BU Global Development Policy Center

Policy Responses to COVID-19

Lessons for the Global Trade and Investment Regime

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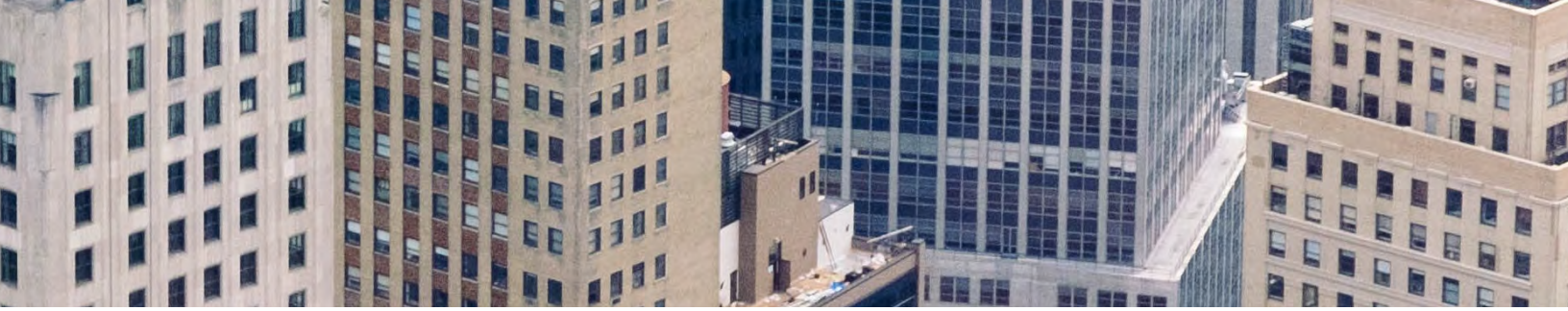

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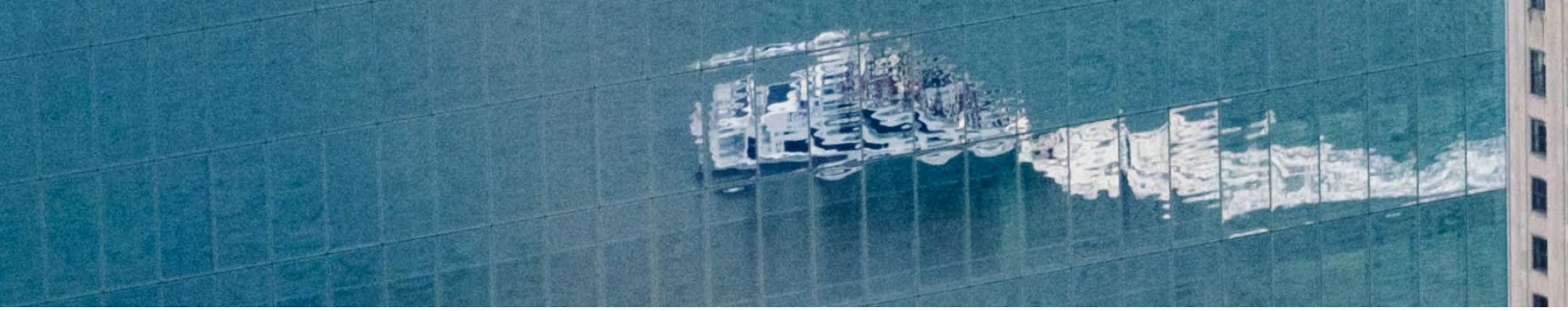
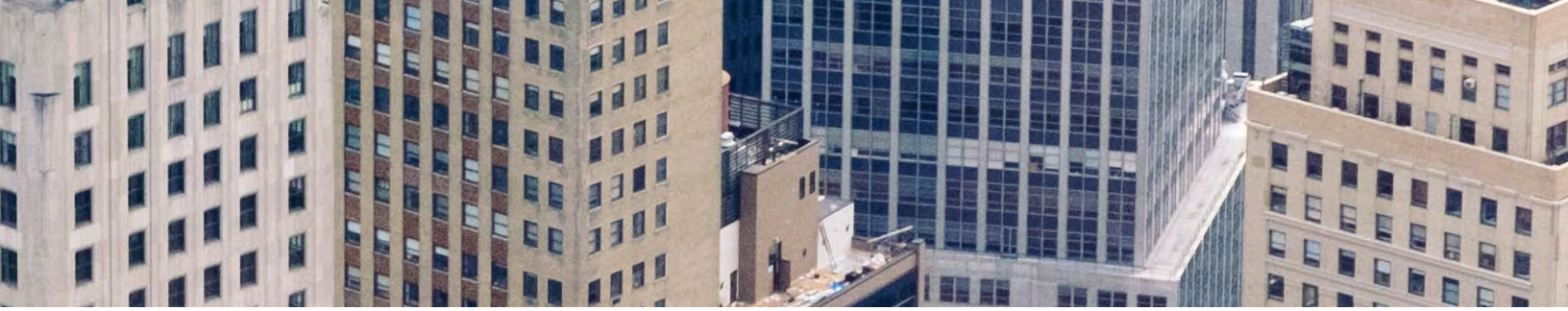


Abbreviations

BIT	Bilateral investment treaty
CL	Compulsory license
DSU	Dispute Settlement Understanding (WTO)
FDI	Foreign direct investment
FTA	Free trade agreement
GATS	General Agreement on Trade in Services (WTO)
GATT	General Agreement on Tariffs and Trade (WTO)
GDP	Gross domestic product
GPA	Government Procurement Agreement (WTO)
GTA	Global Trade Alert
ISDS	Investor-state dispute settlement
LDC	Least developed country
PPE	Personal protective equipment
SCM	Agreement on Subsidies and Countervailing Measures (WTO)
TRIMs	Agreement on Trade-Related Investment Measures (WTO)
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property (WTO)
USMCA	United States-Mexico-Canada Free Trade Agreement
VL	Voluntary license
WHO	World Health Organization
WTO	World Trade Organization



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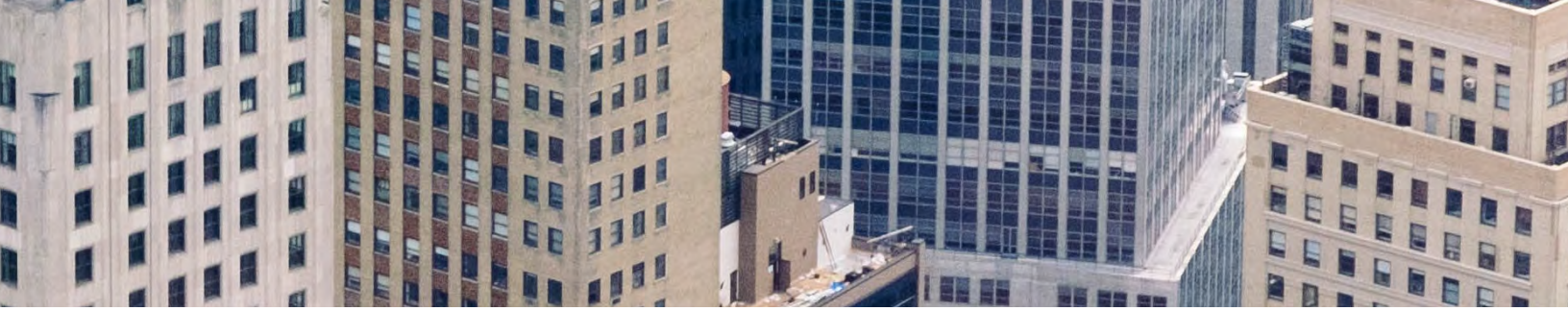
CAPE GRACE



CHAPTER 1

EXECUTIVE SUMMARY

During the past two years, as COVID-19 has taken millions of lives around the globe, governments everywhere have attempted to quickly mobilize to mitigate the health, social and economic impacts of the pandemic. COVID-responsive policy interventions ranging from subsidies to trade restrictions, and investment measures to government procurement initiatives, have taken precedence over traditional policy preferences that would favor market-oriented approaches. In many cases, these emergency measures also appear to contravene the trade rules embodied in the World Trade Organization (WTO) agreements, free trade agreements and international investment agreements.

From a trade policy perspective, the interventions taken to mitigate the impact of COVID-19 present an important opportunity to identify aspects of existing trade rules that may interfere with appropriate pandemic crisis responses and to identify areas where those rules should be reformed. These mitigation actions taken by governments should be viewed as a reflection of a variety of tensions and trade-offs, namely between national-level and global-level health needs, between private interests in profits and expansion of market share and public interests in broad-based access to diagnostics, treatment and vaccines, and between the need for efficiency in manufacturing and distribution of those COVID-19 products and their equitable availability.

This report investigates the relationship between global trade and investment rules and government policy responses by studying a sample group of six large countries – the United States, Germany, France, China, South Africa and India. It seeks to test whether the current rules, had they not been ignored or violated, would have constrained the policy space in which governments were operating and whether there remains a risk of legal challenge in international tribunals for the present suite of crisis measures.

We do not evaluate the efficacy of each policy intervention, as our purpose is to assess the extent of this tension between global trade, intellectual property and investment rules and national interests in policymaking.

KEY FINDINGS

- All of the countries in the study implemented trade measures, whether anti-dumping measures, or some form of export and import restrictions to maintain control over domestic supply of essential and strategic products. Similarly, measures to more tightly regulate foreign investment became commonplace in several countries in our study.

- Subsidies were the most common form of intervention to support both the pharmaceutical industry and the economy more generally, as demand for COVID-19 products skyrocketed and much of the rest of the economy struggled to maintain stability.
- The US and India wielded their purchasing power to secure access to treatments and vaccines through public procurement.
- Only France and Germany pursued policy changes to intellectual property protection through changes in legislation related to compulsory licensing.
- China, India and South Africa relied relatively more heavily on tariffs and quantitative restrictions than on subsidies, possibly due to fiscal resource constraints.
- India deployed the greatest number of distinct types of interventions, with 31 distinct types in 170 interventions, and South Africa used the fewest distinct types of interventions, at 10 distinct types in 33 interventions.
- The US implemented the most measures of any country studied, with 476 interventions.
- Perhaps a surprising outlier, China implemented the fewest number of policy interventions at 32, which may suggest either that China had existing measures in place to mitigate the pandemic effects, or that the particular interventions invoked by the Chinese government were not included in the dataset due to availability.
- The existing global rules constrain many of the policy interventions catalogued, including subsidies, tariffs, government procurement and export restrictions.

KEY RECOMMENDATIONS

Given the potential constraints global trade and investment rules present to policymaking and considering the tensions and trade-offs in policymaking decisions, we propose policy recommendations along three trajectories: to end the COVID-19 pandemic; to build long-term health resilience globally; and to facilitate general economic development and resilience world-wide. These recommendations would require changes at both the global institutional level and within the domestic policies of individual countries, and they require action in the near-term, as well as the long-term.

To meet the immediate needs of all countries in response to the current pandemic:

- Members of the WTO should negotiate and come to an agreement to waive key provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) for COVID-19 related products.
- High-income countries should leverage their in-kind contributions and high levels of demand to require innovators to share their technology and know-how with manufacturers in low- and middle-income countries.

- Low- and middle-income countries should encourage domestic development and reverse engineering of innovative technologies.
- Other international organizations, such as the World Health Organization (WHO), should continue efforts to support low- and middle-income countries in these efforts.

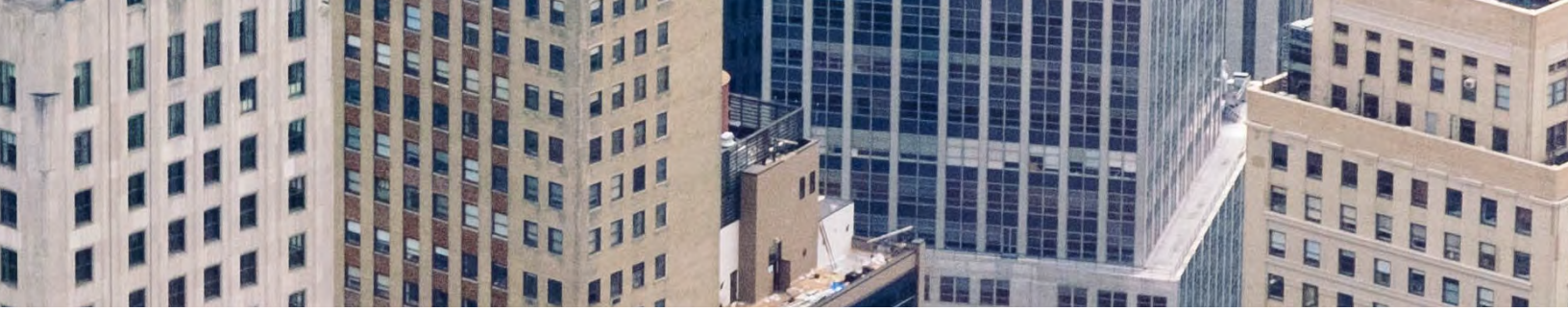
To build resilience for the next and future pandemics:

- Members of the WTO and other trade and investment agreements should advocate for and negotiate to preserve and expand policy space for building and sustaining adequate domestic health sectors within each country.
- Regional country groups should collaborate to create structures for regional production hubs with strong accountability mechanisms.
- Low- and middle-income countries should take an active role in building up their own health sector resilience while advocating for change at the WTO and elsewhere.

To enable future economic resilience and equity:

- Members of the WTO should seek to negotiate greater recognition of the primacy of public welfare goals – including health, equity, environmental and development goals – in the text of the WTO and other trade agreements.
- Countries that are parties to agreements with investor-state dispute settlement should either renegotiate or withdraw from them to restore the balance between public and private interests in international economic law.
- Country-members of all trade and investment agreements should seek to expand the flexibility to act in the public interest to facilitate economic growth, sustainable development and resilient healthcare systems.

In all, our research finds the tension between government policy interventions and the rules of international trade and investment has risked greater health inequality around the world, not to mention economic instability and widening the gap between low- and high-income countries. Rather than constrain, trade and investment agreements should recognize that government actions to protect human well-being, achieve greater social equity and protect the planet are higher order priorities and as such should be exempt from challenges under those agreements.



CHAPTER 2

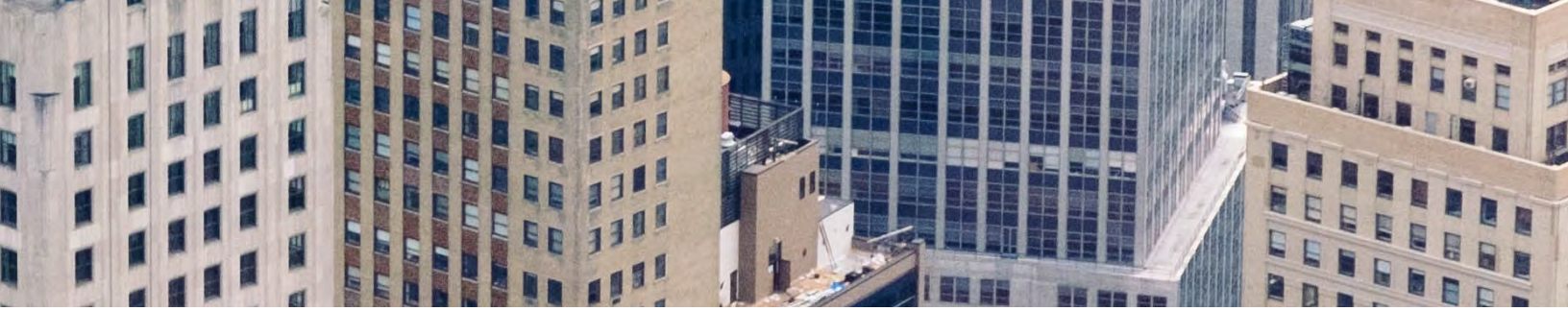
INTRODUCTION: GOVERNMENT POLICY RESPONSES TO THE COVID-19 PANDEMIC

During the past two years, the COVID-19 pandemic has cost millions of lives around the globe, caused major morbidity and provoked widespread economic and social disruption (Gurgula 2021). Governments have enacted many policies to mitigate the health, social and economic impact of the pandemic. These policies range from subsidizing the domestic production of goods such as personal protective gear and financing the development of vaccines, to promoting domestic consumption through income support for households or workers, to providing financial and other support to businesses.

These policy interventions took precedence over traditional policy preferences in countries that favor market-oriented approaches. In many cases, the emergency health and economic measures would also appear to contravene provisions of global trade rules and investment treaties. These changes in priorities during an acute crisis, such as the pandemic, illustrate that the commitment to the current rules of global trade is not immutable. From a trade policy perspective, the actions taken to mitigate the impact of the COVID-19 pandemic present an important opportunity to identify aspects of current trade rules that could impede appropriate crisis responses and to address areas where those rules and corresponding institutions should be reformed.

It is essential to recognize that the policy choices made by governments during the pandemic involve tensions and trade-offs between various policy goals and public health needs. Many of them involve legal and even ethical questions. In particular, we identify and discuss tensions and trade-offs along three different dimensions: between national- and global-level pandemic responses; between public and private interests; and between efficiency and equity concerns. In order to investigate the relationship between global trade and investment rules and government policy responses to the COVID-19 pandemic, our research tests the following hypotheses: (1) if certain governments had not ignored or violated existing trade and investment rules, some of these rules would have constrained the measures taken to deal with the pandemic crisis; and (2) the countries taking such measures could still be challenged by other governments, investors or property rights holders under these same trade and investment rules. In effect, we are asking to what extent the global rules governing trade, investment and intellectual property would have, or could constrain countries in responding to this and future crises, and what reforms of the system may be necessary to increase flexibility and resilience.

The report begins by describing the landscape of these crisis measures - in particular identifying the nature and scope of the policies implemented by a sample group of countries during this period. It then seeks to identify any global rule-based constraints that could apply to the responsive policies, either in trade or trade-related areas. Once identified, the report explores further the trade-offs and tensions involved along the three dimensions mentioned above. It concludes with policy suggestions for national governments, international institutions and other stakeholders to improve the capacity of trade and investment regimes to support crisis response and to strengthen countries' policy space for long-term economic and health system resilience.



CHAPTER 3

METHODOLOGY

POLICIES OF INTEREST

This study focuses on the following two policy categories: (1) policies to increase production of or access to key COVID-19 related products (e.g., health technologies, diagnostics, personal protective equipment, treatments and vaccines); and (2) policies to support private firms and industries affected by the economic impact of the pandemic and/or to encourage development of production capacity in certain sectors. Some of these policies are, for obvious reasons, focused particularly on health products, while others seek to more generally alleviate the economic stress brought on by the pandemic, such as supply chain bottlenecks or sudden decreases in demand. In each of these categories the policies of particular interest for our research are those policies which subsidize specific firms or industries, put up new barriers to trade or discriminate against imported goods, foreign services and foreign investment, as these are the policies most likely to be constrained by existing trade and investment rules.

We excluded policies aimed at domestic behaviors, such as social distancing, mask mandates, stay-at-home orders, school closures, vaccine rollouts and travel restrictions, as well as measures expanding social safety nets or providing income support to workers or households. This research does not encompass those measures, as such policies typically are not governed by or addressed under trade and investment treaties. Furthermore, some countries also put in place measures to maintain financial stability in the midst of the economic impact of the crisis, which may conflict with rules governing capital flow regulation. Many have written on the importance of capital flow regulation and the challenges of rules limiting that policy space (Ostry et al. 2010, Jeanne et al. 2011, Coelho and Gallagher 2013, IMF 2020). Given the breadth of that topic and our space limitations, we have chosen to omit the discussion here.

DATA SOURCES

In order to catalogue the policies of interest, we gathered information from web-based databases that track the government interventions during the pandemic. The methodological appendix provides a description of the sources, the data provided and our validation approach.

We selected the Global Trade Alert (GTA) database as our primary data source for reasons detailed in the appendix and downloaded all policies categorized in the GTA as "harmful/discriminating" and

"likely harmful/discriminating" toward trade openness or foreign products and services. We included measures beginning on March 1, 2020, as indicative of the beginning of government awareness and intervention in response to the pandemic that were still in force as of August 31, 2021.

We selected six large countries for our study whose actions could be systemically significant: United States, Germany, France, China, South Africa and India. The data also included, aside from the country implementing the intervention, a list of countries impacted by a given intervention. For a given country, we counted the total number of unique state acts catalogued by the database and the total number of interventions of a given policy type in addition to the number of different policy intervention types.

INTERVENTION TYPES AND THE CURRENT TRADE AND INVESTMENT RULES

We categorized the 37 intervention types identified in the GTA for that period into four broad categories: subsidies, trade measures (tariffs and quantitative restrictions), investment measures and public procurement (see Table 1). The broader categories allow us to assess the state acts in terms of the main constraints imposed by current trade and investment rules. When an intervention was typically labelled differently in sources outside of the GTA we re-categorized it accordingly. For instance,

Table 1: Government Interventions in Four Broad Categories

Subsidies	Tariffs and quantitative restrictions	Investment measures	Public procurement, purchase agreements
Capital injection & equity stakes	Anti-dumping	FDI*: Entry and ownership	Public procurement access
Financial grant	Anti-subsidy	FDI: treatment and operations	Public procurement localization
In-kind grant	Export ban	Local sourcing	Public procurement preference margin
Interest payment subsidy	Export licensing requirement	Localization incentive	Public procurement, other
Loan guarantee	Export quota	Local operations	
Price stabilization	Export tax		
Production subsidy	Export-related non-tariff measure		
State aid	Import ban		
State loan	Import licensing requirement		
Tax or social insurance relief	Import monitoring		
Trade finance	Import quota		
	Import tariff		
	Import tariff quota		
	Import-related non-tariff measure		
	Safeguard		
	Tax-based export incentive		

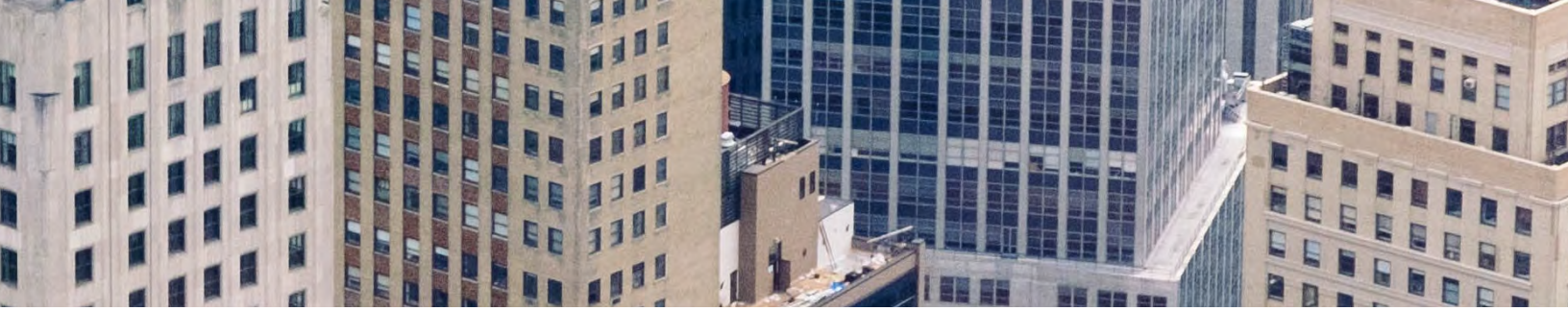
*FDI = Foreign direct investment

Source: Global Trade Alert (GTA) 2021; Authors' categorization.

our team chose to categorize US subsidies to private production of vaccines as production subsidies rather than the GTA's choice to put them into the more amorphous state aid category.

Once categorized, we used a purposive sample of policy acts in each of the four categories for each of the countries based on their prominence in trade and health policy literature and reporting. Examples of such prominent policies are India's licensing requirement for exports of Amphotecerin B, the US, EU and Indian government support for vaccine development and the US, EU and South African airline support measures.

We compared these acts with the existing treatment standards for foreign goods, services and investment at the WTO including under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), the Agreement on Subsidies and Countervailing Measures (SCM) and the Government Procurement Agreement (GPA). We also compare them against similar rules in preferential and free trade agreements (FTAs) and bilateral investment treaties (BITs).



CHAPTER 3

FINDINGS: CATALOGUE OF POLICY INTERVENTIONS AND RELEVANT RULE-BASED CONSTRAINTS

DESCRIPTIVE LANDSCAPE OF POLICY INTERVENTIONS

Our research found that the types of intervention policies deployed during the pandemic were quite diverse, ranging from policies aimed at increasing access to COVID-19 related health products to those aimed at mitigating the economic impacts of the pandemic by shoring up weak firms or domestic sectors.

Table 2 provides a quantitative overview of the number of distinct policy interventions, sectors and countries affected by those interventions, and how many were aimed at the health sector, specifically (columns 2-5).[1] The table also divides the interventions into our four broad categories to show which types of policy interventions were most prevalent by each country (columns 6-9). For our sample group of large countries, subsidy policies were the most numerous and among the most diverse, encompassing targeted subsidies to domestic producers, capital injections into private firms, government advance purchase agreements for vaccines and treatments, changes to tax laws to incentivize new domestic production (e.g., tax breaks) and government investment in research and development for key innovations. Tariffs and quantitative restriction policies followed close behind, including import and export restrictions, import and export licensing requirements, tariff quotas, trade monitoring requirements and anti-dumping and countervailing duties. Investment measures, although usually a broad category in policymaking, included only a short list of new rules governing foreign direct investment, local sourcing and localization incentives. Public procurement policies governing direct government purchases of goods and services were less extensive and included access rules, localization requirements and preference margin incentives.

Our research also looked at policies directly relevant to the health demands of the pandemic that could be constrained by trade policies related to intellectual property, such as those found in the WTO TRIPs agreement. We found very few interventions in this category, which could include use or expansion of flexibilities to issue compulsory licenses, or actually issuing them. For example, France and Germany each made subtle changes to their laws.

[1] "Health Sector Interventions" are interventions which impact a combined grouping comprised of nine sectors chosen by the authors: (1) basic organic chemicals, (2) basic inorganic chemicals n.e.c, (3) miscellaneous basic chemical products, (4) pharmaceutical products, (5) chemical products n.e.c, (6) medical & surgical equipment and orthopaedic appliances, (7) instruments and control equipment, except optical instruments, (8) petroleum, chemical and pharmaceutical manufacturing services, (9) human health services..

Table 2: Quantitative Overview

Country (by nominal GDP per capita)	# of Interventions Enacted[2]	# of Sectors Affected	# of Countries Affected	# of Health Sector Interventions (as % of total interventions)	# of Subsidies	# of Tariff and QR[3] policies	# of Investment Measures	# of Public Procurement Measures
USA	476	132	156	70 (14.7%)	319	81	10	66
Germany	263	131	157	27 (10.3%)	161	32	70	0
France	160	183	151	38 (23.8%)	123	31	6	0
China	32	131	171	7 (21.9%)	10	19	3	0
South Africa	33	83	107	5 (15.2%)	15	18	0	0
India	170	117	171	56 (32.9%)	51	87	17	15

Sources: GTA 2021; Authors' calculation.

Table 2 highlights a few key findings, in particular the types of policy interventions preferred by high-income countries compared to countries with lower per capita income. We see that the number of interventions enacted is somewhat correlated with the nominal GDP per capita of each country, the US dominating the list with 476 distinct policies. The US also implemented the greatest number of health-sector focused policies, relying primarily on subsidies. For the three high-income countries in our sample, subsidies were by far the most common policy tools used, while procurement and investment measures were less common. In contrast, China, India and South Africa relied relatively more heavily on trade policies like tariffs and quantitative restrictions than on subsidies, perhaps because of fiscal resource constraints. India's interventions focused more heavily on the health-sector, although these measures still made up a minority of its interventions. India led in the number of countries impacted by its policies and France led in the number of sectors affected. Perhaps a surprising outlier, China implemented the fewest number of policy interventions during the time period, which may suggest either that China had existing measures in place that were suitable to mitigate the pandemic effects, or that the particular interventions invoked by the Chinese government were not included in the GTA database due to availability.

Table 3 breaks the broader intervention types into more specific categories so that we can see the pattern of policy tools that impacted the pharmaceutical sector, as well as the broader health sector category. A few tools are used by most or all countries in our study: state aid or state loans, export licensing requirements, import tariffs and anti-dumping duties. The table again shows the prevalence of subsidies, but now disaggregated to the specific types of measures. We also see that India deployed the greatest number of distinct types of interventions, while South Africa used the fewest. It is also notable that the policy types deployed by France and Germany have the greatest amount of overlap - likely due to their membership in the EU.

[2] All these policies were still in force as of August 31, 2021 and are designated by the GTA as either a "red" intervention, whose implementation almost certainly worsened the relative treatment of some foreign commercial interest or an "amber" intervention, whose implementation likely involves discrimination against foreign commercial interests.

[3] QR = quantitative restrictions

Table 3: Interventions Impacting Pharmaceutical Products[4] and non-Pharmaceutical Health Sectors[5] by Country

Broad Intervention Category	Intervention Types	USA	Germany	France	China	SA	India
Subsidies	Financial grant	*		*			*
	Interest payment subsidy						*
	Loan guarantee		*	*			*
	Production subsidy	*[6]					*
	State aid	*					*
	State loan	*	*	*	*	*	
	Tax or social insurance relief	X		*	*		*
	Trade finance		X				X
Tariffs & quantitative restrictions	Anti-dumping	X	X	X	X		*
	Anti-subsidy	X			X		X
	Export ban						*
	Export licensing requirement	X	*	*	X	*	*
	Export quota						X
	Export-related non-tariff measure, nes	*					*
	Import ban						X
	Import licensing requirement				X		
	Import tariff	X	X	X	X		X
	Import tariff quota		*	*			
	Tax-based export incentive						X
Investment Measures	FDI: Entry and ownership rule		*	*			
	FDI: Treatment and operations, nes	X					
	Local sourcing						X
	Local operations		*	*			
Public procurement & other	Public procurement localization	*					*

Source: GTA 2021; Authors' calculation.

[4] Intervention types that were used specifically to target pharmaceutical products are denoted by an asterix (*). Intervention types that were used to target health sectors not including pharmaceutical products are denoted by an X.

[5] 'All health sectors' is a combined grouping comprised of nine sectors (see above n 1).

[6] In this case, the US provided a production subsidy to private entities our team chose to categorize it that way despite it falling into a different category in the GTA.

Table 4 presents similar data for those policy interventions affecting non-health sectors. We see that use of subsidy instruments is even more prevalent outside the health sectors, including through direct capital injections and equity stakes. All the countries in the sample use state aid and almost all use some form of state loans or loan guarantees and trade finance. All used anti-dumping measures and import tariffs and most also used export licensing requirements. Each of the countries, except South Africa, introduced new or expanded regulation of foreign direct investment (FDI). The US and India were the only countries to intervene through new public procurement measures, with each using a range of policy interventions in this category.

Table 4: Interventions Impacting Non-Health Sectors by Country

Broad Intervention Category	Intervention Types	USA	Germany	France	China	SA	India
Subsidies	Capital injection and equity stakes (including bailouts)		X	X		X	X
	Financial grant	X	X	X			X
	In-kind grant					X	X
	Interest payment subsidy						X
	Loan guarantee	X	X	X		X	X
	Price stabilization	X			X		X
	Production subsidy				X		X
	State aid	X	X	X	X	X	X
	State loan	X	X	X		X	
	Tax or social insurance relief	X		X	X		X
	Trade finance	X	X		X	X	X
Tariffs & QRs	Anti-dumping	X	X	X	X	X	X
	Anti-subsidy	X	X	X	X		X
	Export ban	X				X	X
	Export licensing requirement	X	X		X	X	X
	Export quota						X
	Export tax				X	X	X
	Export-related non-tariff measure, nes	X			X		
	Import ban	X			X		X
	Import licensing requirement	X			X		X
	Import monitoring						X
	Import quota				X		
	Import tariff	X	X	X	X	X	X
	Import tariff quota		X	X			
	Import-related non-tariff measure, nes				X		X
	Safeguard		X	X		X	X
	Tax-based export incentive				X		X

Broad Intervention Category	Intervention Types	USA	Germany	France	China	SA	India
Investment Measures	FDI: Entry and ownership rule	X	X	X	X		X
	FDI: Treatment and operations, nes	X			X		X
	Local operations						
	Local sourcing	X	X				X
	Localization incentive						X
Public Procurement & Other	Instrument unclear	X					
	Public procurement access						X
	Public procurement localization	X					X
	Public procurement preference margin	X					X
	Public procurement, nes						X

Source: GTA 2021; Authors' calculation.

SPECIFIC POLICIES: EXAMPLES AND FINDINGS

Given that the sample countries enacted well over 1,000 policy interventions catalogued by the GTA, we turn to examine a small number of illustrative examples, beginning with government interventions focused in the areas of healthcare and pharmaceuticals. Table 5 presents an illustrative list of such interventions. As noted above, the majority of interventions fall into the subsidies category, which, under the WTO is generally defined as a "financial contribution by a government which confers a benefit" (SCM Art .1). The European Investment Bank loan to BioNTech for research and development on the mRNA platform for the vaccine, as well as the US's direct support to Moderna for the same are among the well-known examples of subsidies in the health sector. However, many other countries provided support for vaccine development (notably India, Russia and China). South Africa was also active in providing funding to businesses acquiring supplies to help with COVID-19 treatment and offering emergency funding to black-owned businesses seeking to fight the pandemic. India announced various support measures for manufacturing medical devices and to increase domestic manufacturing of pharmaceutical products. Many countries also subsidized the acquisition of diagnostic equipment, medical devices (e.g., respirators), personal protective equipment (PPE) and treatment.

Trade measures in the health sector - those targeting imports and exports - largely took the form of export bans or new export licensing requirements for healthcare products for the countries in our study. India imposed a new licensing requirement for exports of Amphotecerin B - a promising treatment of COVID-19 complications, while Germany implemented an export ban on PPE and South Africa introduced export licensing requirements for numerous key COVID-19 products.

Investment measures in the health sector tended to be more diverse in form. India combined a trade measure (export licensing requirement) with an investment measure (local content requirement) by requiring all exported medical coveralls to have a certain percentage of local content or domestic value added. France and Germany both introduced new foreign investment screening mechanisms for firms producing COVID-19 products or, in France's case, for all new firms in the biotech sector. Each of these countries seems to be prioritizing building their local capacity to manufacture these products. In the context of vaccines, localization requirements were common in advanced purchase

agreements made by high-income countries with vaccine producers. The EU (covering Germany and France in our study) required both AstraZeneca and Curevac to manufacture within the EU as a part of the purchase agreement - another way of attempting to ensure access for its citizens through control of production.

Table 5: Illustrative Table of Health-related Policy Interventions

Subsidies	Tariffs and quantitative restrictions	Investment measures	Government Procurement
India supported vaccine development in country (*Economic Times* Nov 2020) European Investment Bank loan to BioNTech for mRNA R&D (EIB June 2020) US support to Moderna from BARDA (Moderna 2020)	India licensing requirement for exports of Amphotecerin B (anti-fungal treatment for complications from COVID-19) - combined with a decrease in import tariff for the same (PIB Aug 2021) India's compulsory domestic sale of vaccines (PIB April 2021)	India financed a hospital rebuilt in Nicaragua and required 75 percent of contract goods to be of Indian origin (Reserve Bank of India 2020) Indian LCR on exports of medical coveralls (also a QR) (Government of India Sept 2021)	India local procurement rules for medical devices (Government of India Feb 2021)
South African Industrial Development Corporation with Department of Trade, Industry and Competition providing funding for businesses' acquisition or production of essential supplies for COVID-19 treatment etc. (IDC 2020) South African emergency funding for Black businesses seeking to fight COVID (National Empowerment Fund 2020)	South African new export licensing requirements for key coronavirus products (S. Af. Dept. of Trade and Industry 2020) German export ban on PPE, etc. (*Reuters* March 2020)	New investment screening regime in Germany for firms producing medical devices, PPE, pharma goods, etc. (Fed. Min. for Economic Affairs and Energy 2020) French foreign investment screening in biotech sector (Min of Econ. Fin. And Recovery 2020)	US procurement of Moderna, Pfizer/BioNTech/J&J vaccines (Moderna 2020, HHS 2020, HHS 2021)
			Localization requirements in EU-Astrazeneca advanced purchase agreement (EC Aug 2020) and Curevac advanced purchase agreement (EC Nov 2020)

Source: GTA 2021.

Perhaps a surprising finding was the absence of changes to intellectual property policies that could increase access to generic diagnostics, treatments and vaccines. Although both France and Germany made subtle legislative changes to make it easier to issue compulsory licenses, neither they nor other countries in our study implemented such licenses.[7]

Table 6 shows examples of interventions outside of the health sector to support the pandemic-affected economy. Again, subsidies played a major role. In terms of sectors addressed, the airline sector suffered major revenue shortfalls due to international border closures and both voluntary and involuntary decisions not to travel and many home countries came to the rescue. Most of the countries in our study - South Africa, the US, France and the EU as a region - introduced support measures for

Table 6: Illustrative Table of Non-health Policy Interventions

	Subsidies	Tariffs and quantitative restrictions	Investment measures	Government Procurement
Sectoral measures	Indian Minimum price support for farmers who sowed winter crops (PIB June 2020)	Indian import ban on defense products beginning in Dec. 2020 (PIB Aug 2020)		US new infrastructure projects subject to Buy America rules (Fed Reg March 2020, Fed Reg June 2020)
	French support for a large number of industrial sectors (BPI France 2020)	US import licensing requirements on aluminum (USITA June 2021)		India local procurement rules for defense sector (PIB May 2020)
	EIB support for smart battery systems - to create a "european battery champion" (EIB Feb 2021)	US import ban on acquisition of bulk-power system electrical equipment from "foreign adversaries" (GTA 2020)		
	US Consolidated Appropriations Act - airline support measures (H.R. 133)			
	South Africa government support for South African Airlines (S. Af. Nat'l Treasure 2021)			
	European Commission support for Lufthansa (EC June 2020)			

(continued)

[7] Notably, these policies are not listed in Table 7 because there were only two of them present in the countries of our study (See WIPO 2021).

Table 6: continued

	Subsidies	Tariffs and quantitative restrictions	Investment measures	Government Procurement
Economy-wide measures	US trade finance support through EXIM to local companies (EXIM n.d.)	China expands list of strategic products subject to import license procedures (HKTDC 2021)	India's review of FDI policy for curbing opportunistic takeovers of Indian companies during pandemic because they are more vulnerable (Govt of India April 2020)	
	US Payroll protection support to businesses (U.S. SBA 2020)		French and German investment reviews affected by new EU investment screening mechanism (EC March 2020)	
	German state aid for struggling companies (EC March 2020)		US increases filing fees for reviews of proposed FDI (Fed Reg April 2020)	
	South Africa loan guarantee scheme for SMEs (Presidency of S.Af. 2020)		China expands scope of FDI subject to "national security review" (Min Com Dec 2020)	

Source: GTA 2021.

their airlines. In other sectors, India provided new minimum price support to farmers, France offered state aid to many industrial sectors, South Africa guaranteed loans to small and medium enterprises, while China, Germany, France and the US offered broad support for struggling companies - such as support for maintaining employment and payrolls, trade finance support and/or preferential loans. All of these governmental actions and financial contributions conferred significant support to their flagging economies.

Tariffs and import or export restrictions were not as common outside of the health sector. India introduced an import ban on defense products to boost the domestic defense sector. The US introduced import licensing requirements on aluminum and imposed an outright ban on acquisition of bulk power systems from "foreign adversaries". Concurrently, China added new strategic products to their list requiring special import license procedures. While these measures and those described in the next paragraph occurred during the pandemic, it is likely that they were enacted more in response to geopolitical concerns than to the economic impacts of the pandemic, per se.

Investment measures took the form of revisions of foreign investment review policies. The US increased filing fees for certain proposed investments, while China expanded the scope of foreign investments subject to "national security review" and India introduced additional reviews of foreign

investors from neighboring countries. In each case, these countries appeared to increase regulation of foreign investment to handle perceived economic vulnerability.

Although the bulk of government procurement measures took place in the health sector, at least two countries in our study introduced new local content rules in public procurement. The US expanded its Buy America rules to new infrastructure projects and India buttressed its support of the defense sector with local procurement rules as well.

GLOBAL RULE-BASED CONSTRAINTS

Each of the countries in our study (indeed, probably all countries) had public health, economic, social and/or political reasons for implementing new policies. However, the policies can be in tension with the global rules governing trade in goods, trade in services and foreign investment. We now introduce the rules that are most relevant to the policy interventions enacted during the pandemic. As shown below, the policies do not necessarily contravene the rules, but all of them are, in some part, regulated by the WTO and other trade and investment agreements.

The WTO's General Agreement on Tariffs and Trade (GATT) prohibits countries from imposing new barriers to trade - either on the export- or import-side - and demands that countries treat foreign goods and investment (through the Agreement on Trade-Related Investment Measures (TRIMs)) on par with their domestic competitors (GATT Arts. II, III, XI; TRIMs Art. 2). The Agreement on Subsidies and Countervailing Measures (SCM) regulates countries' ability to deploy subsidies to support specific sectors, industries and firms. Some subsidies are prohibited, namely those which are contingent on export performance or the use of domestic over imported goods. Subsidies which favor a specific sector, geographical region or individual firm, and which cause injury to other global competitors in a given sector, may violate the rules against specific subsidies (SCM Art. 2) and can be challenged by other WTO member states. The plurilateral Government Procurement Agreement (GPA) largely bans government procurement practices that are non-transparent or discriminate against foreign suppliers and contractors (GPA Art. IV). The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) provides a baseline of intellectual property protection agreed by all WTO members. It requires countries protect pharmaceutical patents for 20 years (TRIPS Art. 27). While there are exceptions for health emergencies, they are circumscribed by complex rules on domestic efforts to issue compulsory licenses to produce products that are scarce or unaffordable (TRIPS Art. 31*bis*). The constraints are particularly onerous when a member state without production capacity requests another country to produce a patented product for its use (TRIPS Art 31*bis*). Narrow exceptions exist to all these rules - permitting "necessary" measures to protect human, animal or plant life or health or to uphold the "essential security" of a country (GATT Arts. XX, XXI). Enforcement, though hamstrung at the moment,[8] is available for countries through the state-to-state Dispute Settlement Body at the WTO (DSU Arts. 4, 6).

The above rules are the most broadly applicable, since 164 of the worlds' countries are WTO members and subject to these standards. They are not the most constraining, however. The plethora of existing bilateral and plurilateral free trade agreements (FTAs) generally prohibit new tariff and non-tariff barriers to trade, while also lowering the baseline of existing tariff bindings (Thrasher and Gallagher 2009). Moreover, modern FTAs and the global network of bilateral investment treaties

[8] At the moment, key WTO members have refused to accept nominations to the Appellate Body, the standing judicial body with the task of resolving disputes once they have been appealed (Wolfe and Mavroidis 2020).

(BITs) broaden sectoral commitments to national treatment and introduce new prohibitions on government regulation (Thrasher 2021). Investment provisions of these agreements and the global network of BITs, grouped under the heading of international investment agreements (IIAs), also provide for investor-state dispute settlement (ISDS) by which private investors can sue their host states in private arbitrations for government regulations claimed to interfere with their investment value (USMCA Art. 14.3, UNCTAD 2021). Government procurement commitments are increasingly making their way into bilateral and regional FTAs - more than 80 countries have included them - which further constrain countries' ability to favor domestic providers through public procurement practices (Gourdon and Messent 2017). Finally, FTAs have introduced "TRIPS-plus" standards which, in practice, extend patent terms, protect clinical trial and other data for longer periods of time and interfere with marketing approvals for generics (Boston University Global Development Policy Center 2019, Labonté et al. 2021).

The EU also has an extensive set of state aid rules that constrain member states' subsidies and related policies, although these were explicitly suspended during the pandemic (European Commission 2021).

POLICIES VS. RULES: THE RELATIONSHIP BETWEEN INTERVENTIONS AND RULE-BASED CONSTRAINTS

It is not always obvious how global trade rules intersect with the particular pandemic-related policies that countries have put in place. However, a few examples serve to demonstrate how conflicts can arise. Table 7 presents illustrative policies enacted during the pandemic and explores how they may run up against various rules prevalent in the trade and investment regime.

SUBSIDIES

The WTO's Agreement on Subsidies and Countervailing Measures (SCM) lays down disciplines for government support of industries, though it does not prohibit it outright. Specific subsidies - those targeting a specific firm, sector or geographic area - can be subject to legal action, either through a WTO dispute or unilateral trade remedies,[9] provided the complaining country can prove injury to their domestic industry, "nullification or impairment" of their expected benefits under the suite of WTO Agreements or serious prejudice in the market (SCM Art. 5). In this context, the US support for Moderna, the EU's support for BioNTech, state support for development of vaccines in India and China, as well as similar vaccine development support by the UK and Russia would undoubtedly fall into the category of specific subsidies. When challenging, the complaining countries would have to show injury to their domestic sector, which may also be the beneficiary of domestic support.

The chances of these rules giving rise to a dispute at the WTO, or even a unilateral trade remedy process, may seem low, given the widespread use of these policies during the pandemic. However, there are examples of long-running disputes between the US and Canada,[10] the US and the EU (Reuters

[9] This would be a domestic process of complaint by the domestic industry, investigation and findings with respect to the impact on the domestic industry. Although the remedies are governed by domestic law, the SCM Agreement provides guard rails to make sure those processes are fair, transparent and consistent with the general standards governing subsidies (SCM Part V).

[10] See various disputes about Canadian and US lumber industries at DS236, DS247, DS257, DS264, DS277, DS311. https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds257_e.htm

2021),[11] and the US and India (Suneja 2019)[12], which would suggest that countries are sometimes quite willing to take aim at other countries' policies that are similar to their own. Even so, given the current urgency of the situation and the fact that every country in the world has been forced to rely on the success of a few vaccine developers, disputes over violations of rules on state aid with respect to vaccines seem unlikely to arise in the short term.

Nevertheless, once the urgency of the pandemic begins to wane and the existing firms seek to consolidate or expand their share of the market, WTO disputes and domestic investigations into subsidies and countervailing measures are likely to make an appearance. In particular, countries attempting to build up long-term health resilience by supporting their nascent pharmaceutical industries will find themselves constrained by the rules that do not allow them to cause injury to incumbent firms and industries in other countries or serious prejudice to the pharmaceutical market more generally. The more successful they are in launching new or expanded domestic industries, the more likely it will be that they become mired in disputes.

As noted above, the EU has suspended their rules restricting state aid within the region during the pandemic, acknowledging that government support is essential in a crisis. As with the WTO rules, however, the challenge will arrive if some countries, still confronting the worst of the pandemic, continue to provide specific support to healthcare and pharmaceutical firms, while other EU countries consider the crisis essentially over. In that case, the re-imposition of the EU's strict rules may block policies both for addressing the immediate crisis and for long-term planning and preparation.

IMPORT AND EXPORT BARRIERS

GATT Article XI lays out the baseline rule prohibiting any new trade barriers "other than duties, taxes or other charges, whether made effective through quotas, import or export licenses or other measures" (GATT Art. XI:1). Paragraph two provides exceptions, however, for export restrictions "temporarily applied to prevent or relieve critical shortages… of essential products" (GATT Art. XI:2), as well as a handful of other specific carve outs for other kinds of trade restrictions.

Export barriers have been particularly pronounced aspects of many countries' approach to the pandemic, and especially to the scarcity of supply of key COVID-19 products. India and South Africa both introduced new export licensing requirements for COVID-19 health products, India's for a specific treatment and South Africa's more broadly applicable. Shortly after the pandemic began, Germany imposed an outright ban on exporting PPE and India addressed a vaccine shortage by introducing a rule of "compulsory domestic sale" for vaccines (effectively an export ban). In each instance, these policies would almost certainly fall under the general prohibition on non-tariff barriers (XI:1), although they might well qualify for the exception for relieving critical shortages in essential products (XI:2), as long as they are only temporary.

Import bans introduced by these countries are more controversial. Unlike the export-related policies they are unlikely to fall within the specific exceptions in Article XI:2. India's ban on imported defense products is explicitly aimed at building up a domestic defense industry, a form of industrial strategy that has been generally frowned upon in international trade policy thinking—at least prior to the pandemic. The US policies blocking or limiting imports of aluminum and acquisition of bulk power

[11] See various disputes about airplane subsidies in the US and the EU at DS 316, https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds316_e.htm.

[12] See the tit-for-tat dispute between India and the US at DS456 and DS510.

system electrical equipment, as well as US and Chinese policies introducing new import licensing requirements seem, or even claim, to be regulations put in place for security or geopolitical reasons, which would test the national security exception of Article XXI of the GATT. Regional and bilateral FTAs also contain prohibitions on new non-tariff barriers to trade that tend to mirror both the rules and the exceptions of Article XI (e.g., USMCA Art. 2.11). General and security exceptions may apply in limited ways to these measures as well and are discussed below.

INVESTMENT MEASURES

The rules governing treatment of foreign investors and their investments are arguably the most complex discussed here. Under the WTO, the TRIMs Agreement requires at its most basic that the GATT standard of national treatment and prohibition on new non-tariff barriers applies not only to trade measures but to investment measures as well (TRIMs Art. 2). In this way, any measure that shapes the investment environment in a way that restricts imports or exports, or prefers local to imported products is likely to violate the agreement.

Many foreign investment measures are not so transparent, however. When India undertook to protect their vulnerable domestic firms across sectors by protecting them from "opportunistic takeover" by foreign firms, they did so by limiting FDI specifically from their geographic neighbors (Bangladesh and Pakistan) through a special government review process. Although not explicitly a matter of national treatment or trade restrictions, the measure could have a de facto negative impact on those potential investors, as well as on existing investors doing business in India. China, the EU and the US each introduced new investment review policies which could have a negative impact on some foreign firms compared with their domestic or other foreign competitors. The US did so through increased filing fees, China through increasing the sectors that require a national security review and the EU through a more general investment screening mechanism.

The health sector investment measures would also be suspect under TRIMs, including India's imposition of local content requirements on medical coveralls, German and French introduction of new foreign investment screening in the health and biotech sectors and the EU's localization requirement for firms negotiating advanced purchase agreements, including Astrazeneca and Curevac. Local content requirements are specifically spelled out in TRIMs as prohibited measures and localization requirements are likely to have a similar impact on the use of imported vs. domestic products.

International investment agreements (IIAs) often have much deeper commitments than those at the multilateral level, in terms of the scope, the specificity and the enforcement of the rules. While TRIMs applies only to investment measures related to trade in goods, the protections in IIAs typically apply to all sectors where foreign investors are present. In some cases, protection extends to investors prior to their formal entry into the host state. In addition, intellectual property is often included as a protected investment, such that violating intellectual property rights also falls under the authority of these treaties. Furthermore, specific prohibitions such as restrictions on capital transfers or performance requirements for investors limits the range of policy tools at a government's disposal for managing crises even more. Localization requirements, for example, while they may represent a *de facto* violation of TRIMs, are expressly prohibited in most IIAs.

Finally, the ISDS prevalent in IIAs provides a unique opportunity in international law for investors to sue national governments outside of their domestic courts. Many have written to critique such a system and a full analysis is beyond the scope of this research (Schultz and Dupont 2014, Wellhausen 2016, Sweet, Stone and Saltzman 2017). Suffice it to say that allowing private stakeholders to sue on

the basis of a treaty removes the ordinary checks and balances of state-to-state dispute settlement mechanisms where diplomatic or public welfare concerns sometimes act as mitigating considerations for states deciding whether to bring a complaint.

GOVERNMENT PROCUREMENT

The Government Procurement Agreement (GPA) is a plurilateral agreement within the WTO, meaning that the commitments therein apply only to the 48 member states that have joined the agreement (and any others that join in the future). The general rules are not extensive. They require that members do not discriminate against the products, services and firms of fellow members in their procurement decisions, and that those decisions are made transparently (GPA Art. IV.1, IV.4). As with many trade and treaty commitments, however, the devil is in the details - or in the schedules. The US, for example, has not made any commitments with respect to state or local governments, so that those entities may make their own decisions about whether to comply with the GPA rules in purchasing (CRS 2019). The federal level schedule of commitments does include a range of agencies that purchase medical supplies and pharmaceuticals for the government (Reinsch, Hoffner and Caporal 2020). As such, government advance purchase agreements with vaccine suppliers is likely to be covered by the GPA. Notably, the GPA only applies with respect to fellow member states, which means, practically, that the US does not have to extend the same treatment to China as it does to EU states, Canada and others.

The US made a number of other changes to domestic procurement during the pandemic as well - making certain infrastructure projects subject to Buy America local sourcing thresholds and increasing those thresholds across the board. If it were not for the ways that the US funnels government purchasing through state and local governments, these measures would quickly run up against their commitments in the GPA and in other FTAs. India is only an observer to the GPA and therefore not bound by its rules. However, India's procurement decisions to increase local content rules for their defense sector, as well as for medical devices, would violate GPA commitments if it was a signatory.

Many FTAs have more in-depth government procurement commitments - that is, more sectors covered by non-discrimination and transparency rules - than what has been negotiated at the WTO. As such, they are likely to involve even greater constraints on public procurement decisions. The US has seen the challenges that this presents, and in the process of NAFTA's renegotiation, eliminated government procurement commitments with Canada, reverting to the GPA rules in the USMCA, although US commitments with Mexico, which is not a GPA member, still stand (Reinsch, Hoffner and Caporal 2020).

COMPULSORY LICENSING

The WTO TRIPS agreement, as expanded by the 2001 Doha Declaration on the TRIPS agreement and public health, provided countries with the possibility to issue compulsory licenses (CLs) for production of essential medicines, products and treatments. Given the explicit rationale for CLs, they might have seemed the most obvious first step for a country attempting to manage a pandemic. Many countries had, and continue to have, difficulty gaining access to diagnostic equipment, PPE, treatments and, more recently, vaccines. While compulsory licensing would not have eased supply chain bottlenecks completely, it might have expanded manufacturing of key products earlier in the pandemic. Nevertheless, only three countries have issued CLs for pandemic-related products, and only ten (including two in our study) made administrative changes to their domestic law to make CLs easier to issue in the future (WIPO 2021).

This is due in part to the complexity of CL regulation within the TRIPS Agreement. While a country with existing manufacturing capacity may be able to issue a CL for a product covered by a patent to a domestic firm relatively quickly in an emergency, the patent landscape more typically makes the process both complex and iterative. COVID-19 products are often covered by many different patents, filed in a number of different countries, and as such CLs are not a simple way to meaningfully expand production (Gaviria and Kilic 2021). Moreover, those products cannot be exported easily. A revision to Article 31 (Article 31*bis*) allows countries without manufacturing capacity to import from another country, however, the process is burdensome, requiring both countries to issue a CL, along with other administrative barriers (Baker 2021).

To complicate matters further, companies in the US and Europe have routinely pressured their governments to punish countries for issuing CLs on their products. The US has repeatedly put pressure on India for its CL on an expensive cancer drug, claiming that India is "diluting" intellectual property rights and violating the TRIPS Agreement (MSF 2018). Private pharmaceutical companies and US lawmakers have taken action to threaten sanctions against India through the United States Trade Representative's (USTR) "Special 301" Report, a trade watch-list of sorts. Colombia faced similar backlash when they took the first steps toward issuing a CL for Glivec, a leukemia treatment. Both Novartis, the patent holder, and the Swiss government argued forcefully that CLs are "tantamount to expropriation" – alleging that Colombia had exercised a sort of eminent domain through regulation (Goldman and Balasubramaniam 2015). More recently, Malaysia attempted to use a CL to increase affordability of a Hepatitis C medication and once more the US, together with its pharmaceutical industry, threatened to wield the power of sanctions through its "Special 301" Report (New 2019). During the pandemic, Russia issued a CL for domestic production of the anti-COVID-19 drug remdesivir (Veklury®) after Gilead Sciences, the patent holder, refused a voluntary license. Gilead has now sued in the Russian Supreme Court (The Pharma Letter 2021). As a result of these and other instances, countries have, understandably, been reluctant to use the existing flexibilities and domestic CL policies.

EXCEPTIONS

As noted above, there are exceptions to these rules that might make space for policies - especially in circumstances of emergency. GATT Article XX provides a list of general justifying exceptions such as measures "necessary to protect human, animal or plant life or health" (XX(b)), restrictions on exports to "ensure essential quantities of those materials" (XX(i)) and measures "essential to the acquisition or distribution of products in general or local short supply" (XX(j)). Although these justifications could be interpreted quite broadly - especially sub-paragraph (b) – the overarching conditions of the Article's introductory paragraph require that measures taken under the exceptions must be applied in a way that does not constitute arbitrary or unjustifiable discrimination or a disguised restriction on trade. The jurisprudence under the WTO has applied these requirements in ways that pose obstacles to otherwise justified or justifiable public policies.

The following article, Article XXI, allows WTO members to take "any action which [they] consider necessary for the protection of [their] essential security interests (iii) taken in time of war or other emergency in international relations" (XXI(b)(iii)). This exception may be interpreted more broadly or flexibly since it does not contain the limiting introductory language of Article XX. Similar general exception and essential security language is found in the General Agreement on Trade in Services (GATS Arts. XIV, XIV*bis*), the TRIPS Agreement (TRIPS Art. 73) and the GPA (Art. 11). Both the TRIMs

and SCM Agreements are under the GATT umbrella, so the general and security exceptions would apply directly and automatically to them. Outside of the WTO, FTAs also tend to retain the language of general and security exceptions. A previous study by one of the authors found that almost half of all preferential trade agreements notified to the WTO contain an essential security exception similar to that of GATT Article XXI (Thrasher, Sklar and Gallagher 2019).

In the context of desperate, immediate needs of people in the midst of a pandemic, subsidies to support vaccine development and production or export restrictions, for example, could very likely be justified under existing rules and exceptions. In the midst of a crisis, they are not likely to be challenged. It is in the policy interventions with longer-term goals and long-term impacts where these exceptions are not as likely to provide shelter.

Table 7: Illustrative Typology of Policies and the Provisions They May Violate

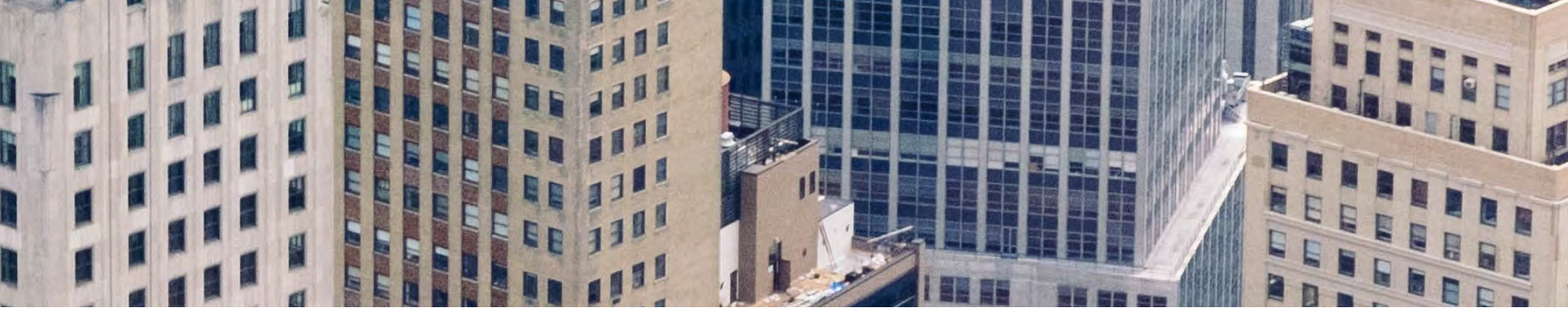
Policy Type	WTO Rule (citation)	FTA rule (example)
Subsidies: US, EU, Indian government support for vaccine development (Moderna, Pfizer/BioNTech, Covaxin) South Africa support for firms producing COVID-19 supplies Sector specific support to airlines (US, EU, South Africa)	SCM Arts. 1 (definition of subsidies), 5 (adverse effects of 'specific' subsidies): Specific subsidies are actionable if they cause injury to foreign competitors	None beyond the WTO rules.
Import/Export Restrictions: New export licensing measures (South Africa, India) New export bans on COVID-19 products (India - vaccines, Germany - PPE)	GATT Article XI: No quantitative restrictions on trade - import or export, except where there are "critical shortages of essential goods"	EU-Ukraine Art. 271 USMCA Art. 2.11 CPTPP Art. 2.10 (adopting and incorporating GATT Article XI) RCEP Art. 2.17 (adopting and incorporating GATT Art. XI)
Investment Measures: Indian local content requirement on medical coveralls France and Germany: New foreign investment screening in health and biotech sectors General changes to FDI screening in India (avoid opportunistic takeovers) and EU, US (increased fees) and China (national security review)	TRIMs Art. 2, Annex: No measures which require foreign investors to use local content or export a certain % of their goods	All including right of establishment: EU-Ukraine Art. 88 (national treatment) USMCA 14.4 (national treatment), 14.10 (performance requirements) CPTPP 19.4 (national treatment), 19.10 (performance requirements) RCEP Arts. 10.3 (national treatment), 10.6 (performance requirements)

(continued)

Table 7: continued

Policy Type	WTO Rule (citation)	FTA rule (example)
Government Procurement: Indian new local procurement rules for medical device producers selling the government US advanced purchase of vaccines EU advanced purchase agreements with localization requirements (AstraZeneca & Curevac)	GPA Art. IV: Requires non-discrimination and transparency in government purchasing and contracting decisions	EU-Ukraine Art. 151 (non-discrimination and transparency) USMCA Art. 13.4 (non-discrimination and transparency) CPTPP Art. 15.4 (non-discrimination, and transparency) RCEP Art. 16.4 (transparency only)
IP/Compulsory Licensing: Modification of domestic CL rules (Germany, France) USMCA Art. 20.6 (affirming commitment to Doha Declaration) CPTPP Art. 18.41 (incorporates TRIPS by reference) RCEP Art. 11.39 (incorporates TRIPS Art. 31, 31bis by reference)	TRIPS Agreement, Article 31, 31bis	EU-Ukraine Art. 219 (reaffirming the Doha Declaration on TRIPS and Public Health)

Source: Authors' analysis.



CHAPTER 4

TENSIONS AND TRADE-OFFS IN PANDEMIC POLICYMAKING

The evidence above makes clear that during the COVID-19 pandemic the countries in our study frequently ignored or chose to disregard constraints on their policies that could arise from commitments at the WTO or under other trade or investment agreements. As they discovered their need for PPE and the rapid development of diagnostic tools, treatments and vaccines for COVID-19 for their populations, many governments took the lead in attempting to secure these life-saving products. Their success depended to a significant degree on the resources available to them, with high-income countries deploying extensive financial resources and subsidies in addition to tariffs, trade constraints and in-kind measures, while middle- and especially low-income countries with significant resource constraints were forced to rely more on non-financial measures. In our sample, China, India and South Africa predominantly used tariffs and trade constraints.

In each case, government policy interventions reflected tensions and trade-offs involving difficult decisions made while legally, politically and/or fiscally constrained. We identify three important dimensions of the trade-offs involved.

First is the tension between national and global level responses to the pandemic. By its nature, the COVID-19 pandemic crossed borders repeatedly, fueling wave after wave of infections, illness and death around the globe. From a purely scientific perspective, the most effective and only fully successful approach to end the pandemic is at the global level. From an ethical perspective, all humans should have access to prevention and treatment during a global pandemic. However, governance occurs at the level of the state, with national and in some places, sub-national governments, the only entities with both the legal authority and practical ability to respond.[13] These governments have the responsibility to protect their citizens and residents; and political leaders perceived that their own standing and even tenure would be determined by their success in doing so. By contrast, there is no global "government", and existing institutions at the supranational level, such as the World Health Organization (WHO), lack both the authority to mandate responses by states and the means to deliver sufficient public goods. For example, the WHO and regional groups designed to address health issues including pandemics have no real enforcement power and extremely limited resources compared to the scale of the challenge.

With the main action to address the pandemic thus occurring at national and sub-national levels, high-income countries were able to use their superior financial resources to command a disproportionate

[13] In the European Union, some relevant competencies exist at the supra-national EU level.

share of health resources to protect their own populations. Middle-income countries with existing capabilities to produce PPE, treatments and vaccines, such as China and India, faced the difficult trade-off of reserving these assets for their own country, or exporting them to others in need (Findlay, Peel and Mancini 2021). Low-income countries faced tight limits on both finance and production capacity and could rely only, or primarily on public health measures that they had the capacity to implement. The tension between national and global responses therefore has had the additional effect of exacerbating health inequality around the world.

The second dimension along which policymakers face trade-offs is between private and public interests. Private sector actors' interests include the usual goals of increasing returns to shareholders, maintaining or increasing market share and maximizing profits. The overwhelming public interest is in limiting the spread of the pandemic and increasing availability of diagnostic tools, treatments and vaccines to prevent severe disease and death. At each stage of the pandemic, limited availability of supplies has meant scarcity relative to demand, first of PPE and testing supplies, later of treatments and vaccines. As national level governments sought to acquire needed products, private sector, profit-driven providers typically sold them to the highest bidder, increasing overall costs and favoring well-resourced governments over lower-income countries. Even among high-income countries, governments that offered higher purchase prices or advance purchase agreements were prioritized for delivery by the private suppliers.

Governments also provided support for research and development of treatments and vaccines and here again there is tension between the public interest of rapid, widespread access to the resulting products and the private sector's interest in maximizing profits. For example, the US government provided substantial existing public research and additional research funds to Moderna, Inc. for development of an mRNA vaccine.[14] However, Moderna reportedly has taken steps to claim full ownership of the resulting intellectual property and has refused to license additional production in other countries (Stolberg and Robbins 2021, Rizvi 2021). Moderna reported $2.8 billion in profits in the second quarter of 2021 and its stock increased over 300 percent from January through July 2021 (Kilgore 2021), while the advanced mRNA vaccines it produces are largely unavailable outside high-income countries.

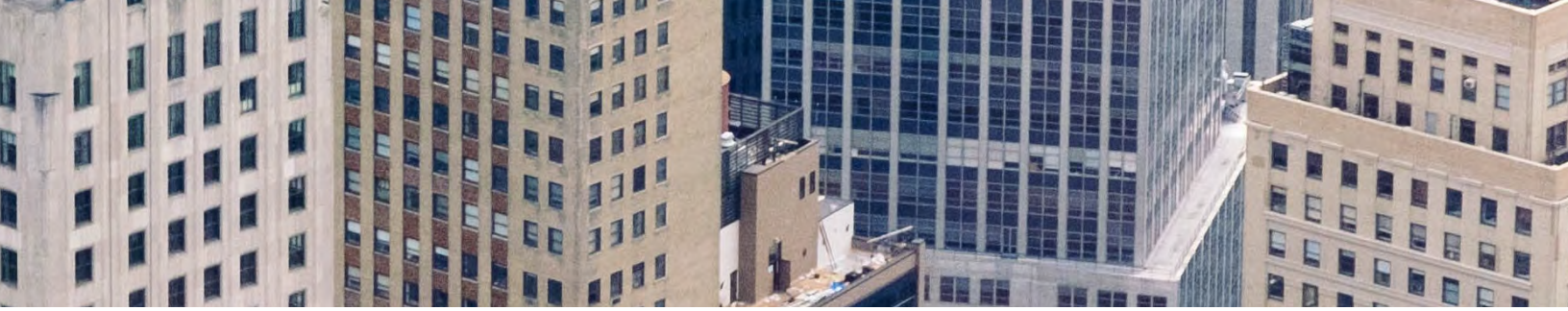
A third and related set of trade-offs relates to efficiency versus equity. It is argued by some economists that the incentives facing the private sector lead to efficiency gains that ultimately allow for greater overall supply and therefore the possibility for greater overall distribution (Evenett 2020; Bown and Bollyky 2021). With respect to health and medical products in general and responses to the COVID-19 pandemic in particular, this argument is debatable. Studies over the last 30 years have shown that, overall, the private sector under-invests in research and development to address illnesses that plague low-income countries and people because the short-term return on investment is not high (Commission on Health Research for Development 1990; WHO 2012). A second point of debate concerns the purported beneficial role of intellectual property protections in incentivizing research on new treatments and vaccines. Here the argument is that excessively long protection for intellectual property actually discourages new research and innovation, as pharmaceutical companies and other

[14] US Department of Health and Human Services reported that "BARDA, JPEO-CBRND and Army Contracting Command also collaborated to provide up to approximately $1.65 billion to Moderna, bringing the total federal investment in Moderna's vaccine development, clinical trials, manufacturing and purchase to approximately $5.75 billion. Moderna's vaccine was co-developed with scientists from the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, with NIAID also supporting the vaccine's nonclinical studies and clinical trials. BARDA supported phase 2/3 clinical trials, vaccine manufacturing scale up and other development activities for this vaccine" (HHS 2021, Herman 2020).

producers are able to continue to collect rents (defined as excess profits that can be realized in the absence of competition) from earlier research for as long as the patent protection lasts and generic producers are prevented from competing with them. A further critique is more specific to the current pandemic, when for-profit corporations have withheld intellectual property such as patents, trade secrets and production methods from vaccine-producing firms in other countries, arguably in order to maintain scarcity of supply and therefore, high prices.[15] Each of these criticisms raises questions as to whether the "invisible hand" of the private sector actually results in greater efficiency and the increase in overall production of goods that is claimed by market advocates. With regard to equity, the scarcity of supply, including what many consider manipulated scarcity, greatly undercuts the scope for fairer distribution.

Government interventions to address the economic effects of the pandemic also involve tradeoffs, including trade-offs between international obligations under trade and investment agreements and domestic needs, as seen in Table 6 and discussed above. The complexity of the issues and the tradeoffs involved complicate the question of whether and how to reform the trade regime to achieve better international outcomes, more equity and greater resilience in the face of inevitable future pandemics or other public health crises. However, some basic principles can guide such efforts, as discussed in the following section.

[15] Amnesty International argues that "Despite receiving billions of dollars in government funding and advance orders which effectively removed risks normally associated with the development of medicines, vaccine developers have monopolized intellectual property, blocked technology transfers, and lobbied aggressively against measures that would expand the global manufacturing of these vaccines" (Amnesty International 2021).



CHAPTER 5

RECOMMENDATIONS AND CONCLUSIONS

Based on our work, we identify three key arenas where tensions, trade-offs or failures to achieve acceptable results in response to the pandemic demonstrate the need for a reform of the trade rules. Our recommendations address the following priorities: reforms to improve the handling of the current pandemic; reforms aimed at building resilience for the next pandemic and public health more broadly; and reforms to trade and investment rules to enable greater future economic resilience and global equity. These recommendations would require changes at both the global institutional level and within the domestic policies of individual countries, and they require action in the near-term, as well as the long-term.

SHORT-TERM POLICY REFORM FOR THE COVID-19 PANDEMIC

WTO members should immediately agree to a broad waiver of the TRIPS Agreement for products related to testing, treatment, PPE and vaccines, in order to remove intellectual property obstacles to equitable and widespread access to those products. Countries would then be able to implement CLs and other measures without risking a dispute at the WTO (Gurgula 2021). In the present crisis, governments must have effective policy space to allow medicines, diagnostics, vaccines and medical devices to be made quickly, at scale and at affordable price. This is the first step countries can take collectively to begin to expand global supply of these essential products.

A TRIPS waiver alone will not suffice, however. In the context of the newest treatment and vaccine technologies, new manufacturers will need both the technology and know-how to begin to produce. The historical mechanism for technology transfer is through industry-led voluntary licensing in which companies out-license their patents and sometimes their non-patentable know-how to be used by selected generic manufacturers. Although this has taken place in limited instances during the pandemic, the scale has not been sufficient and the distribution extremely inadequate, as demonstrated by the low rates of vaccination in much of the developing world (Gurgula 2021).

While India has managed to secure voluntary licenses (VLs) from AstraZeneca, Johnson & Johnson and for the Russian Sputnik vaccine, Moderna and Pfizer/BioNTech have both refused to grant manufacturing licenses for their mRNA vaccines in India, South America or Africa (Maxmen 2021). South Africa has managed to acquire only a "fill and finish" contract (i.e., filling vials and packaging them), while the actual bulk of the manufacturing takes place elsewhere (Ghosh 2021, Erman, Roelf and Winning 2021). In general, Moderna and Pfizer have argued that VLs would be inefficient and ineffective

in the developing world. Moreover, even where VLs have been secured including through the Medicines Patent Pool (a non-governmental organization set up to broker such licenses), contract-based constraints have left many lower- and middle-income countries without access (Shashikant 2021). The COVID-19 Technology Access Pool (C-TAP) is a WHO-sponsored initiative seeking to provide a "one-stop shop for developers" of COVID-19 products "to share their intellectual property, knowledge, data and more through voluntary, non-exclusive and transparent licenses", but in practice too, this effort has been underfunded and undermined, with few if any of the major vaccine producers willing to meaningfully share their intellectual property (WHO 2020).

Simple appeals to patent holders to facilitate technology transfer have not yielded sufficient results, and it should not be left to wealthy philanthropists to fill in the gaps the private sector has left. Instead, high-income countries should begin to leverage their knowledge and financial resources and high levels of demand to require originators to "share data, knowledge and technology on a non-exclusive basis" (Shashikant 2021). For example, many stakeholders have recommended additional reliance in the US on the Defense Production Act or on the specific terms of the government support contracts for research and development to put pressure on Moderna and others to share the needed technology and know-how (Gallogly-Swan & Thrasher 2021).

In addition to pressure by wealthy countries, middle-income countries should encourage the domestic development and reverse engineering of vaccines. Such an effort has already been initiated by the WHO and engineers at Afrigen in South Africa, who are actively attempting to reverse engineer Moderna's vaccine (Nolen 2021). WTO members could play a constructive role by agreeing to the TRIPS waiver (or at a minimum, a peace clause) to prevent potential costly and time-consuming conflicts over pandemic-related policymaking (Kanth 2021).

BUILDING LONG-TERM HEALTH RESILIENCE

Expanding and diversifying global supply can help deal with this pandemic, but the larger gain will be for future pandemics if countries around the world collaborate to build national or regional production hubs that increase availability and help to ensure equitable distribution of tests, treatment and vaccines. The job of expanding and diversifying supply chains is not a short-term goal or project. Building long-term resilience in the global pharmaceutical and health sector will require coordinated reform at global, regional and national levels.

At the national level, countries should not shy away from taking an active role in building up their own health sector resilience. For example, in 2020, the US Patent and Trademark Office created a COVID-19 Prioritized Examination Pilot Program for up to 500 qualifying patent applications that addressed the COVID-19 outbreak, which waived certain fees for qualified applicants. Others have suggested creating a 'humanitarian' patent to be granted on a product that was produced for, and in response to, a public health emergency. Such a 'humanitarian' patent could only be licensed non-exclusively. As an incentive, a voucher would be given to the patent applicant for priority patent review on another patent application.

A unique example of domestic resilience can be found in Bangladesh, which deployed a wide array of subsidies, investment measures and health policies over 40 years to build up a domestic pharmaceutical industry from scratch (Mustafizur et al. 2021). While it originally closed itself off to pharmaceutical investment and imported products as much as possible, Bangladesh has, more recently, been able to strategically open up due to the competitiveness of its industry. This industrial policy

was exempt from WTO constraints because Bangladesh is categorized as a least developed country (LDC) and as such is exempt from certain intellectual property commitments at the WTO. South Africa, by contrast, has seen its global market share in pharmaceuticals slowly erode (Horner 2021). As multinational corporations have set up shop in other places, South Africa has shifted from being a manufacturer, to an importer. The reality for South Africa will quickly become the reality for Bangladesh when it graduates from LDC status in 2026. Unfortunately, it represents the current reality for the majority of low- and middle-income countries, where trade rules do not allow strategic health and industrial policymaking. As such, individual countries that decide to build their pharmaceutical industries must start by carefully skirting the rules, while advocating for change at the WTO simultaneously, as discussed further below.

At the regional level, countries should collaborate to create structures for regional production hubs with strong accountability mechanisms. Recently, efforts to organize manufacturing by region have not shown consistent success (Buckholtz 2021, Keenan 2021). India, for example, despite its potential role in supplying vaccines for its neighbors, has found its own production stymied by supply chain bottlenecks and the political requirement to vaccinate its own citizens before exporting those vaccines (Government of India Press Information Bureau 2021) – a clear example of the complex trade-off between national and global needs. To mitigate the risks of devolving into nationalism in a crisis, these regional hubs will require new accountability mechanisms both internally and externally, which is a challenging task.

At a global institutional level, the rules must make space for these efforts. Presently, for the vast majority of countries, any measure that preferences domestic products, services or investment vis-a-vis imports or foreign investors is strongly discouraged, or in some cases prohibited under the current global trade rules (GATT Art. III, TRIMs Art. 2, Annex). Any measure that seeks to widen the current distribution of production and supply chains could be claimed to "nullify or impair" the benefits that firms expected when their countries signed trade agreements (GATT Art. XXIII). As detailed above, our study found that many large and powerful countries were willing to enact policies that run up against global trade rules in order to deal with the crisis, but their measures may be challenged in the future. Less powerful and smaller economies are even more vulnerable. The global trade regime needs to be re-thought and reformed with regard to health policies and industrial policies more generally to allow countries to better address global crises, such as pandemics.

ENABLING FUTURE ECONOMIC RESILIENCE AND EQUITY, WITHIN AND ACROSS COUNTRIES

The domestic policy interventions chosen by many governments to respond to the severe economic disruption caused by the pandemic also point to non-health areas where there is a need for policy change. Domestic measures aimed at stabilizing economies, preserving jobs and securing supply chains were in tension with a range of trade and investment rules that place constraints on government policy space to intervene in the economy. Supply chain disruptions in both health and non-health products highlighted the lack of resilience that has resulted from extensive offshoring, fragmentation of supply chains and reduced competition. The existing supply chains combine production that is highly fragmented, while at the same time concentrating production of specific essential components in a few or even single countries. Even countries where some aspects of production were concentrated faced lack of inputs and breakdowns in logistics, causing cascading blockages and supply disruptions

across the globe. These problems existed before the pandemic, but exacerbated the health and economic crises.

The experience of the crisis shines light on the role governments have to play to ensure their economies can deliver essential goods and services, protect livelihoods and withstand disruptions and crises. Policies to build up capacity in important sectors are now widely seen as essential to both resilience and future economic security. This approach, traditionally called industrial policy, was used in many countries during the post-war decades but went out of fashion with the shift to market-oriented economics in the 1980s that prevailed until the pandemic. Current trade and investment rules were negotiated during that period and reflect the then-dominant economic philosophy of market primacy and small government. The rules restrict many component measures of industrial policy, such as subsidies, domestic purchase requirements to build up backward and forward linkages and create jobs and other forms of state aid. However, given the widespread recourse to such measures during the pandemic (as seen in Table 6), and announced plans by many countries to build up particular sectors in the future, it is clear that the time has come to revisit these rules.

An updated approach that allows governments greater policy space in both health and non-health sectors should be pursued. As a minimum starting point, the exceptions permitted to the existing suite of trade rules should be broadened in a purposeful and systematic manner. For example, Article XX of the WTO currently includes a list of policy areas where exceptions are permitted, as discussed above. The list covers some essential public welfare measures but not others, with a fragmented and inconsistent result.[16] For example, exceptions are permitted "to protect public morals" and human, animal or plant life or health. The list should be expanded to provide explicit exceptions for measures undertaken to pursue full employment, economic security, social equity and development, for example. These additional public welfare goals are currently not among the permitted exceptions, although they are fundamental to human and societal well-being. Developing countries have long lamented the restrictions on policy space as impeding their ability to use coherent measures to achieve development and raise living standards. The fact that even developed countries felt the need to flout the constraints during the pandemic should provide common ground for serious reform.

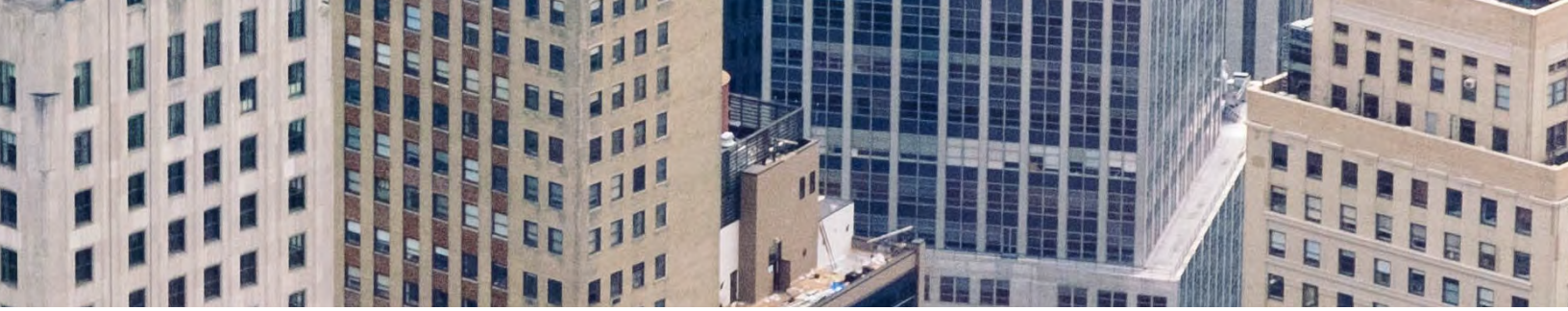
A second area in need of fundamental reform to restore balance between public and private interests in the global trade and investment regime relates to the ISDS mechanism found in many FTAs and BITs, described above. The mechanism is an extreme example of the pro-market, anti-regulatory philosophy of the last several decades and was incorporated into international law through those agreements and treaties. As noted above, private law firms are reported to be exploring or soliciting suits against governments for health and other actions taken during the pandemic (Ranald 2020, Eberhardt 2020). Even before the pandemic, a number of governments had recognized the extreme imbalance between private and public interests underlying the ISDS approach and had started to revise investment treaties, or limit access to such mechanisms under newer trade agreements (Uribe and Danish 2021, Garcia-Barragan et al. 2019, European Commission 2021b, Harrison, Francis and Stanic 2021, Thanvi 2020, Bhutta 2021). These reforms should continue with greater urgency.

The pandemic experience makes clear that the existing balance in trade and investment regimes between government policy space and the prerogatives of the private sector has been tilted too far toward the latter. Going forward, the constraints on government policy space should be scaled back to improve the resilience, equity and sustainability of individual economies, public health and the global

[16] Some insight can be gleaned into the historical moments and concerns that shaped the list and its application from the following sources: WTO Article XX General Exceptions, Padideh 1999.

system as a whole. An extensive debate and body of research and policy advice advocating such a rebalancing of trade and investment rules was underway before the pandemic and can illuminate the many specific areas where obligations should be rethought and revised (Thrasher 2017, Polaski et al. 2020, Davies et al. 2021).

The ability of governments to act in the public interest to improve living standards and public health, as well as to seek greater distributional equity and ecological sustainability should be explicitly acknowledged in all trade and investment agreements to take precedence over rules favoring private commercial interests. This prioritization of human welfare is often stated in the non-binding, hortatory introductory paragraphs of these agreements. But in practice, governments use the binding aspects of the agreements to pursue inter-state disputes that favor the commercial success and private profits of their own firms, regardless of negative welfare impacts in other countries; and arbitral panels typically apply the agreements' rules strictly, without concern for broader public interests. Trade and investment agreements should instead state that government actions to protect human well-being, achieve greater social equity and protect the planet are higher order priorities that are exempt from challenges under trade and investment agreements.



REFERENCES

Ala'I, P. (1999) Free Trade or Sustainable Development? An Analysis of the WTO Appellate Body's Shift to a More Balanced Approach to Trade Liberalization *American University International Law Review* 14(4): 1129-1171.

Amnesty International (Sept 2021) "A Double Dose of Inequality: Pharma companies and the COVID-19 vaccine crisis". Available at: https://www.amnestyusa.org/wp-content/uploads/2021/09/A-Double-Dose-of-Inequality.pdf (visited 19 Nov 2021).

Baker, B. (6 June 2021) "The Impracticality of Relying Compulsory Licenses to Expand Production Capacity for COVID-19 Vaccines" Health GAP. Available at https://healthgap.org/the-impracticality-of-relying-on-compulsory-licenses-to-expand-production-capacity-for-covid-19-vaccines/ (visited 3 Nov 2021).

Bhutta, Z. (5 Aug 2021) "Pakistan to terminate 23 bilateral investment treaties - Decision aimed at avoiding international arbitration with foreign firms" *The Express Tribune*. Available at: https://tribune.com.pk/story/2313937/pakistan-to-terminate-23-bilateral-investment-treaties (visited 4 Nov 2021).

Borah, R. (2020) Every Minute Matters: Improving the Regulatory Response to Vaccine Development During a Public Health Emergency *Food and Drug Law Journal* 75(2): 311-345.

Bown, C. P., & Bollyky, T. J. (2021). How COVID-19 vaccine supply chains emerged in the midst of a pandemic. *Peterson Institute for International Economics Working Paper*, (21-12).

Buckholtz, A. (2021) "Inside Africa's Push to Make its Own Medicines: Regional pharma manufacturing hubs can expand the availability of drugs lower costs and strengthen local health systems" International Finance Corporation, World Bank Group. Available at https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/cm-stories/africa-pharma-manufacturing-hubs-en (visited 7 Nov 2021).

Coelho, B. and Gallagher, K.P. (2013) The effectiveness of capital controls: evidence from Colombia and Thailand *International Review of Applied Economics* 27(3): 386-403 (2013).

Commission on Health Research for Development (1990) "Health Research: Essential Link to Equity in Development" New York: Oxford University Press. Available at: http://www.cohred.org/downloads/open_archive/ComReports_0.pdf (visited 3 Nov 2021)

Canada-Australia-Brunei-Chile-Japan-Malaysia-Mexico-New Zealand-Peru-Singapore-Viet Nam. 2018. "Comprehensive and Progressive Agreement for Trans-Pacific Partnership." Government of Canada. https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/tpp-ptp/text-texte/toc-tdm.aspx?lang=eng (visited 7 Nov 2021).

Consultative Expert Working Group on Research and Development, Financing and Coordination (2017) "Research and Development to Meet Health Needs in Developing Countries: Strengthening Global Financing and Coordination" *World Health Organization*. Available at: https://www.who.int/phi/CEWG_Report_5_April_2012.pdf (visited 3 Nov 2021).

CRS Report (2019) "Effects of Buy America on Transportation Infrastructure and U.S. Manufacturing" CRS Report No. 44266 (2019). Available at https://www.everycrsreport.com/reports/R44266.html (visited 3 Nov 2021).

Davies, R., Banga, R., Kozul-Wright, R. Gallogly-Swan, K., Capaldo, J. (2021) "Reforming the International Trading System for Recovery, Resilience, and Inclusive Development" *UNCTAD Research Paper* No. 65. Available at: https://unctad.org/system/files/official-document/ser-rp-2021d8_en.pdf (visited 4 Nov 2021).

Eberhardt, P. (2020) "Cashing in on the Pandemic - How lawyers are preparing to sue states over COVID-19 response measures" *Corporate Europe Observatory and Transnational Institute*. Available at: https://longreads.tni.org/cashing-in-on-the-pandemic (visited 4 Nov 2021).

Erman, M., Roelf, W., Winning, A. (21 July 2021) "South African firm to help make Pfizer/BioNTech COVID Vaccine" *Reuters*. Available at https://www.reuters.com/business/healthcare-pharmaceuticals/pfizerbiontech-strike-south-africa-covid-19-manufacturing-deal-with-biovac-2021-07-21 (visited 22 Aug 2021).

European Commission (30 Sept 2021) "Commission Statement on consulting Member States on proposal on the future of the State Aid Temporary Framework" Press Release. Available at https://ec.europa.eu/commission/presscorner/detail/en/ip_21_4948 (visited 1 Nov 2021).

European Commission (July 2021) "The Multilateral Investment Court project". Available at: https://trade.ec.europa.eu/doclib/press/index.cfm?id=1608 (visited 4 Nov 2021).

Evenett, S.J. (2019) Protectionism, state discrimination, and international business since the onset of the Global Financial Crisis *Journal of International Business Policy* 2: 9–36.

Evenett, S. J. (2020). Sicken thy neighbour: The initial trade policy response to COVID-19. *The World Economy*, *43*(4), 828-839

Federal Register (20 Sept 2010) "Request for Comments on Incentivizing Humanitarian Technologies and Licensing Through the Intellectual Property System" Notice by the Patent and Trademark Office. Available at https://www.federalregister.gov/documents/2010/09/20/2010-23395/request-for-comments-on-incentivizing-humanitarian-technologies-and-licensing-through-the (visited 3 Nov 2021).

Findlay, S., Peel, M., Mancini, D. P. (25 March 2021) "India blocks vaccine exports in blow to dozens of nations" *Financial Times*. Available at: https://www.ft.com/content/5349389c-8313-41e0-9a67-58274e24a019 (visited 1 Nov 2021).

Garcia-Barragan, D., Mitretodis, A., Tuck, A. (2019) The New NAFTA: Scaled-Back Arbitration in the USMCA *Journal of International Arbitration*, 36(6): 739-754.

Gaviria, M. and Kilic, B. (2021) A network of mRNA COVID-19 vaccine patents *Nature Biotechnology* 39: 546-548.

Ghosh, P. (18 Sept 2020) "COVID-19 Vaccine: These seven firms in India have license for vaccine manufacture" *Hindustan Times*. Available at https://www.hindustantimes.com/india-news/covid-19-vaccine-these-seven-firms-in-india-have-license-for-vaccine-manufacture/story-C0hOec2Bjlht-VFiFzCwdWK.html (visited 23 Aug 2021).

Goldman, A. and Balasubramaniam, T. (17 Aug 2015) "Switzerland pressures Colombia to deny compulsory license on imatinib" *Knowledge Ecology International*. Available at https://www.keionline.org/22864 (visited 3 Nov 2021).

Gourdon, J. and Messent, J. (2017) "How government procurement measures can affect trade" OECD Trade Policy Papers, No. 199. Available at http://dx.doi.org/10.1787/d1ab07b8-en (visited 3 Nov 2021).

Gurgula, O. (2021) "Compulsory licensing vs. the IP waiver: what is the best way to end the COVI D-19 pandemic" South Centre Policy Brief No. 104. Available at https://www.southcentre.int/wp-content/uploads/2021/10/PB104_Compulsory-licensing-vs.-the-IP-waiver_EN-2.pdf (visited 1 Nov 2021).

Harrison, M., Francis, C., Stanic, L. (June 2021) "Shifting tides in Canada's approach to investor-state dispute settlement" *Financier Worldwide Magazine*. Available at: https://www.financierworldwide.com/shifting-tides-in-canadas-approach-to-investor-state-dispute-settlement#.YXAeedZByZw (visited 4 Nov 2021).

Herman, B. (Aug 2020) "Moderna skirts disclosures of coronavirus vaccine costs" *Axios*. Available at: https://www.axios.com/moderna-barda-coronavirus-funding-disclosure-2775a517-a775-485a-a509-b6906c8535a9.html (visited 19 Nov 2021).

"Highlights of the 17-year Airbus, Boeing trade war" *Reuters World* (15 June 2021). Available at https://www.reuters.com/world/highlights-17-year-airbus-boeing-trade-war-2021-06-15/ (visited 3 Nov 2021).

Horner, R. (2021) Global value chains, import orientation, and the state: South Africa's pharmaceutical industry *Journal of International Business Policy*. Available at https://doi.org/10.1057/s42214-021-00103-y (visited 1 Nov 2021).

International Monetary Fund (IMF) (2020) "Toward An Integrated Policy Framework" IMF Policy Paper. Available at https://www.imf.org/en/Publications/Policy-Papers/Issues/2020/10/08/Toward-an-Integrated-Policy-Framework-49813 (visited 14 October 2021).

Jeanne, O., Subramanian, A., and Williamson, J. *Who Needs to Open the Capital Account?* (Peterson Institute for International Economics, 2011).

Kanth, D.R. (21 Oct 2021) "US proposes 'peace clause' for disputes concerning IPRs at WTO" *TWN Info Services on Intellectual Property Issues*. Available at https://twn.my/title2/intellectual_property/info.service/2021/ip211012.htm (visited 3 Nov 2021).

Keenan, J. (23 Sept 2021) "Vaccine players in Argentina, Brazil selected as regional producers for COVID-19 shots" *Fierce Pharma*. Available at https://www.fiercepharma.com/manufacturing/health-group-picks-sites-argentina-and-brazil-as-regional-hubs-producing-covid-19 (visited 7 Nov 2021).

Kilgore, T. (5 Aug 2021) "Moderna swings to big Q2 profit beat, as 199 million doses of COVID-19 vaccine were sold" *Market Watch*. Available at: https://www.marketwatch.com/story/moderna-swings-to-big-q2-profit-beat-as-199-million-doses-of-covid-19-vaccine-were-sold-2021-08-05 (visited 3 Nov 2021).

Labonté, R., Johri, M., Plamondon, K. *et al.* (2021) Canada, global vaccine supply, and the TRIPS waiver *Canada Journal of Public Health* 112: 543–547 (2021). Available at https://doi.org/10.17269/s41997-021-00541-4 (visited 3 Nov 2021).

Maxmen, A. (16 Sept 2021) "The fight to manufacture COVID vaccines in lower-income countries 2021" *Nature*, News Article. Available at https://www.nature.com/articles/d41586-021-02383-z (visited 3 Nov 2021).

Medecins Sans Frontieres (MSF) Timeline of US Pressure on India. Available at https://msfaccess.org/sites/default/files/2018-10/IP_Timeline_US%20pressure%20on%20India_Sep%202014_0.pdf (visited 3 Nov 2021).

New, W. (2019) "Malaysia Still Under Pressure to Make Hepatitus C Medicine More Expensive" *Intellectual Property Watch*. Available at https://www.ip-watch.org/2019/02/13/malaysia-still-pressure-make-hepatitis-c-medicine-expensive/ (visited 3 Nov 2021).

Nolen, S. (22 Oct 2021) "Here's Why Developing Countries can make mRNA COVID vaccines" *New York Times*. Available at https://www.nytimes.com/interactive/2021/10/22/science/developing-country-covid-vaccines.html (visited 2 Nov 2021).

Nolen S. and Stolberg, S.G. (22 Sept 2021) "Pressure Grows on U.S. Companies to Share Covid Vaccine Technology" *New York Times*. Available at: https://www.nytimes.com/2021/09/22/us/politics/covid-vaccine-moderna-global.html (visited 2 Nov 2021).

Ostry, J.D., Ghosh, A.R., Habermeier, K., Chamon, M., Qureshi, M.S., Dennis B.S. Reinhardt, D.B.S. (2010) "Capital Inflows: The Role of Controls" 04 IMF Staff Position Note SPN/10/04. Available at http://elibrary.imf.org/view/IMF004/10708-9781462347513/10708-9781462347513/10708-9781462347513.xml (visited 14 October 2021).

Perehudoff, K., 't Hoen, E., Boulet, P. (2021) Overriding drug and medical technology patents for pandemic recovery: a legitimate move for high-income countries, too *BMJ Global Health* Commentary, 6(4): 1-4. Available at doi:10.1136/bmjgh-2021-005518 (visited 1 Nov 2021).

Polaski, S., Anderson, S., Cavanagh, J., Gallagher, K.P., Pérez-Rocha, M., Ray, R. (2020) *How Trade Policy Failed US Workers—and How to Fix It*, Boston University Global Development Policy Center, Institute for Policy Studies and Groundwork Collaborative. Available at: https://www.bu.edu/gdp/files/2020/09/How-Trade-Policy-Failed-US-Workers-and-How-to-Fix-it-FIN.pdf (visited 4 Nov 2021).

Rahman, M. Wirtz, V.J., Kaplan, W.A., Thrasher, R.D., Gallagher, K.P. (Sept 2021) Policy Space for Building Production Capabilities in the Pharmaceutical Sector in Low- and Middle-Income Countries: Evidence from Bangladesh *GDP Center, GEGI Working Paper 051*. Available at https://www.bu.edu/gdp/files/2021/09/GEGI_WP_051_FIN.pdf (visited 3 Nov 2021).

Ranald, P. (23 April 2020) "Corporations prepare to sue over action to save lives as pandemic reveals trade flaws" *The Conversation*. Available at: https://theconversation.com/corporations-prepare-to-sue-over- action-to-save-lives-as-pandemic-reveals-trade-flaws-136604 (visited 4 Nov 2021).

Reinsch, W.A., Hoffner, J., Caporal, J. (10 April 2020) "A World in Crisis: Will Buying American Help or Hurt?" Center for Strategic & International Studies, Critical Questions. Available at https://www.csis.org/analysis/world-crisis-will-buying-american-help-or-hurt (visited 3 Nov 2021).

Rizvi, Z. (10 Aug 2021) "Sharing the NIH-Moderna Vaccine Recipe" Public Citizen. Available at: https://www.citizen.org/article/sharing-the-nih-moderna-vaccine-recipe/ (visited 8 Nov 2021).

Sashikant, S. (19 Oct 2021) "Intellectual Property Monopolies Perpetuate Inequitable Access to COVID-19 Therapeutics" *Third World Network*. Available at https://www.twn.my/title2/intellectual_property/info.service/2021/ip211011.htm (visited 3 Nov 2021).

Schultz, T. and Dupont, C. (2014) Investment Arbitration: Promoting the Rule of Law or Over-Empowering Investors? A Quantitative Empirical Study *European Journal of International Law*, 25(4): 1147-68.

South Centre (March 2021) "Scope of Compulsory License and Government Use of Patented Medicines in the Context of the COVID-19 Pandemic" South Centre Health, Health, Intellectual Property, and Biodiversity Programme. Available at https://www.southcentre.int/wp-content/uploads/2021/03/Compulsory-licenses-table-Covid-19-2-March.pdf (visited 1 Nov 2021).

Stolberg, S.G. and Robbins, R. (9 Nov 2021) "Moderna and US at Odds Over Vaccine Patent Rights" *The New York Times*. Available at https://www.nytimes.com/2021/11/09/us/moderna-vaccine-patent.html (visited 12 Nov 2021).

Suneja, K. (27 June 2019) "India wins solar case against the US in WTO" *The Economic Times Industry*. Available at https://economictimes.indiatimes.com/industry/energy/power/wto-panel-rules-in-indias-favour-in-renewable-energy-case-against-us/articleshow/69978672.cms?from=mdr (visited 3 Nov 2021).

Sweet, A.S., Chung, M.Y., Saltzman, A. (2017) Arbitral Lawmaking and State Power: An Empirical Analysis of Investor–State Arbitration *Journal of International Dispute Settlement* 8(4): 579-609.

Thanvi, A. (23 Oct 2020) "Bit by bit to a big leap: India and the ISDS reforms" *The Daily Guardian*. Available at: https://thedailyguardian.com/bit-by-bit-to-a-big-leap-india-and-the-isds-reforms/ (visited 4 Nov 2021).

ThePharmaLetter (27 April 2021) "Gilead Sciences challenges compulsory licensing of its anti-COVID-19 drug in Russia". Available at https://www.thepharmaletter.com/article/gilead-sciences-to-challenge-compulsory-licensing-of-its-anti-covid-19-drug-in-russia (visited 8 Nov 2021)

Thrasher, R.D. and Gallagher, K.P. (2010) 21st Century Trade Agreement: Implications for Development Sovereignty *Denver Journal of International Law and Policy* 38(2): 313 (2010).

Thrasher, R.D. (2021) *Constraining Development: The Shrinking of Policy Space in the International Trade Regime*, Anthem Press.

Thrasher, R.D., Sklar, S., Gallagher, K.P. (2019) "Quantifying Policy Space for Regulating Capital Flows in Trade and Investment Treaties" G-24 Working Paper. Available at https://www.g24.org/wp-content/uploads/2019/03/Gallagher_Capital_Flows_and_Treaties.pdf (visited 3 Nov 2021).

Thrasher, R.D. (2018) "Policy Space for Jobs and Clean Energy: Trade, Investment Rules and Local Content Requirements in Renewable Energy Policies" in *Yearbook on International Investment Law and Policy*, L.E. Sachs, L. Johnson, and J. Coleman (Eds.). Oxford University Press.

United Nations Conference on Trade and Development (UNCTAD) (11 Feb 2021) "UNCTAD releases data on over 1,000 investor-state arbitration cases" Available at: https://unctad.org/news/unctad-releases-data-over-1000-investor-state-arbitration-cases (visited 1 Nov 2021).

Uribe D., Danish (June 2020) "Investment Policy Options for Facing COVID-19 Related ISDS Claims" *South Centre Investment Policy Brief* No. 22. Available at: https://www.southcentre.int/investment-policy-brief-22-june-2021/ (visited 4 Nov 2021).

US Department of Health and Human Services (HHS) (11 Feb 2021) "Biden Administration purchases additional doses of COVID-19 vaccines from Pfizer and Moderna". Available at: https://www.hhs.gov/about/news/2021/02/11/biden-administration-purchases-additional-doses-covid-19-vaccines-from-pfizer-and-moderna.html (visited 3 Nov 2021).

US Patent and Trademark Office (n.d.) "COVID-19 Prioritized Examination Pilot Program". Available at https://www.uspto.gov/initiatives/covid-19-prioritized-examination-pilot (visited 8 Nov 2021).

Wellhausen, R.L. (2016) Recent Trends in Investor–State Dispute Settlement *Journal of International Dispute Settlement*, 7(1): 117-35.

Wolfe, R., and Mavroidis, P. C. (2020). WTO dispute settlement and the appellate body: insider perceptions and members' revealed preferences. *Journal of World Trade*, 54(5).

Working Group on Trade, Investment Treaties and Access to Medicines (Oct 2019) "Rethinking Trade Treaties & Access to Medicines: Toward a Policy Oriented Research Agenda" Global Development Policy (GDP) Center Report. Available at https://www.bu.edu/gdp/2019/11/06/rethinking-trade-treaties-access-to-medicines-toward-a-policy-oriented-research-agenda/ (visited 3 Nov 2021).

World Health Organization (WHO) (2020) Solidarity Call to Action. Available at https://www.who.int/initiatives/covid-19-technology-access-pool/solidarity-call-to-action (visited 24 Aug 2021).

World Intellectual Property Organization (WIPO) (2021) COVID-19 Policy Tracker. Available at https://www.wipo.int/covid19-policy-tracker/#/covid19-policy-tracker/access (1 Nov 2021).

International Law Resources

General Agreement on Tariffs and Trade (GATT), Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194.

Agreement on Trade-Related Investment Measures (TRIMs), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1868 U.N.T.S. 186

Agreement on Subsidies and Countervailing Measures (SCM), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1869 U.N.T.S. 14

Agreement on Government Procurement (GPA), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 4(b), 1915 U.N.T.S. 103.

Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197 (1994).

Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, 1869 U.N.T.S. 401.

Association Agreement between the European Union and its Member States, of the one part, and Ukraine, of the other part. *Official Journal* L 161, pp. 3-2137 (29 May 2014). Available at https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A22014A0529%2801%29 (visited 4 Nov 2021).

United States-Mexico-Canada Agreement (USMCA), U.S.-Mex.-Can., agreed to 1 Oct 2018. Available at https://ustr.gov/sites/default/files/files/agreements/FTA/USMCA/Text/20_Intellectual_Property_Rights.pdf (visited 4 Nov 2021).

Regional Comprehensive Economic Partnership (RCEP), agreed to 15 Nov 2020. Available at https://rcepsec.org/legal-text/ (visited 4 Nov 2021).

WTO, 'Article XX General Exceptions' (n.d.). Available at https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art20_e.pdf (visited 4 Nov 2021).

Appellate Body Report, *European Communities and Certain member States — Measures Affecting Trade in Large Civil Aircraft*, WTO Doc. WT/DS316/AB/R (adopted 18 May 2011)

Appellate Body Report, *United States – Final Countervailing Duty Determination with respect to certain Softwood Lumber from Canada*, WTO Doc WT/DS257/AB/R (adopted 19 Jan 2004).

Appellate Body Report, *India – Certain Measures Relating to Solar Cells and Solar Modules*, WTO Doc WT/DS456/AB/R (adopted 16 Sept 2016).

Panel Report, *United States – Certain Measures Relating to the Renewable Energy Sector*, WTO Doc WT/DS510/AB/R (circulated 27 June 2019).

Government Measures

BPI France (31 Aug 2020) "Recovery plan for the Industry (Bpifrance. Actualités. "Plan de relance pour l'industrie")" Ministry of the Economy, Finance and Recovery. Available at https://www.bpifrance.fr/nos-actualites/plan-de-relance-pour-lindustrie (visited 4 Nov 2021).

European Investment Bank (EIB) (11 June 2020) "Germany: Investment Plan for Europe - EIB to provide BioNTech with up to €100 million in debt financing for COVID-19 vaccine development and manufacturing" EIB. Available at https://www.eib.org/en/press/all/2020-144-eib-to-provide-biontech-with-up-to-eur-100-million-in-debt-financing-for-covid-19-vaccine-development-and-manufacturing (visited 3 Nov 2021).

EIB (16 Feb 2021) "Smart Battery Systems 2 (EGFF)" *EIB Projects to be Financed*. Available at https://www.eib.org/en/projects/pipelines/all/20200614 (visited 4 Nov 2021).

European Commission (24 March 2020) "State Aid SA.56790 (2020/N) – DE – Federal Framework "Small amounts of aid 2020" ("Bundesregelung Kleinbeihilfen 2020")" European Commission

Document #: C(2020) 1953 final. Available at https://ec.europa.eu/competition/state_aid/cases1/202013/285205_2142884_55_2.pdf (visited 4 Nov 2021).

European Commission (25 March 2020) "Coronavirus: Commission issues guidelines to protect critical European assets and technology in current crisis" Press Release. Available at https://trade.ec.europa.eu/doclib/press/index.cfm?id=2124 (visited 4 Nov 2021).

European Commission (25 June 2020) "€6 billion German measure to recapitalise Lufthansa" EC Press Release. Available at https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1179 (visited 4 Nov 2021).

European Commission (27 Aug 2020) "31.007 European Commission (27 Aug 2020) "Coronavirus: the Commission signs first contract with AstraZeneca" Press Release. Available at https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1524 (visited 3 Nov 2021).

European Commission (17 Nov 2020) "Coronavirus: Commission approves contract with Curevac to ensure access to a potential vaccine" Press Release. Available at https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1524 (visited 3 Nov 2021).

Export-Import Bank of the United States (n.d.) "Export - Loan Guarantee / Insured Loans, Federal Award Identification Number (FAIN): 09450629ST101" by HSBC Bank USA N.A.. Available at https://www.usaspending.gov/award/ASST_NON_09450629ST1014_8300 (visited 4 Nov 2021).

Federal Ministry for Economic Affairs and Energy (20 May 2020) "Minister Altmaier: We want to better protect our safety and security interests in the healthcare sector; Federal Cabinet amends Foreign Trade and Payments Ordinance" Press Release Foreign Trade and Investment Law. Available at https://www.bmwi.de/Redaktion/EN/Pressemitteilungen/2020/20200520-altmaier-we-want-to-better-protect-our-safety-and-security-interests-in-the-healthcare-sector.html (visited 3 Nov 2021).

Federal Register (18 March 2020) "Competitive Funding Opportunity: Accelerating Innovative Mobility (AIM) Challenge Grants" Federal Transit Administration (FTA), US Department of Transportation (DOT). Available at https://www.federalregister.gov/documents/2a020/03/18/2020-05611/competitive-funding-opportunity-accelerating-innovative-mobility-aim-challenge-grants (visited 4 Nov 2021).

Federal Register (29 April 2020) "Filing Fees for Notices of Certain Investments in the United States by Foreign Persons and Certain Transactions by Foreign Persons Involving Real Estate in the United States" A Rule by the Investment Security Office. Available at https://www.federalregister.gov/documents/2020/04/29/2020-08916/filing-fees-for-notices-of-certain-investments-in-the-united-states-by-foreign-persons-and-certain (visited 4 Nov 2021).

Federal Register (10 June 2020) "Notice of Funding Opportunity for the Federal State Partnership for State of Good Repair Program" Federal Railroad Administration (FRA), Department of Transportation (DOT). Available at https://www.federalregister.gov/documents/2020/06/10/2020-12542/notice-of-funding-opportunity-for-the-federal-state-partnership-for-state-of-good-repair-program (visited 4 Nov 2021).

Global Trade Alert (1 May 2020) "United States of America: Prohibition on the acquisition of bulk-power systems from foreign adversaries". Available at https://www.globaltradealert.org/intervention/79395 (visited 4 Nov 2021).

Government of India Ministry of Commerce & Industry Department for Promotion of Industry and Internal Trade (17 April 2020) "Review of Foreign Direct Investment (FDI) policy for curbing opportunistic takeovers/acquisitions of Indian companies due to the current COVID-19 pandemic" Press Note No. 3(2020 Series). Available at https://dpiit.gov.in/sites/default/files/pn3_2020.pdf (visited 4 Nov 2021).

Government of India Department of Pharmaceuticals (16 Feb 2021) "Guidelines for implementing the provisions of Public Procurement (Preference to Make in India) Order (PPO), 2017 – revisions, related to procurement of Goods & Services in Medical Devices" Ministry of Chemicals & Fertilizers F.No. 31026/36/ 2016-MD (16 Feb 2021). Available at https://www.bmwi.de/Redaktion/EN/Pressemitteilungen/2020/20200520-altmaier-we-want-to-better-protect-our-safety-and-security-interests-in-the-healthcare-sector.html (visited 3 Nov 2021).

Government of India (14 Sept 2021) "Trade Notice 17/2021-22" Ministry of Commerce and Industry, Department of Commerce, Directorate General of Foreign Trade. Available at https://content.dgft.gov.in/Website/dgftprod/8dd79c40-6921-471e-bac7-689f2058fd82/Trade%20Notice%2017%20dt%2014-09-2021.pdf (visited 3 Nov 2021).

HHS (5 Aug 2020) "HHS, DOD collaborate with Johnson & Johnson to produce millions of COVID-19 investigational vaccine doses" US Department of Health & Human Services, Public Health Emergency, Medical Countermeasures.gov. Available at https://www.medicalcountermeasures.gov/newsroom/2020/janssenrapidard/ (visited 3 Nov 2021).

HHS (11 Feb 2021) "News Release from HHS.gov: Biden Administration purchases additional doses of COVID-19 vaccines from Pfizer and Moderna" US Department of Health & Human Services, Public Health Services, Medical Countermeasures.gov. Available at https://www.medicalcountermeasures.gov/newsroom/2021/covid19purchases/ (visited 3 Nov 2021).

Hong Kong TDC Research (15 Jan 2021) "China Updates Catalogue of Dual-Use Items and Technologies" Regulatory Alert – China – Business Laws and Regulations. Available at https://research.hktdc.com/en/article/NjQwMzQ0MzQx (visited 4 Nov 2021).

H.R. 133 Consolidated Appropriations Act, 2021. Available at https://www.congress.gov/bill/116th-congress/house-bill/133/text (visited 4 Nov 2021).

Ministry of Commerce of the People's Republic of China (19 Dec 2020) "National Development and Reform Commission, Ministry of Commerce Order No. 37 Measures for the Security Review of Foreign Investment". Available at http://wzs.mofcom.gov.cn/article/n/202012/20201203024662.shtml (visited 4 Nov 2021).

Ministry of the Economy, Finance and Recovery (30 April 2020) "COVID-19: Update of the foreign direct investment screening procedures in France" written by DG Trésor. Available at https://www.tresor.economie.gouv.fr/Articles/2020/04/30/covid-19-update-of-the-foreign-direct-investment-screening-procedure-in-france (visited 5 Nov 2021).

Moderna Press Release (16 April 2020) "Moderna Announces Award from U.S. Government Agency BARDA for up to $483 Million to Accelerate Development of mRNA Vaccine (mRNA-1273) Against Novel Coronavirus" Moderna. Available at https://investors.modernatx.com/news-releases/news-release-details/moderna-announces-award-us-government-agency-barda-483-million (visited 3 Nov 2021).

National Empowerment Fund (NEF) (26 March 2020) "R200m set aside for Black Business to fight COVID-19" NEF Media Statement for All News Editors. Available at https://www.nefcorp.co.za/wp-content/uploads/2020/03/Media-Statement-NEF-COVID-19-R200m-Fund-March-2020-website.pdf (visited 3 Nov 2021).

Press Information Bureau (PIB) (Govt of India) (19 April 2021) "Government of India announces a Liberalised and Accelerated Phase 3 Strategy of Covid-19 Vaccination from 1st May" Ministry of Health and Family Welfare. Available at https://pib.gov.in/PressReleseDetail.aspx?PRID=1712710 (visited 3 Nov 2021).

PIB (Govt of India) (20 May 2020) "Ministry of Defence approves procurement of 26 defence items only from local suppliers to boost 'Make in India" Ministry of Defence. Available at https://pib.gov.in/PressReleasePage.aspx?PRID=1625509 (visited 4 Nov 2021).

PIB (Govt of India) (1 June 2020) "Minimum Support Prices (MSP) for Kharif Crops for marketing season 2020-21" Cabinet Committee on Economic Affairs. Available at https://pib.gov.in/PressReleasePage.aspx?PRID=1628348 (visited 5 Nov 2021).

PIB (Govt of India) (10 Aug 2020) "Clarification: Indigenously manufactured items amongst negative list for imports" Ministry of Defence. Available at https://pib.gov.in/PressReleseDetail.aspx?PRID=1644780 (visited 4 Nov 2021).

PIB (Govt of India) (21 Sept 2020) "Cabinet approves Minimum Support Prices (MSP) for Rabi Crops for marketing season 2021-22" Cabinet Committee on Economic Affairs (CCEA). Available at https://pib.gov.in/PressReleseDetail.aspx?PRID=1657423 (visited 4 Nov 2021).

PIB (Govt of India) (3 Aug 2021) "Supply of Essential Drugs" Ministry of Chemicals and Fertilizers (3 Aug 2021). Available at https://pib.gov.in/PressReleasePage.aspx?PRID=1741879 (visited 3 Nov. 2021).

Reserve Bank of India (5 Nov 2020) "Exim Bank's Government of India supported Line of Credit (LoC) of USD 20.10 million to the Government of the Republic of Nicaragua" A.P. (DIR Series) Circular No. 04. Available at https://www.rbi.org.in/Scripts/NotificationUser.aspx?Id=11992&Mode=0 (visited 3 Nov 2021).

Reuters Staff (4 March 2020) "Germany bans export of medical protection gear due to coronavirus" Reuters Airlines. Available at https://www.reuters.com/article/health-coronavirus-germany-exports/germany-bans-export-of-medical-protection-gear-due-to-coronavirus-idUSL8N2AX3D9 (visited 3 Nov 2021).

South Africa Industrial Development Corporation (IDC) (24 March 2020) "IDC COVID-19 Essential Supplies Intervention" IDC. Available at https://www.idc.co.za/essential-supplies-fund/ (visited 3 Nov 2021).

South African Department of Trade and Industry (27 March 2020) "COVID-19 Export Control Regulation" Government Notices. Available at https://www.gov.za/sites/default/files/gcis_document/202003/43177rg11070gon424.pdf (visited 3 Nov 2021).

South African National Treasury, National Budget (February 2021) "Financial position of public-sector institutions". Available at http://www.treasury.gov.za/documents/national%20budget/2021/review/Chapter%208.pdf (visited 5 Nov 2021)

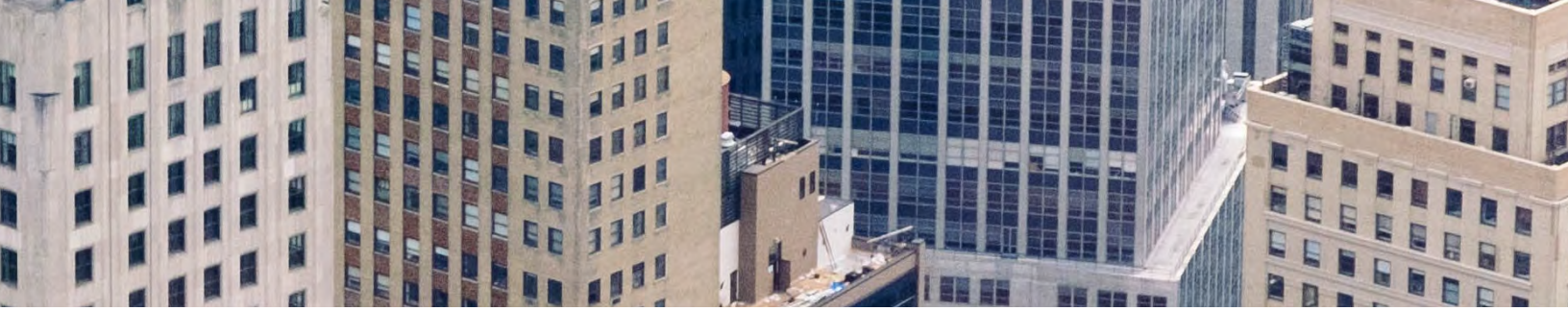
The Economic Times (26 Nov 2020) "Govt launches 'Mission Covid Suraksha' to help accelerate vaccine candidates" ET Healthworld.com. Available at https://health.economictimes.indiatimes.com/news/industry/govt-launches-mission-covid-suraksha-to-help-accelerate-vaccine-candidates/79419525 (visited 3 Nov 2021).

The Presidency of South Africa (21 April 2020) "Statement by President Cyril Ramaphosa on further economic and social measures in response to the COVID-19 epidemic". Available at http://www.thepresidency.gov.za/speeches/statement-president-cyril-ramaphosa-further-economic-and-social-measures-response-covid-19 (visited 4 Nov 2021).

The White House (17 Feb 2021) "Fact Sheet: President Biden Announces New Actions to Expand and Improve COVID-19 Testing" Briefing Room Statements and Releases. Available at https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/17/fact-sheet-president-biden-announces-new-actions-to-expand-and-improve-covid-19-testing/ (visited 3 Nov 2021).

U.S. Small Business Administration (n.d.) "First Draw PPP Loan". Available at https://www.sba.gov/funding-programs/loans/covid-19-relief-options/paycheck-protection-program/first-draw-ppp-loan (visited 4 Nov 2021)

United States International Trade Administration (28 June 2021) "U.S. Department of Commerce's Aluminum Import Monitoring System to Begin Requiring Licenses" Press Release. Available at https://www.trade.gov/press-release/us-department-commerces-aluminum-import-monitoring-system-begin-requiring-licenses (visited 4 Nov 2021).



METHODOLOGICAL APPENDIX

In order to catalogue the policies of interest, we gathered information about web-based databases which had already begun to track the role of government intervention during the pandemic. Our search uncovered eight relevant databases (Box 1), which had various lists of pandemic-related policy responses.

Box 1. Web-based sources for relevant policy responses

International Monetary Fund (IMF): https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

Provides narrative summaries of key economic responses by governments to limit the human and economic impact of the pandemic. Includes 197 economies.

WIPO COVID-19 IP Policy Tracker: https://www.wipo.int/covid19-policy-tracker/

Tracks information on measures adopted by IP offices in response to the COVID-19 Pandemic

International Trade Centre (ITC): https://www.macmap.org/covid19

Catalogue and mapping of temporary trade measures (import and export) imposed by countries in response to COVID-19

OECD Policy tracker: https://www.oecd.org/coronavirus/country-policy-tracker/

Comprehensive catalogue of all measures in various categories imposed by OECD countries (includes fiscal and monetary, employment and social and health policies)

Oxford COVID-19 Government Response Tracker: https://www.bsg.ox.ac.uk/sites/default/files/2021-06/BSG-WP-2020-032-v12_0.pdf

Working Paper (regularly updated) with a catalogue of government responses to COVID-19 as well as analysis of how those measures correlate to changes in COVID-19 cases, hospitalizations and deaths.

Box 1. *(continued)*

Yale School of Management Financial Response Tracker Visualization: https://som.yale.edu/faculty-research-centers/centers-initiatives/program-on-financial-stability/covid-19-tracker

Catalogue and mapping of individual government economic financial policies introduced or amended to combat the negative effects of the coronavirus outbreak

Global Trade Alert (GTA): https://www.globaltradealert.org/

Comprehensive catalogue of all government measures imposed since 2009, identified primarily by type of measure and whether it is trade "liberalizing" or "harmful".

Institute of International Finance (IIF): https://www.iif.com/Portals/0/Files/Databases/COVID-19_responses.pdf?ver=2020-07-30-173749-083

Catalogue of financial and stabilization policies imposed by developed country markets, as well as the IMF and the G20.

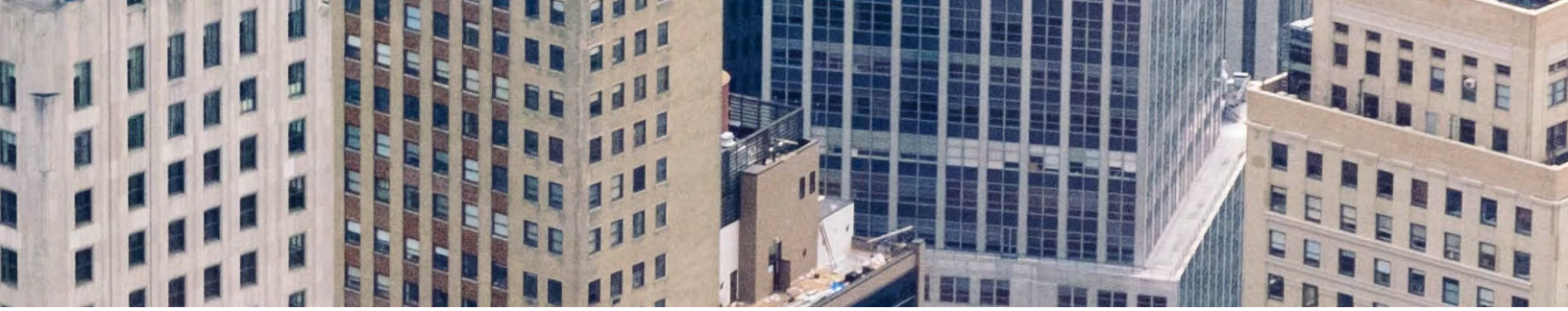
A preliminary assessment of these databases and documents indicated that the Global Trade Alert (GTA) database could function as our primary data source, while relying on the other web-resources as secondary sources, especially where they contain information not available in the GTA dataset. This assessment is based on the comprehensive nature of the GTA database, as well as the related information for each government intervention. Each measure is categorized within a specific typology of government intervention, and further flagged as being either "harmful/discriminating" (designated as red polies), "likely harmful/discriminating" (designated as amber) or "liberalizing" (designated as green) with respect to global trade (Evenett 2019).[17]

To further support the decision to rely primarily on the GTA database, we validated the information that was presented in GTA against the other databases mentioned above using the following assessment questions:

- How much and what kinds of overlap in information is there between the GTA and the other three databases?
- How easy is it to determine this overlap, if any exists? For instance, do the databases use a variable that can be used to link both databases (e.g. name of the state act)?
- Can the other databases provide complementary information not found in GTA that is relevant to this research?

The data gathered includes measures beginning on March 1, 2020, as indicative of the beginning of government awareness and intervention in response to the pandemic. The database was published on July 31, 2021 and assayed on August 31, 2021 by downloading into Excel. We downloaded all "harmful/discriminating" and "likely harmful/discriminating" policies that impacted products listed in the GTA dataset whose implemented dates encompassed the two dates listed above and that are still in force as of August 31, 2021.

[17] A further comprehensive description of the GTA's methodology can be found in Evenett 2019.



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