as control.

significantly more aid, while countries that recognize the government in Taipei, rather than the one in Beijing, are largely excluded from receiving aid (Dreher and Fuchs 2015, Dreher et al. 2018). Moreover, during the COVID-19 crisis, Beijing incorporated the pandemic response into its strategy to become a leading actor in global development and health (Fuchs et al. 2022). To rule out that our conclusions are driven by the more political aid exports, we run robustness checks that exclude all donation exports and focus exclusively on commercial exports. We obtain results (see Table C.7 in the online appendix), which are closely comparable to those for our main specification in Table 3, confirming that our main findings reflect the expansion of commercial exports.

Further robustness checks confirm that our results are not likely to be driven by outliers. For example, our results are stable even if we exclude the United States from the sample to account for the possibly confounding effects of the US–China trade war (see Table C.8 in the online appendix). Applying the same logic, we also show that our results persist when we exclude Beijing, the province-level municipality that is the seat of the central government and hence, is more likely to carry out central government policies, or Hubei, the province where the outbreak started (see Table C.9 in the online appendix). Finally, our main findings are robust to clustered standard errors at the country-province pair level (see Table C.10 in the online appendix).

5.4 The creation of new trade links

While our results so far show that close political ties facilitated access to face masks, we now turn to the question of *how* politics helped to source this critical medical good. First, we explore the role of politics in creating new trade links. Setting up a new trade link requires information on possible buyers and sellers. Gathering such information, however, costs time. Political ties may help to build such information links and create the trust needed to make a deal (see Section 2). To test the proposition that political ties helped create new trade links, we estimate the determinants of the extensive margin of face mask exports. To do so, we use a sample of province-country pairs that had no trade links from April–June 2019 for product k and create a binary indicator that captures the presence of a new trade tie for a given pair in the three analyzed months in 2020.[20] We run linear probability models that include country-province and product-province fixed effects.

Results in Table 5 suggest that close national and subnational political relations as well as pandemic affectedness spurred on the formation of new trade ties significantly. Compared to effects that also include the intensity of trade (in Table 3), the relative magnitude of coefficients on subnational ties is increasing compared to that on national ties. The likelihood of a new bilateral trade link increases by about 13 to 15 percentage points for each sister relationship, whereas a diplomatic representation increases it by 28 to 33 percentage points. UN voting agreement also matters, but while its effects on traded quantities

[20]We get similar results when we define new trade links as province-country pairs having no exports in all months of 2019 for product k but having exports from April–June 2020.

Table 5: Political ties and the creation of new trade links

Control group	Other made-up textile products	Non-critical medical products
	(1)	(2)
UN voting agree × Masks	0.191***	0.197***
	(0.069)	(0.070)
Dip. representation × Masks	0.282***	0.326***
	(0.069)	(0.058)
No. of sister linkages × Masks	0.126***	0.145***
	(0.022)	(0.018)
asinh COVID-19 infect. × Masks	0.041***	0.045***
	(0.004)	(0.004)
Observations	13,464	1,250,721
Country-province FE	Yes	Yes
Product-province FE	Yes	Yes

Notes: The sample is restricted to province-country pairs without export linkages for each HS 8-digit product in 2019. The dependent variable is a binary variable that equals one for province-country pairs that exported each HS 8-digit product from April to June 2020, but not in the same months in 2019, and is zero for those without export linkages in both years. Regressions are estimated by OLS; standard errors clustered at the country-province level are reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

were more substantial, a one standard deviation (11 points) larger voting alignment with China increases the likelihood of new trade links by only about 2 percentage points. Thus, subnational ties played a relatively larger role in facilitating the creation of new trade links than national ties.[21]

5.5 The trade-promoting effect of subnational political relations

To better understand the mechanisms of the trade-promoting effect through subnational political linkages, we differentiate between two types of diplomatic missions (embassies and consulates) and further distinguish between upper- and lower-level sister ties as described in Sections 2 and 3. For diplomatic missions, Table 6 shows that both embassies and consulates helped countries to source face masks from the respective provinces. The effect of embassies is stronger than that of consulates, which is in line with van Bergeijk et al. (2011).[22] The results on sister linkages show a considerable difference between lower- and higher-level sister ties. Upper-level twinning of (sub-)provinces is similarly related to trade creation as diplomatic missions: they helped to source larger quantities of mask exports (compared to other made-up textile products) but did not help lower prices. Lower-level sister ties (referring to the twinning of sister cities, counties, and districts) lead to larger quantities of mask exports (albeit to a smaller degree), yet additionally show a highly significant price-dampening effect on mean prices. This

[21] In a complementary analysis, Table C.11 in the online appendix focuses on the intensive margin of trade creation by restricting the sample to products where bilateral trade links existed already in 2019. Results for the intensive margin are in line with our main findings in Table 3.

[22] Since embassies are located exclusively in Beijing, a concern is that our estimates for diplomatic representations merely pick up a capital-province effect. Finding significant trade creation effects for consulates eases this concern. A further robustness check that excludes Beijing from the analysis confirms that our general estimates for diplomatic missions are also not considerably affected by this issue (see again Table C.9 in the online appendix).

is surprising, as no other political variable explains differential price increases of face masks after the pandemic outbreak (see again Table 3). Our findings suggest that lower-level linkages, which mainly build on personal relationships, have indeed contributed to reducing the extreme price markups experienced after the global pandemic outbreak.

Table 6: Subnational decisions: The role of sister linkages and diplomatic representations

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Sister linkages:						
No. of lower-level links × Masks × Post	-0.002	0.011*	-0.021***	-0.004	0.013*	-0.023***
	(0.009)	(0.006)	(0.008)	(0.011)	(0.007)	(0.007)
No. of upper-level links × Masks × Post	0.125***	0.085**	0.040	0.072*	0.041	0.039
	(0.044)	(0.034)	(0.033)	(0.037)	(0.039)	(0.027)
Diplomatic representations:						
Embassy × Masks × Post	2.470***	1.881***	0.251	2.878***	1.965***	0.115
	(0.413)	(0.407)	(0.206)	(0.282)	(0.315)	(0.113)
Consulate × Masks × Post	0.550***	0.549***	-0.006	0.493***	0.343***	-0.051
	(0.149)	(0.145)	(0.075)	(0.108)	(0.119)	(0.064)
Observations	33,495	33,268	16,229	247,483	242,171	84,572
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications closely follow those in Table 3. Lower-lever sister linkages record ties between foreign administrative entities and Chinese counties or prefectural cities. Upper-level linkages record ties between foreign administrative units and Chinese provinces (or comparable administrative entities). Columns 1, 2, 4, and 5 are estimated using PPML and columns 3 and 6 using OLS. Standard errors clustered at the country-province-product level are reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

As a final test to understand how political ties can promote trade, we examine the channel of central government control over provinces. In Table 7, we add the share of SOEs held by the central government within the provincial firm output as a fourth layer of interactions to our main triple difference specification. We rely on firm-level data from the Annual Survey of Industrial Enterprises from 2014, the last year for which we have access to this specific firm survey data. As argued before, national SOEs play an important role in complying with national-level policy interests (Davis et al. 2019). Thus, the SOE share captures whether the role of political ties in trade expansion varied with a measure of central government control. We expect that the intensity of central-government SOE presence in each province might help explain differences in the importance of national-level and subnational-level political ties across provinces.

Results in Table 7 provide partial evidence for the differing relevance of the central government objectives depending on the degree of centralization in the economy. While our findings on these four-fold interactions are not fully consistent across the two control groups, column 6 reports that national friends, i.e., countries that align more strongly with China in UN voting, receive a lower average price on masks from provinces with a large SOE dominance. Moreover, the quantity of mask exports increases by substantially less due to the presence of diplomatic missions (bilateral linkages), when SOEs are more dominant (columns 1, 2, and 4).[23] Both results point towards the differential relevance of central- and local-level international linkages depending on the centralization of economic decision making in general.

Table 7: Subnational decisions: The role of SOEs

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	3.725***	2.712***	0.564	3.328***	2.642***	0.427
	(0.810)	(0.689)	(0.422)	(0.558)	(0.609)	(0.299)
Dip. representation × Masks × Post	1.169***	1.083***	-0.099	0.681***	0.386*	-0.044
	(0.250)	(0.264)	(0.129)	(0.177)	(0.218)	(0.103)
No. of sister linkages × Masks × Post	0.009	0.014	-0.009	0.012	0.023**	-0.010*
	(0.015)	(0.011)	(0.007)	(0.016)	(0.011)	(0.006)
SOE share × UN v. agree × Masks × Post	-3.369	-0.939	-4.268	-4.411	-5.008	-3.204*
	(6.744)	(5.306)	(3.112)	(4.719)	(3.783)	(1.724)
SOE share × Dip. repr. × Masks × Post	-7.050***	-5.887***	0.739	-2.311*	-0.829	0.050
	(2.492)	(2.109)	(0.949)	(1.301)	(1.498)	(0.629)
SOE share × No. sister l. × Masks × Post	0.064	0.123	0.023	-0.020	-0.004	0.011
	(0.220)	(0.143)	(0.075)	(0.192)	(0.135)	(0.058)
Observations	33,495	33,268	16,229	247,483	242,171	84,572
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two and three-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications build on those described in Table 3 and add further interactions with the share of SOEs. The share of SOEs refers to the output share of state-owned enterprises held by the central government within the provincial firm output in 2014. Beyond the listed fixed effects, all two- and three-way interactions are included that are needed to fully specify the model. Standard errors clustered at the country-province-product level are reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6 Conclusion

The first weeks of the COVID-19 pandemic revealed the dependence of many economies on vital goods imported from China. Countries entered a race to secure face masks to mitigate the spread of the virus. This article investigates the factors that explain the quick expansion of face mask exports, distinguishing between traded quantities, average product prices, and the total value of trade. To do so, we collected data on monthly exports of face masks from China's provinces to trade partner countries around the world at the HS 8-digit level. We built a difference-in-differences strategy, comparing the dynamics of

[23]When compared to other made-up textile products, in a province with a one standard deviation higher output share by centrally controlled SOEs (see Table C.3), the export quantity-increasing effect of diplomatic representations is reduced by $0.13 \times (e^{-5.89} - 1) \times 100 = 13$ percent.

face mask exports before and after the global pandemic outbreak to those of two control groups: made-up textile products and non-critical medical products. We ran regressions, both for total Chinese exports to each country and for dyadic export flows between province-country pairs. Estimates of monthly dynamic treatment effects confirmed that masks and their control products followed a fully parallel trend before the pandemic outbreak. Hence, we consider our estimates to be causal. Furthermore, our aggregate results show a sharp increase in the value of exported face masks after the pandemic outbreak. This increase reflects the steep rise in price when global demand for face masks unexpectedly surged. Starting from April 2020, the exported quantity of face masks also quickly expanded, creating new trade links between countries and China's provinces.

We examined the drivers of rapid trade expansion in the first three months of the global pandemic, exploring more specifically the role of national and subnational political relationships and comparing them to the role of past economic ties. We relied on a triple difference strategy at the level of dyadic province-country pairs, conditional on country-month, province-month, product-month, and province-country-pair-product fixed effects. Our results show that both national political alignment (captured by voting agreement with China in the UN General Assembly) and subnational linkages (measured by the presence of diplomatic representations within the province and sister ties) contributed to the expansion of exported quantities. Moreover, sister relations and especially ties between lower-level administrative units resulted in a somewhat lower price for face masks, providing evidence for "special treatment" of regional partners in commercial relationships.

These findings imply that it is prudent for countries to diversify their sources of strategic goods. Moreover, our findings also demonstrate that political relations with China's provinces might "pay off" as they contribute to facilitating trade and especially to the quicker formation of new trade ties. Future research could delve deeper into the role of migrant networks as a facilitator of trade once dyadic diaspora data at the level of Chinese provinces are available. Moreover, rather than exploring the drivers of China's trade in medical equipment, scholars may want to study its effects on attitudes towards China in its trade partner countries. In light of anecdotal evidence on "poor quality" mask and ventilator exports, future analyses of China's medical equipment exports could account for quality differences. Finally, researchers might want to understand the patterns of China's trade of COVID-19 vaccines and the role that political ties played in the resulting global trade patterns.

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ONLINE APPENDIX

A Data generation and description of variables

Estimation sample Our dyadic results are based on bilateral linkages between 192 partner countries and 31 Chinese provinces, which results in a total of 5,952 province-country pairs. We exclude the Chinese territories Hong Kong, Macao, and Taiwan for obvious reasons and eight countries and territories (Democratic People's Republic of Korea, Holy See, Liechtenstein, Monaco, Palestine, San Marino, South Sudan, and Western Sahara) due to missing political or gravity controls.

Exports of face masks and control products We identify face masks by relying on a list of essential medical products (GACC 2020a), which was announced in early April 2020 by the General Administration of Customs of China as a response to mounting quality complaints with respect to Chinese medical exports. Face masks are top 1 on the list with a Harmonized System (HS) 10-digit code 6307900010 ("Medical masks"). As our export data are available at the HS 8-digit level, we define face masks in our data as 63079000 ("Made-up articles, including dress patterns, nes").

In our DiD analysis, we define two groups of control products. The first group includes those within the same HS 4-digit subchapter as face masks (6307), including 63071000 ("Floor-cloths, dish-cloths, dusters and similar cleaning cloths") and 63072000 ("Life-jackets and life-belts"). The second group includes non-critical medical products. We specifically define non-critical medical products by relying on the list of medical products from Helble (2012), from which we exclude 80 critical medical products listed by the World Customs Organization (WCO) and the World Health Organisation (WHO) (WCO/WHO 2020), and also the 11 critical medical products defined by the Chinese government (GACC 2020a). A full list of the control products is shown in Table C.12.

Source: For the official announcement on the 11-product list (HS 8-digit), see GACC (2020a); for the 80-product list (HS 6-digit), see WCO/WHO (2020); for the full list of medical products, see Helble (2012).

UN voting agreement, ideal-point distance, and agreement s-score In our main regressions, we use the UN voting agreement index with China to measure political distances between China and its trade partners. The index captures voting similarity between China and its respective trade partners in the UN General Assembly. The variable is calculated based on the overlap of votes (1 = "yes" or approval for an issue; 2 = abstain, 3 = "no" or disapproval for an issue.). Overlaps of "yes" or "no" votes are counted as full agreements and abstention is treated as half-agreement with a yes or no vote (Bailey et al. 2017). We compute our UN voting agreement variable as the average similarity index from 2017 to 2019. Yearly data on this index are obtained from Voeten et al. (2009).

In robustness checks, we have two variations on this variable. First, we consider the average voting similarity index between China and its trade partners from 1971, the year when China became a UN member, to 1991. Second, we calculate the average voting similarity index between the US and other countries from 2017 to 2019 to measure each country's political distance from the United States instead of China.

We also test two alternative measures of political relations at the country level. The first one is the estimated ideal-point distance from China. This measure captures disagreement among country pairs during voting sessions in the UN General Assembly, weighting each roll call by taking into account how well votes reflect the reference country's main preferences. Similar to the voting agreement index, we calculate the average ideal-point distance from China between 2017 and 2019. This index ranges from 0.04 (Seychelles) to 3.12 (United States), with a higher value indicating a stronger voting disagreement.

The second alternative measure is the voting s-score. It is a standardized measure of UN voting agreement between country pairs with its value ranging from -1 (two countries disagree on all resolutions) to 1 (two countries agree on all votes).

Data on the ideal-point distance and the voting s-score are obtained from Voeten et al. (2009).

Diplomatic representation In dyadic regressions, the indicator variable equals one if a partner country has a consulate or embassy in the respective Chinese province by the end of 2019. In robustness checks, we have two variations on this variable. First, we distinguish between embassies and consulates and generate two dummy variables indicating a partner country's consulate or embassy in the Chinese province, respectively. Note that all embassies are located in Beijing. Second, we consider only consulates and embassies established before 1992 to deal with the concern that recent diplomatic representations are established due to economic besides political reasons. Data on the list of foreign consulates and embassies and their respective establishment year are from MFA (2020).

Number of sister linkages This variable is based on a dataset of 2,310 sister relationships at the provincial and lower levels (including prefectures and counties) by the end of 2015 from Li et al. (2015) and compiled by Liu and Hu (2018). For our analyses, we build on a continuous indicator of the number of sister relationships of various administrative units within a country established with administrative units in China (at the provincial or lower administrative levels). In robustness checks, we have two variations on this variable. First, we distinguish between upper- and lower-level links. Upper-level sister links are the ones that are built with Chinese provinces or comparable administrative entities. The latter includes 15 large cities that are either provincial capitals or ones with provincial-level authority over economic issues: Changchun, Chengdu, Dalian, Guangzhou, Hangzhou, Harbin, Jinan, Nanjing, Ningbo, Qingdao, Shenyang, Shenzhen, Wuhan, Xi'an, and

Xiamen. Lower-level links are the ones at the prefectural city level or below. Second, we consider only sister linkages built before 1992 as earlier built sister links are more likely to reflect historical political and not economic ties.

Past trade linkages We measure the average value of total imports and exports between 2017 and 2018 for each province-country pair. The original trade data from China Customs (GACC 2020b) are at the monthly level. We first aggregate import and export values to the yearly level and then calculate the average for the years 2017 and 2018. To account for 0 trade values, we transform both variables by the inverse hyperbolic sine function.

Past inward FDI This variable measures the average annual value of inward foreign direct investment inflows into each province originating from each of the partner countries from 2015 to 2017, measured in US$. This measure is transformed by the inverse hyperbolic sine function to account for 0 values.

Source: China's Ministry of Commerce (MOFCOM 2019).

Past donations This variable refers to the first pandemic months January to March 2020 and records the US$ value of total aid imports to each Chinese province from each partner country. Donations refer to imports under the custom regimes "Aid or Donation between Governments and International Organizations" (code 11) and "Other Donations" (code 12). The measure is transformed via an inverse hyperbolic sine function to account for 0 values.

Source: Official Monthly China Customs Statistics (GACC 2020b).

COVID-19 infection rates This variable computes the number of infections per 10 million people by the end of April 2020 and is transformed by an inverse hyperbolic sine function. It provides us with a proxy for the early spread of the pandemic in each importing country and captures the demand for face masks in the early period of the COVID-19 outbreak.

Source: Open COVID-19 Dataset (Wahltinez 2020).

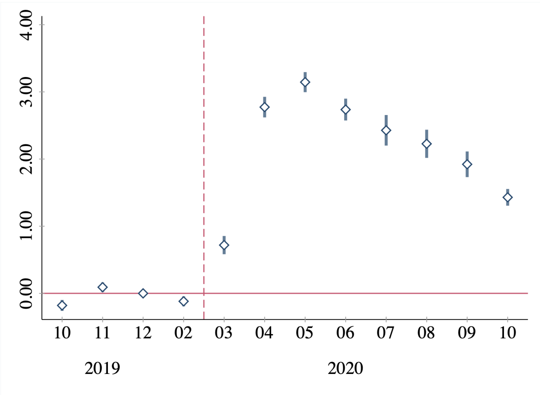
Gravity controls Data on partner-country GDP in constant US$ and the population size are accessed via *wbopendata* (Azevedo 2011) and always refer to the latest available year (until 2019). Partner country's geographic distance is measured from China's most populous city, Shanghai. *Contiguity* is a binary variable for a common border with China. *Common language* indicates countries speaking Chinese. *RTA* indicates whether China and each trade partner are in the same regional trade agreement. GDP, population size, and distance are measured in natural logarithm.

Source: World Bank (2020) for GDP and population, and CEPII (Mayer and Zignago 2011) for distance, contiguity, common language, and RTA.

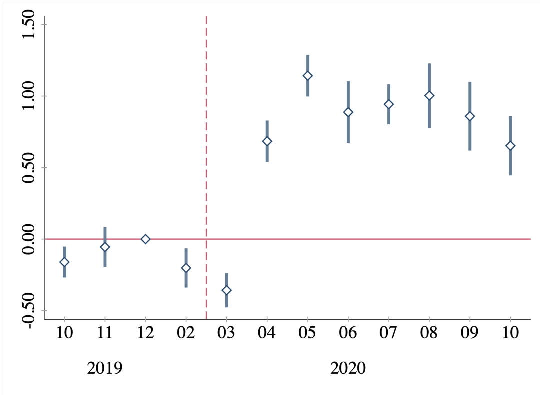
SOE share This variable measures the output share of centrally controlled state-owned enterprises (SOE) in total provincial output for the industrial sector. It is calculated based on the firm-level data of the Annual Survey of Industrial Enterprises (ASIE) in 2014, collected by the National Bureau of Statistics (NBS) of China and distributed by RESSET. Centrally controlled SOEs are the ones affiliated with the central government.

Source: RESSET (www.resset.com)

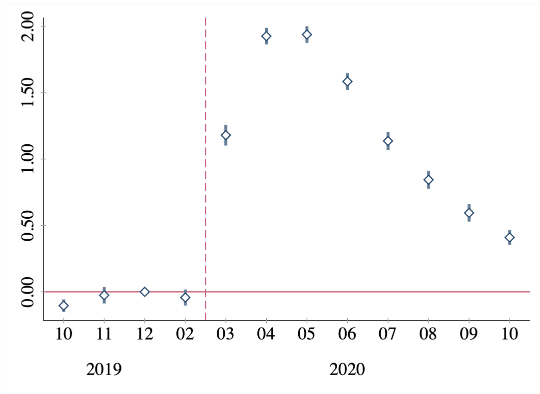
B Figures



(a) Export Value



(b) Export Quantity



(c) Export Price

Figure B.1: Event study estimates of face mask exports between January 2019 and December 2020 (alternative control group)

Notes: This figure plots coefficient estimates and the corresponding 95% confidence intervals of a difference-in-differences model of dyadic exports of face masks as compared to non-critical medical products. Regressions control for province-time, country-time, and province-country-HS 8-digit product fixed effects. Coefficient estimates in Figures B.1a and B.1b are estimated using PPML; in Figure B.1c using OLS. The reference month is December 2019; the first coefficient combines all prior months beginning with January 2019, whereas the last coefficient combines October to December 2020. January 2020 in the figure represents January and February as the raw customs data combine data of these two months. We combine data of January and February of 2019 to keep consistency.

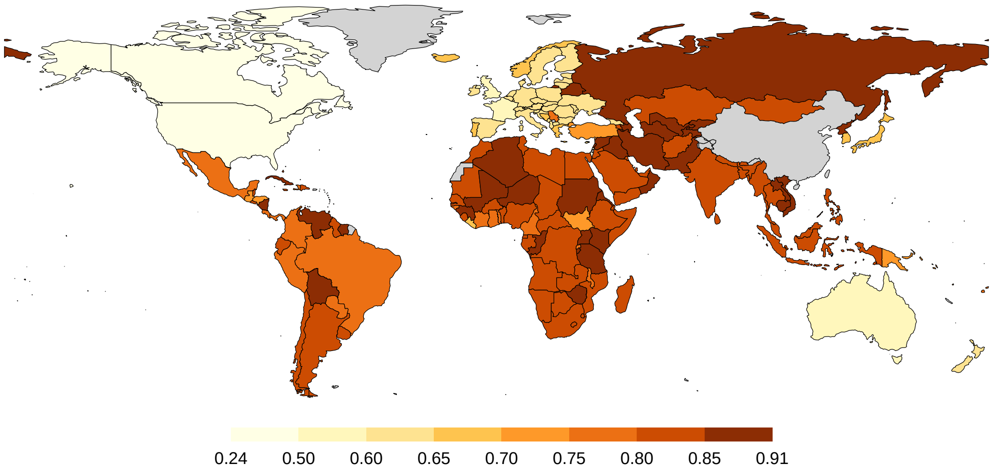


Figure B.2: Voting alignment with China at the UN General Assembly, 2017–2019
Notes: The map shows the average voting agreement with China in the UN General Assembly for each country between 2017 and 2019. Source: Bailey et al. (2017).

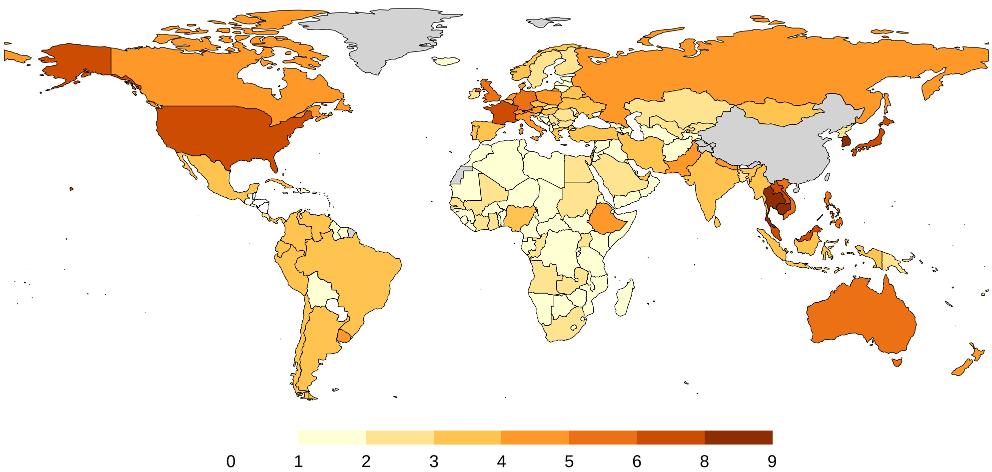


Figure B.3: Number of diplomatic missions in China by country
Notes: The map shows the number of diplomatic representations in China by country. If equal to one, the country only has an embassy in Beijing. Source: MFA (2020).

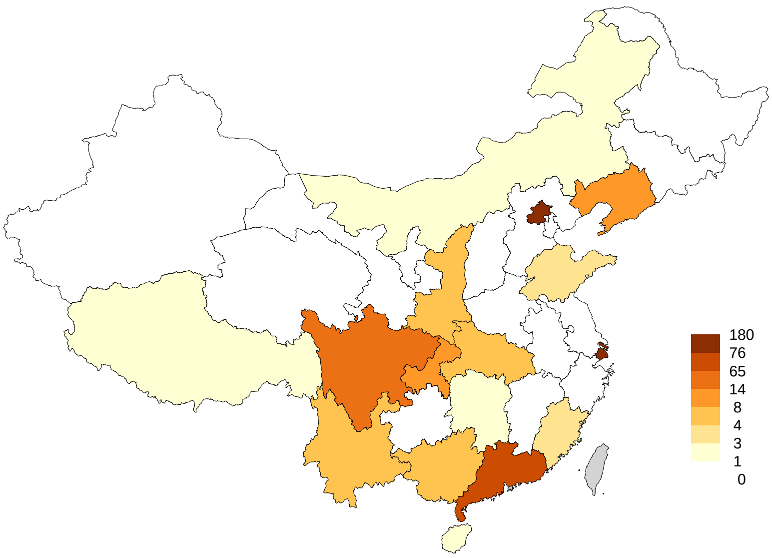


Figure B.4: Number of diplomatic missions in China by Chinese province
Notes: The map shows the number of diplomatic representations by Chinese province. All representations in Beijing are embassies. Source: MFA (2020).

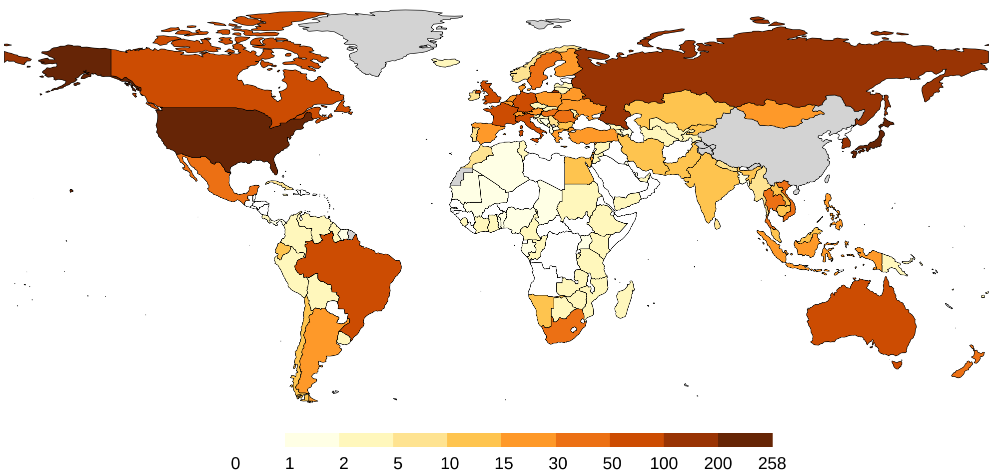


Figure B.5: Number of sister linkages with Chinese subnational entities by country
Notes: The map shows the number of sister linkages with Chinese subnational entities by country. Source: Li et al. (2015) and Liu and Hu (2018).

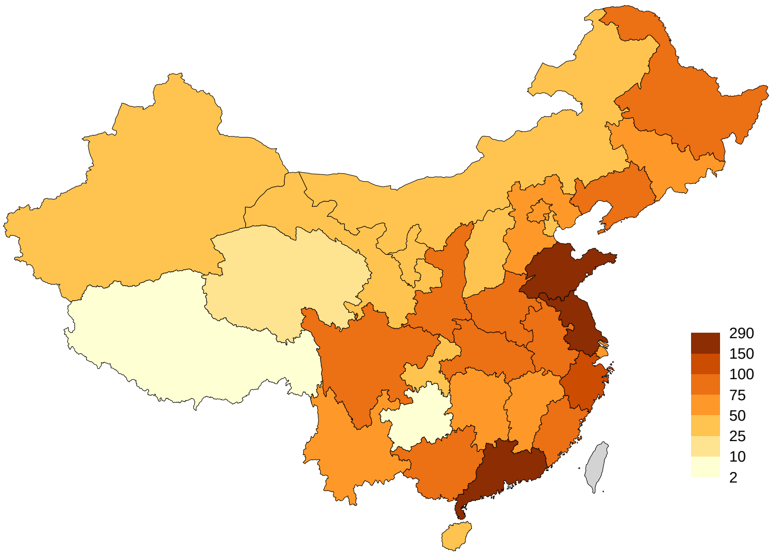


Figure B.6: Number of sister linkages with foreign subnational entities by Chinese province
Notes: The map shows the number of sister linkages with foreign subnational entities by Chinese province. Source: Li et al. (2015) and Liu and Hu (2018).

C Tables

Table C.1: Top 20 export destinations of face masks from China

ISO3	Value			Quantity			Price			UN voting	COVID
	2019	2020	Δ	2019	2020	Δ	2019	2020	Δ	agree	infections
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
USA	567.41	7471.01	6903.59	98.68	178.39	79.70	5.75	41.88	36.13	0.24	59.49
DEU	67.01	3373.08	3306.07	11.57	41.91	30.33	5.79	80.49	74.70	0.63	45.85
FRA	30.95	2526.27	2495.32	5.32	29.72	24.40	5.82	85.01	79.19	0.59	46.44
JPN	111.10	2556.87	2445.78	13.17	57.34	44.17	8.44	44.59	36.15	0.68	2.03
GBR	64.52	1559.06	1494.54	10.54	27.35	16.81	6.12	57.00	50.88	0.57	44.56
ITA	17.14	1188.82	1171.68	2.88	11.46	8.58	5.95	103.74	97.78	0.64	81.40
CAN	37.18	1067.90	1030.71	6.57	19.56	12.98	5.66	54.61	48.95	0.50	24.46
ESP	18.63	828.35	809.72	3.15	12.10	8.95	5.91	68.44	62.52	0.65	118.11
NLD	49.64	834.40	784.76	10.45	19.12	8.67	4.75	43.64	38.89	0.64	49.29
RUS	10.49	570.15	559.67	2.06	13.19	11.13	5.09	43.23	38.13	0.87	7.03
SGP	8.64	549.69	541.05	0.95	7.08	6.14	9.10	77.59	68.49	0.85	32.36
BEL	14.31	477.60	463.29	2.55	8.18	5.64	5.61	58.36	52.74	0.65	86.11
AUS	33.22	459.92	426.70	6.59	11.16	4.57	5.04	41.22	36.18	0.53	7.51
KOR	38.72	392.81	354.08	5.01	13.64	8.63	7.72	28.79	21.07	0.66	6.17
MEX	11.85	356.68	344.83	2.60	7.21	4.61	4.55	49.46	44.91	0.77	1.80
CHE	3.52	334.58	331.06	0.41	4.25	3.84	8.53	78.64	70.11	0.64	88.70
ZAF	5.67	336.47	330.80	1.01	5.84	4.83	5.64	57.63	51.99	0.84	1.50
BRA	8.19	317.91	309.72	1.80	4.83	3.03	4.56	65.84	61.29	0.77	4.92
SAU	14.46	289.76	275.30	3.42	10.44	7.02	4.23	27.75	23.52	0.83	7.64
PER	2.46	251.62	249.16	0.57	3.74	3.18	4.35	67.25	62.90	0.80	12.57
Sample average	6.85	159.16	152.31	1.17	3.05	1.88	6.32	58.69	51.58	0.77	14.53
Sample median	0.21	7.13	6.73	0.05	0.14	0.06	5.28	55.11	48.19	0.82	1.81

Notes: The table reports China's top 20 export destinations of face masks in April to June 2019 and the same months in 2020 together with their voting alignment with China in the UN General Assembly in the past (2017–2019) and their COVID-19 infection rate per 10 million inhabitants by the end of April 2020. The rank of countries is based on the change of total export values in the three months in 2019 and 2020 (column 3). Export values are reported in million US$, export quantities are in million kg, and prices are measured as US$/kg. Average and median values indicate the average and median values of each variable, respectively, over 192 countries in the full sample.

Table C.2: Top 20 province-country pairs of face mask exports

Province	ISO3	Value			Quantity			Price			Dip. representation			No. of sister links		
		2019	2020	Δ	2019	2020	Δ	2019	2020	Δ	Any	Embassy	Consulate	Total	Upper	Lower
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Guangdong	USA	104.88	2318.11	2213.23	18.08	41.48	23.40	5.80	55.89	50.08	1	0	1	23	5	18
Zhejiang	USA	141.63	1439.04	1297.42	28.43	47.97	19.54	4.98	30.00	25.02	0	0	0	13	5	8
Jiangsu	USA	145.81	951.40	805.59	21.76	30.86	9.10	6.70	30.83	24.13	0	0	0	35	3	32
Zhejiang	DEU	25.85	816.92	791.07	5.58	12.87	7.29	4.63	63.48	58.85	0	0	0	6	3	3
Guangdong	FRA	3.11	665.37	662.26	0.36	6.59	6.24	8.72	100.93	92.21	1	0	1	5	3	2
Shanghai	USA	53.80	673.56	619.76	7.92	14.49	6.57	6.79	46.48	39.69	1	0	1	3	3	0
Guangdong	DEU	9.10	608.19	599.09	0.96	7.71	6.75	9.48	78.87	69.39	1	0	1	6	3	3
Jiangsu	JPN	17.11	552.07	534.97	1.75	11.69	9.94	9.75	47.23	37.48	0	0	0	35	3	32
Zhejiang	ITA	6.87	531.49	524.63	1.40	4.73	3.33	4.92	112.43	107.51	0	0	0	3	2	1
Fujian	USA	35.74	456.06	420.32	6.48	12.44	5.97	5.52	36.66	31.14	0	0	0	16	4	12
Guangdong	JPN	13.65	426.15	412.51	1.22	9.09	7.88	11.21	46.86	35.64	1	0	1	8	4	4
Hubei	USA	19.00	428.45	409.45	3.57	6.12	2.55	5.32	70.03	64.71	1	0	1	10	3	7
Zhejiang	FRA	11.18	409.49	398.31	2.37	6.51	4.14	4.71	62.91	58.19	0	0	0	5	3	2
Zhejiang	JPN	15.75	391.76	376.01	1.68	9.40	7.72	9.40	41.70	32.30	0	0	0	22	7	15
Shanghai	JPN	21.94	383.56	361.62	2.36	8.55	6.19	9.30	44.89	35.58	1	0	1	7	3	4
Guangdong	SGP	2.37	350.04	347.67	0.33	3.69	3.36	7.17	94.83	87.66	1	0	1	0	0	0
Shanghai	FRA	2.50	348.68	346.18	0.40	2.87	2.47	6.25	121.35	115.10	1	0	1	2	2	0
Shanghai	DEU	3.99	348.64	344.65	0.51	3.53	3.02	7.85	98.75	90.89	1	0	1	3	1	2
Beijing	DEU	0.14	337.36	337.22	0.02	1.82	1.80	7.38	184.99	177.61	1	1	0	2	2	0
Guangdong	GBR	7.36	322.30	314.94	1.02	5.76	4.75	7.22	55.91	48.69	1	0	1	5	2	3
Sample average		0.22	5.13	4.91	0.04	0.10	0.06	11.78	72.66	52.72	0.06	0.03	0.03	0.38	0.16	0.22
Sample median		0.00	0.00	0.00	0.00	0.00	0.00	6.50	61.50	46.61	0	0	0	0	0	0

Notes: The table reports the top 20 province-country pairs with the largest increase of face mask exports between April to June 2019 and the same period in 2020. The rank of province-country pairs is based on the change of total export values reported in column 3. Export values are reported in million US$, export quantities are in million kg, and prices are measured in US$/kg. Diplomatic representation is a binary variable indicating whether a country has an embassy or consulate in the respective province. Upper-level sister links are the ones between foreign countries and Chinese provinces (or comparable administrative entities). Lower-level sister links are the ones between foreign countries and administrative units at the prefectural city level or below. Average and median values indicate the average and median values of each variable, indicated by the column title, over 5,952 country-province pairs in the full sample.

Table C.3: Descriptive statistics of key variables

	(1) Mean	(2) S.D.	(3) Min.	(4) Max.
Masks and made up textiles				
Export value (1,000 US$)	307.618	7190.101	0.000	1092900.423
Mask (=1)	0.333	0.471	0.000	1.000
Masks and non-critical medical products				
Export value (1,000 US$)	5.959	852.169	0.000	1092900.423
Mask (=1)	0.005	0.068	0.000	1.000
Province-country-level variables				
Dip. representation (=1)	0.064	0.244	0.000	1.000
Embassy (=1)	0.030	0.169	0.000	1.000
Consulate (=1)	0.034	0.181	0.000	1.000
Dip. representation before 1992 (=1)	0.028	0.165	0.000	1.000
No. of sister linkages	0.384	1.597	0.000	35.000
No. of upper-level sister linkages	0.162	0.536	0.000	7.000
No. of lower-level sister linkages	0.222	1.244	0.000	32.000
No. of sister linkages before 1992	0.064	0.500	0.000	14.000
asinh Average imports 2017-2018	10.667	8.071	0.000	25.349
asinh Average exports 2017-2018	15.199	5.642	0.000	26.117
asinh Inward FDI	1.662	3.421	0.000	15.117
asinh Donations to China in January-March	1.807	4.260	0.000	17.194
Country-level variables				
UN voting agree with China	0.768	0.113	0.244	0.914
UN voting agree with China (s-score)	0.526	0.207	-0.435	0.824
UN voting ideal point distance	0.663	0.597	0.043	3.121
Average UN voting agree with China before 1992	0.860	0.114	0.248	1.000
asinh COVID-19 infections	1.792	1.698	0.000	6.574
ln Distance	8.998	0.518	6.696	9.868
ln GDP	24.269	2.343	17.567	30.654
Contiguity (=1)	0.073	0.261	0.000	1.000
Common language (=1)	0.010	0.102	0.000	1.000
RTA (=1)	0.119	0.324	0.000	1.000
Province-level variable				
Centrally-controlled SOE output share	0.183	0.130	0.025	0.491

Notes: The number of observations is 107,136 for the sample of masks and made-up textiles (same HS 4-digit subchapter) and 7,678,080 for the mask and the non-critical medical products sample. Export values are reported in 1,000 US$ in this table but measured in US$ in our estimations.

Table C.4: Robustness checks: Alternative measures of UN voting

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
PANEL A						
UN voting ideal point distance × Masks × Post	-0.699***	-0.460***	-0.086	-0.625***	-0.329***	-0.061
	(0.109)	(0.071)	(0.083)	(0.105)	(0.096)	(0.077)
Observations	3,116	3,116	2,543	62,932	61,879	33,921
PANEL B						
UN voting s-score × Masks × Post	1.843***	1.190***	0.187	1.656***	0.903***	0.084
	(0.239)	(0.165)	(0.229)	(0.216)	(0.207)	(0.227)
Observations	3,054	3,054	2,519	61,895	60,848	33,228
PANEL C						
UN voting agree with USA × Masks × Post	-1.237*	-1.226*	-0.055	-0.960	-1.111	0.119
	(0.704)	(0.674)	(0.340)	(0.785)	(0.870)	(0.335)
Observations	3,098	3,098	2,525	61,908	60,879	33,125
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications build on those described in Table 2 but use alternative measures of UN voting alignment. UN voting ideal distance is an estimated measure of *dis*agreement with China during voting sessions in the UN General Assembly, weighting each roll call according to how well they represent the respective countries' main preferences. UN voting s-score measures standardized agreement with China during UN voting sessions. UN voting agree with the United States is the average UN voting similarity index with the United States from 2017 to 2019. All models include the triple interaction term of COVID-19 infection rates, the mask indicator, and the post indicator. Standard errors clustered at the country level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.5: Robustness checks: Controlling for further heterogeneities

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	3.718***	2.062***	0.247	3.252***	1.421***	0.130
	(0.833)	(0.576)	(0.426)	(0.626)	(0.378)	(0.446)
asinh COVID-19 infect. × Masks × Post	0.283***	0.130**	0.184***	0.261***	0.131**	0.124***
	(0.071)	(0.053)	(0.039)	(0.066)	(0.055)	(0.037)
Distance(ln) × Masks × Post	0.228*	-0.077	0.247***	0.055	-0.210**	0.352***
	(0.117)	(0.104)	(0.081)	(0.105)	(0.084)	(0.076)
GDP(ln) × Masks × Post	0.061	0.020	-0.028	0.045	0.017	-0.010
	(0.092)	(0.070)	(0.031)	(0.072)	(0.051)	(0.029)
Contiguity(=1) × Masks × Post	-0.451	-0.120	0.642**	-0.673**	-0.324	0.416*
	(0.482)	(0.342)	(0.262)	(0.325)	(0.244)	(0.242)
Common language(=1) × Masks × Post	0.113	0.416*	-0.291**	0.146	0.537	-0.175
	(0.289)	(0.228)	(0.129)	(0.512)	(0.935)	(0.219)
RTA(=1) × Masks × Post	-0.590***	-0.375**	-0.122	-0.586***	-0.351**	-0.095
	(0.218)	(0.147)	(0.112)	(0.192)	(0.148)	(0.118)
Observations	3,089	3,089	2,532	62,479	61,438	33,791
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications build on those described in Table 2 and add gravity controls, which are interacted with the mask indicator and the post indicator. Standard errors clustered at the country level are reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.6: Robustness checks: Historical political linkages (established before 1992)

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
PANEL A						
UN voting agree bf 1992 × Masks × Post	3.983***	2.488***	-0.137	2.408***	1.617***	-0.222
	(0.756)	(0.592)	(0.229)	(0.413)	(0.434)	(0.166)
Dip. representation bf 1992 × Masks × Post	0.703***	0.463**	0.270**	0.670***	0.213	0.098
	(0.187)	(0.199)	(0.135)	(0.169)	(0.172)	(0.099)
No. of sister links bf 1992 × Masks × Post	0.090***	0.074***	-0.016	0.029	0.053**	-0.021
	(0.027)	(0.022)	(0.015)	(0.024)	(0.023)	(0.013)
asinh COVID-19 infect. × Masks × Post	0.478***	0.203***	0.035	0.271***	0.141***	0.030*
	(0.094)	(0.066)	(0.022)	(0.050)	(0.051)	(0.017)
PANEL B						
UN voting agree bf 1992 × Masks × Post	3.626***	1.992***	-0.071	2.066***	1.143**	-0.099
	(0.901)	(0.599)	(0.231)	(0.536)	(0.485)	(0.209)
Embassy bf 1992 × Masks × Post	2.727***	1.814***	0.320	3.209***	2.161***	0.528***
	(0.423)	(0.458)	(0.222)	(0.325)	(0.363)	(0.156)
consulate bf 1992 × Masks × Post	0.733***	0.517**	0.159	0.425***	0.091	-0.087
	(0.202)	(0.222)	(0.157)	(0.143)	(0.180)	(0.125)
No. lower sister links bf 1992 × Masks × Post	0.106***	0.102***	-0.070**	0.059	0.070**	-0.061**
	(0.034)	(0.027)	(0.028)	(0.037)	(0.031)	(0.025)
No. upper sister links bf 1992 × Masks × Post	0.032	-0.014	0.076	-0.038	-0.009	0.057
	(0.079)	(0.060)	(0.050)	(0.048)	(0.045)	(0.043)
asinh COVID-19 infect. × Masks × Post	0.468***	0.190***	0.033	0.229***	0.058	0.083***
	(0.095)	(0.062)	(0.022)	(0.057)	(0.056)	(0.024)
Observations	30,751	30,585	15,182	235,719	230,933	81,864
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications build on those described in Table 3 but use measures of historical political linkages. UN voting agree before 1992 is the average value of the voting agreement similarity index with China for each country between 1971 and 1991. Diplomatic representation before 1992 is a binary variable indicating whether a country has an embassy or a consulate before 1992 in a Chinese province. No. of sister linkages indicates the number of sister links between each country and each Chinese province before 1992. We further decompose diplomatic representations into embassies and consulates and sister links into lower-level and upper level ones in Panel B. Standard errors clustered at the country-province-product level are reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.7: Robustness checks: Excluding donation exports

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	3.213***	2.482***	-0.035	2.719***	1.940***	-0.051
	(0.457)	(0.394)	(0.288)	(0.371)	(0.410)	(0.210)
Dip. representation × Medical × Post	0.654***	0.611***	0.025	0.685***	0.423***	0.006
	(0.148)	(0.145)	(0.069)	(0.111)	(0.122)	(0.056)
No. of sister linkages × Medical × Post	0.004	0.015**	-0.013**	-0.001	0.013*	-0.013***
	(0.009)	(0.006)	(0.006)	(0.010)	(0.007)	(0.005)
asinh COVID-19 infect. × Masks × Post	0.404***	0.200***	0.047**	0.327***	0.179***	0.041**
	(0.057)	(0.040)	(0.023)	(0.048)	(0.045)	(0.019)
Observations	33,053	32,816	16,032	246,963	241,664	84,351
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications build on those described in Table 3 but rely on non-donation exports. The dependent variables measure the value, quantity, or the natural logarithm of the unit price of non-donation face mask exports from each Chinese province to each partner country. Donations refer to exports under the custom regimes "Aid or Donation between Governments and International Organizations" (code 11) and "Other Donations" (code 12). Standard errors clustered at the country-province-product level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.8: Robustness checks: Excluding the United States

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	1.634**	1.742***	-0.003	1.522***	2.247***	-0.111
	(0.697)	(0.541)	(0.298)	(0.582)	(0.580)	(0.235)
Dip. representation × Masks × Post	0.554***	0.700***	0.027	0.641***	0.587***	0.012
	(0.163)	(0.120)	(0.069)	(0.133)	(0.133)	(0.057)
No. of sister linkages × Masks × Post	0.022**	0.028***	-0.011*	0.016	0.030***	-0.014**
	(0.010)	(0.008)	(0.006)	(0.010)	(0.010)	(0.006)
asinh COVID-19 infect. × Masks × Post	0.420***	0.214***	0.040*	0.327***	0.210***	0.036*
	(0.055)	(0.040)	(0.023)	(0.043)	(0.043)	(0.019)
Observations	33,069	32,842	15,887	239,553	234,501	80,385
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications build on those described in Table 3 but exclude exports to the United States in all specifications. Standard errors clustered at the country-province-product level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.9: Robustness checks: Excluding Beijing and Hubei

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Excluding Beijing						
UN voting agree × Masks × Post	3.181***	2.456***	0.028	2.744***	1.922***	-0.009
	(0.456)	(0.395)	(0.280)	(0.353)	(0.409)	(0.213)
Dip. representation × Masks × Post	0.637***	0.595***	0.027	0.552***	0.372***	-0.017
	(0.149)	(0.146)	(0.071)	(0.109)	(0.120)	(0.060)
No. of sister linkages × Masks × Post	0.004	0.015**	-0.009	0.001	0.014*	-0.011**
	(0.009)	(0.006)	(0.006)	(0.010)	(0.007)	(0.005)
asinh COVID-19 infect. × Masks × Post	0.400***	0.198***	0.035	0.325***	0.173***	0.035*
	(0.057)	(0.040)	(0.023)	(0.048)	(0.045)	(0.019)
Panel B: Excluding Hubei						
UN voting agree × Masks × Post	3.334***	2.530***	0.061	2.694***	1.904***	0.009
	(0.453)	(0.394)	(0.293)	(0.376)	(0.424)	(0.218)
Dip. representation × Masks × Post	0.650***	0.609***	0.079	0.692***	0.423***	0.057
	(0.149)	(0.143)	(0.071)	(0.116)	(0.129)	(0.058)
No. of sister linkages × Masks × Post	0.005	0.016**	-0.009	0.000	0.013*	-0.012**
	(0.009)	(0.006)	(0.006)	(0.010)	(0.007)	(0.006)
asinh COVID-19 infect. × Masks × Post	0.410***	0.198***	0.041*	0.316***	0.165***	0.035*
	(0.057)	(0.041)	(0.024)	(0.050)	(0.046)	(0.019)
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications build on those described in Table 3 but exclude exports from Beijing (panel A) or Hubei province (panel B). Standard errors clustered at the country-province-product level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.10: Dyadic estimation results: Clustering standard errors at the country-province level

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	3.214***	2.485***	-0.015	2.718***	1.940***	-0.032
	(0.463)	(0.352)	(0.296)	(0.412)	(0.407)	(0.215)
Dip. representation × Masks × Post	0.655***	0.611***	0.061	0.686***	0.424***	0.028
	(0.171)	(0.115)	(0.072)	(0.127)	(0.124)	(0.057)
No. of sister linkages × Masks × Post	0.004	0.015*	-0.010	-0.001	0.013*	-0.012**
	(0.012)	(0.008)	(0.006)	(0.011)	(0.007)	(0.006)
ashin COVID 19 infect. × Masks × Post	0.402***	0.200***	0.039	0.326***	0.178***	0.037*
	(0.065)	(0.046)	(0.024)	(0.052)	(0.045)	(0.019)
Observations	33,495	33,268	16,229	247,483	242,171	84,572
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications closely follow those in Table 3. Columns 1, 2, 4, and 5 are estimated using PPML and columns 3 and 6 using OLS. Standard errors clustered at the country-province level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.11: Mechanisms: Dyadic estimation results for existing trade partners

Control group	Other made-up textile products			Non-critical medical products		
	Value	Quantity	Price	Value	Quantity	Price
	PPML	PPML	OLS	PPML	PPML	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
UN voting agree × Masks × Post	3.235***	2.472***	-0.030	2.764***	1.986***	-0.029
	(0.445)	(0.385)	(0.283)	(0.380)	(0.411)	(0.211)
Dip. representation × Masks × Post	0.652***	0.607***	0.060	0.671***	0.378***	0.027
	(0.148)	(0.145)	(0.070)	(0.113)	(0.123)	(0.057)
No. of sister linkages × Masks × Post	0.004	0.015**	-0.010*	-0.007	0.007	-0.012**
	(0.009)	(0.006)	(0.006)	(0.010)	(0.007)	(0.005)
asinh COVID-19 infect. × Masks × Post	0.407***	0.200***	0.036	0.323***	0.164***	0.037**
	(0.057)	(0.040)	(0.023)	(0.049)	(0.047)	(0.019)
Observations	22,378	22,197	14,203	173,294	170,320	77,965
Country-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-product-province FE	Yes	Yes	Yes	Yes	Yes	Yes
Two-way interactions	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Specifications closely follow those in Table 3. Regression sample is constrained to country-province-HS 8-digit product triplets that had positive exports in April to June in 2019. Columns 1, 2, 4, and 5 are estimated using PPML and columns 3 and 6 using OLS. Standard errors clustered at the country-province-product level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.12: List of treatment and control products

No.	HS 8-digit code	Product descriptions
TREATMENT GROUP		
1	63079000	Made up articles, nes (including masks)
CONTROL GROUP 1: PRODUCTS WITHIN THE SAME HS4 CATEGORY		
1	63071000	Floor-cloths, dish-cloths, dusters & similar cleaning cloths
2	63072000	Life-jackets & life-belts
CONTROL GROUP 2: NON-CRITICAL MEDICAL PRODUCTS		
1	28421000	Double or complex silicates
2	28429011	Sodium thiocyanate
3	28429019	Fulminates, cyanates and thiocyanates, nes
4	28429030	Lithium nickel cobalt manganese oxide
5	28429040	Lithium Iron Phosphate
6	28429050	Selenate and selenite
7	28429060	Lithium nickel cobalt aluminum oxides
8	28429090	Other salts of inorganic acids or peroxoacids (excl.ãzides)
9	29029010	Tetrahydronaphthalene
10	29029020	Naphthalene
11	29029030	Dodecyl benzene
12	29029040	Napthalene, pure
13	29029050	Isobutyl benzene
14	29029090	Other cyclic hydrocarbons, nes
15	29037100	Chlorodifluoromethane
16	29041000	CH derivatives with only sulpho groups, their salts/ethyl esters
17	29052210	Geraniol
18	29052220	Citronellol
19	29052230	Linalool
20	29052290	Acyclic terpene alcohols, nes
21	29052900	Unsaturated monohydric alcohols, nes
22	29061910	Terpineols
23	29061990	Cyclanic, cyclenic or cycloterpenic alcohols & derivatives, nes
24	29062910	2-Phenylethyl alcohol
25	29062990	Aromatic alcohols, nes
26	29072910	Pyrogallic acid
27	29072990	Other polyphenols, nes; phenol-alcohols
28	29091910	Methyl ether
29	29091990	Other acyclic ethers & their hal./sul./nit./nits. derivs, nes
30	29093010*	1-Alkoxy-4-(4-vinylcyclohexyl)-2,3-difluorobenzene
31	29093020	4-(4-alkoxy)-4'-N-alkenyl-1,1'-and Fluoro derivatives of cyclohexane
32	29093090	Other aromatic ethers & their hal./sul./nit./nits. derivs
33	29094910	m-Phenoxylbenzalcohol
34	29094990	Other ether-alcohols & their hal./sul./nit./nits. derivs, nes
35	29095000	Ether-phenols, ether-alcohol-phenols & their hal./sul./nit./nits. derivs
36	29122910	Lilial (p-tert-butyl-a-methyl-oxocinn amaldehyde)
37	29122990	Other cyclic aldehydes, without other oxygen function, nes
38	29124910	Aldehyde-alcohols
39	29124990	Aldehyde-ethers, aldehyde-phenols and aldehydes with other oxygen function, nes
40	29141900	Other acyclic ketones, without other oxygen function, nes
41	29144000	Ketone-alcohols & ketone-aldehydes
42	29146200	Coenzyme Q10 (ubidecarenone (INN))
43	29153900	Other esters of acetic acids, nes
44	29155010	Propionic acid
45	29155090	Salts & esters of propionic acid
46	29159000	Saturated acyclic monocarboxylic acids & their hal./sul./nit./nits. derivs, nes
47	29161900	Unsaturated acyclic monocarboxylic acids & their derivatives, nes
48	29162010	Dibromo chrysanthemic acid, DV-chrysanthemic acid monomethyl ester
49	29162090	Cyclanic, cyclenic/cycloterpenic monocarboxylic acids, derivs, nes
50	29163910	m-Methylenzoic acid

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Table C.12 – List of treatment and control products (continued)

No.	HS 8-digit code	Product descriptions
51	29163920	Brufen (ibuprofen)
52	29163930	2-(3-iodo-ethylphenyl)-propionic acid
53	29163990	Aromatic monocarboxylic acids,anhydride/halide/pero- xide/xyacid, derivs, nes
54	29171310	Sebacic acid, their salts & esters
55	29171390	Azelaic acid, their salts & esters
56	29171900	Acyclic polycarboxylic acids, anhydride/peroxide & derivs, nes
57	29173410	Dibutyl orthophthalates
58	29173490	Other esters of orthophthalic acid, nes
59	29173910	m-Phthalic acid
60	29173990	Armtc polycarboxylic acids, anhydride/halide/pero- xide/xyacid, derivs, nes
61	29181100	Lactic acid, its salts & esters
62	29181300	Salts & esters of tartaric acid
63	29181600	Gluconic acid, its salts & esters
64	29181700*	2,2-Diphenyl-2-hydroxyacetic acid (benzilic acid)
65	29182210	O-Acetylsalicylic acid
66	29182290	O-Acetylsalicylic acid salts & esters
67	29182300	Other esters of salicylic acid & their salts
68	29182900	Carboxylic acids with phenol function, no othr oxygen function, derivs, nes
69	29183000	Carboxylic acids with aldehyde, ketone, no othr oxygen function, derivs
70	29202100	Dimethyl phosphite
71	29211200	2-(N, N-Dimethylamino)ethylchloride hydrochloride
72	29212900	Acyclic polyamines & their derivatives, nes; salts thereof
73	29213000	Cyclanic, cyclenic /cycloterpenic mono- or polyamines; derivs; salts thereof
74	29214200	Aniline derivatives & their salts
75	29214910	p-Isopropyl-aniline
76	29214920	Dimethylaniline
77	29214930	2, 6-methyl ethyl aniline
78	29214940	2, 6-Diethylaniline
79	29214990	Aromatic monoamines & their derivatives, nes; salts thereof
80	29215900	Aromatic polyamines & their derivatives, nes; salts thereof
81	29221100	Monoethanolamine and its salts
82	29222910	Anisidines, dianisidines, phenetidines, & their salts
83	29222990	Aminona- & amino-phenols, with one oxygen function; ether/ester/salt, nes
84	29224110	Lysine
85	29224190	Lysine esters & salts
86	29224911	Tranexamic acid
87	29224919	Amino-acids, nes
88	29224991	Procaine
89	29224999	Amino-acids esters, 1 oxygen function; salts thereof, nes
90	29225010	p-Hydroxyphenylglycine and its potassium salts
91	29225090	Amino-alcohol/acid-phenols; amino-compounds with oxygen functn, nes
92	29231000	Choline & its salts
93	29233000	Tetraethylammonium perfluorooctane sulphonate
94	29242500	Alachlor (ISO)
95	29251900	Imides & their derivatives; salts thereof (excl.s̃accharin)
96	29264000	alpha-Phenylacetoacetonitrile
97	29270000	Diazo-, azo- or azoxy-compounds
98	29280000	Organic derivatives of hydrazine or of hydroxyiamine
99	29299010	Sodium cyclamate
100	29299040	Acephate
101	29299090	Compounds with other nitrogen function, nes
102	29329910	Furan phenol
103	29329920	Biphendate
104	29329930	Artemether
105	29329990	Othr heterocyclic compounds with oxygen hetero-atom only, nes
106	29331100	Phenazone (antipyrin) & its derivatives
107	29332100	Hydantoin & its derivatives
108	29332900	Compounds containing an unfused imidazole ring in the structure, nes
109	29335910	Cytosine
110	29335920	Ciprofloxacin

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Table C.12 – List of treatment and control products (continued)

No.	HS 8-digit code	Product descriptions
111	29335990	Compounds with a pyrimidine or piperazine ring, nes
112	29336910	Cyanuric chloride
113	29336921	Dichloroisocyanurate acid
114	29336922	Trichloroisocyanurate acid
115	29336929	Other dichloroisocyanurate
116	29336990	Compounds with unfused triazine ring in the structure, nes
117	29362100	Vitamins A & their derivatives, unmixed
118	29362200	Vitamin B1 & its derivatives, unmixed
119	29362300	Vitamin B2 & its derivatives, unmixed
120	29362400	D- or DL- Pantothenic acid (Vitamin B3 or B5) & their derivatives
121	29362500	Vitamin B6 & its derivatives, unmixed
122	29362600	Vitamin B12 & its derivatives, unmixed
123	29362700	Vitamin C & its derivatives, unmixed
124	29362800	Vitamin E & its derivatives, unmixed
125	29362900	Other vitamins & their derivatives, unmixed, nes
126	29369010	Vitamin AD3
127	29369090	Other vitamines (incl.ñatural concentrates), nes
128	29371100*	Somatotropin, its derivatives and structural analogues
129	29371210	Recombinant human insulin and its salts
130	29371290	Other insulin and its salts
131	29371900	Polypeptide hormones, protein hormones and glycoprotein hormones, nes
132	29372100	Cortisone, hydrocortisone, prednisone & predisolone
133	29372210	Dexamethasone
134	29372290	Halogenated derivatives of adrenal cortical hormones, nes
135	29372311	Progesterone conjugated equine estrogen
136	29372319	Other oestrogens and progestogens
137	29372390	Other oestrogens and progestogens
138	29372900	Halogenated derivatives of corticosteroidal hormones, nes
139	29375000	Prostaglandines, thromboxanes and leukotrienes, their derivatives
140	29379000	Other hormones, natural or reproduced by synthesis, nes
141	29381000	Rutoside (rutin) & its derivatives
142	29389010	Zidovudine, lamivudine, stavudine, didanosine and their salts
143	29389090	Other glycosides & its salts, ethers,esters & other derivatives
144	29391100	Concentrates of poppy straw; buprenorphine, INN and slats thereof
145	29391900	Alkaloids of opium & their derivatives; salts thereof
146	29392000	Alkaloids of cinchona & their derivatives; salts thereof, nes
147	29393000	Caffeine & its salts
148	29394100	Ephedrine & its salts
149	29394200	Pseudoephedrine (INN) & its salts
150	29395900	Theophylline & aminophylline & derivatives & salts
151	29396300*	Lysergic acid & its salts
152	29396900	Other alkaloids of rye ergot & their derivatives, salts, nes
153	29397910	Nicotine and its salts
154	29397990	Other alkaloids of vegetal origin, natural/reproduced by synthesis, and their salts/ethers/esters/other derivatives
155	29400010	Xylose
156	29400090	Other Sugars,chemically pure, nes; sugar ethers, sugar acetals and sugar esters, and their salts, other than products of 29.37,29.38 or 29.39
157	29411011	Ampicillin
158	29411012	Ampicillin trihydrate
159	29411019	Ampicillin salts
160	29411091	Amoxylillin
161	29411092	Amoxycillin trihydrate
162	29411093	6-Aminopenicillanic acid
163	29411094	Penicillins V
164	29411096	Cloxacillin
165	29411099	Penicillins & derivs with a penicillin acid structure; salts; nes
166	29412000	Streptomycins & their derivatives; salts thereof
167	29413011	Tetracycline
168	29413012	Tetracycline salts

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Table C.12 – List of treatment and control products (continued)

No.	HS 8-digit code	Product descriptions
169	29413020	Tetracycline derivatives & their salts thereof
170	29414000	Chloramphenicol and its derivatives; salts thereof
171	29415000	Erythromycin & its derivatives; salts thereof
172	29419010	Gentamicin & its derivatives; salts thereof
173	29419020	Kanamycin & its derivatives; salts thereof
174	29419030	Rifampicin & its derivatives; salts thereof
175	29419040	Lincomycin & its derivatives; salts thereof
176	29419052	Cefalexin & its salts
177	29419053	Cefazolin & its salts
178	29419054	Cefradine & its salts
179	29419055	Ceftriaxone & its salts
180	29419056	Cefoperazone & its salts
181	29419057	Cefotaxime & its salts
182	29419058	Cefaclor & its salts
183	29419059	Cephamycin & its derivatives; salts thereof, nes
184	29419060	Midecamycin & its derivatives; salts thereof
185	29419070	Acetyl spiramycin & its derivatives; salts thereof
186	29419090	Other antibiotics, nes
187	29420000	Other organic compounds, nes
188	30021100	Malaria diagnostic test kits
189	30064000	Dental cements & other dental fillings; bone reconstruction cements
190	30066010	Contraceptive preparations based on hormones
191	30066090	Other chemical contraceptive prep. based on hormones or spermicides
192	30069100	Appliances identifiable for ostomy use
193	30069200	Waste pharmaceuticals
194	32030011	Natural indigo & preparations thereof
195	32030019	Other colouring matter of vegetable origin, & prep., nes
196	32030020	Colouring matter of animal origin, & prep.
197	32041911	Sulphur black & prep.s based thereon
198	32041919	Other sulphur dyes & prep. based thereon
199	32041990	Other synthetic organic colouring matters & prep., nes
200	87131000	Wheelchairs not mechanically propelled
201	87139000	Wheelchairs, mechanically propelled
202	90063000	Cameras for special use, underwater, aerial survey, etc
203	90184100	Dental drill engines
204	90184910	Dentists' chairs with dental equipment
205	90184990	Dental instruments & appliances, nes
206	90185000	Ophthalmic instruments & appliances, nes
207	90211000	Orthopaedic or fracture appliances
208	90212100	Artificial teeth
209	90212900	Dental fittings, nes
210	90213100	Artificial joints
211	90213900	Artificial parts of the body, nes
212	90214000	Hearing aids, excluding parts & accessories
213	90219011	Stents in blood vessel
214	90219019	Other stents
215	90219090	Appliances worn, carried or implanted in the body, nes
216	90221300	X-ray apparatus for dental use
217	94021010	Barbers' chairs & parts thereof
218	94021090	Dentists' chairs or similar chairs & parts thereof

Notes: This table presents the list of products in the treatment and control groups. Control group 1 includes products within the same HS 4-digit subchapter (6307) as face masks. Control group 2 includes non-critical medical products, defined as the list of medical products in Helble (2012) excluding critical medical products for COVID-19 defined by the Chinese government (GACC 2020a) or by the World Customs Organization (WCO) and the World Health Organisation (WHO) (WCO/WHO 2020). Products with $*$ are the ones on the list of non-critical medical products but were not traded in April–June 2019 and 2020.