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Sustaining Trade during COVID-19 Pandemic: Establishing a Conceptual Model Including COVID-19 Impact

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Abstract: The conceptual research aims to identify antecedents conducive to bilateral trade during the COVID-19 pandemic. Considering the relevance of bilateral trade for foreign policy and economy studies, there is a need for a renewed framework in times of extreme economic instability. As international commerce is essential for improving the country's economy, we have examined how economic distance, population, trade percentage of GDP, exchange rate, and political changes interconnect and relate to COVID-19, influencing trade flows. This conceptual paper illustrates the likely impact of COVID-19 on international trade by exploring pandemics' effects on standard trading parameters such as GDP, distance, policy stability, and population. We model the resulting shock as a multifaceted variable reflected in capital underutilization, manufacturing output decline, international trade costs inflation, production costs inflation, decrease in demand for certain services and shift from everyday needs towards activities that exclude the proximity between people, e.g., proclivity towards virtual market products. The sudden decrease in GDP and bilateral trade, as well as FDI, is amplified by further development of pandemics' long-term consequences. We take COVID-19 to be a technological, financial, and policy shock significantly influencing international trade and economic development and argue that it will have a varying impact on diverse sectors and economies. The paper offers preliminary insight into the pandemic-related economics that are unfolding and deduce recommendations on positive changes in trading policy to fully leverage on arising trading opportunities and point to potential research directions.

Keywords: COVID-19; political relations; international relations; bilateral trade; gravity model application

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1. Introduction

Impediments on bilateral trade and closures due to an emergent situation propelled by COVID-19 deepened the public debt and had two detrimental effects. First, imports and exports were temporarily suspended, posing a major shock for the economy and causing a shortage of resources. Next, mass layoffs and record unemployment heightened the financial losses, leaving citizens reluctant to spend on anything but the essentials. Trade growth sharply declined consistently with the emergence of the pandemic, and this fall extended even more extremely through the second quarter of 2020. The value of year-on-year trade of goods decreased by 18% and 21% for services, respectively. Economic and fiscal implications for trade were reflected in an unprecedented decline in demand. The World Health Organization referred to the emerging pandemic as the greatest blow to the world's economy leading to a "deepest global recession since the Second World War" and the 2009 Great Depression [1]. Due to its highly infectious nature, the virus spread was accelerated by traveling through cardinal global economic transport corridors. International reliance on bilateral trading and mutual associations has further increased the transmission of the infection. Sectors that were previously feeble and regressive were further exposed to unexpected disruptions.

Nevertheless, new global trade trends emerged, transforming the existing sale channels, leading to fresh opportunities, and even opening up unexpected market segments [2]. Merchants that anticipated this momentum leveraged the conveniences enabled by new technologies and pioneered by developing and providing novel products and services. In doing so, they established resiliency by introducing portfolio and supply chain diversification [3]. As expected, the demand for medical goods and Personal Protective Equipment (PPE) grew extensively, raising the sales of protective products by 186% compared to 2019 [4]. The Tech industry, including software and hardware providers, experienced growth as the need to equip home offices, perpetuated by the introduction of the remote working policy, increased.

Comprehensive research into the pandemics' influence on bilateral trade should apply the standard gravity equation model treating COVID-19 as an economic shock influencing basic macroeconomic relationships. Researchers should consider such performance measures as unemployment, consumption rates, import and export levels, and inflation. Furthermore, there is bound to be an effect of COVID-19 on supply and demand patterns. The pandemic can be framed either as a technological shock, policy shock, or financial shock. Due to its unpredictable and volatile nature, it caused an economic downturn in export markets, a crash in stock prices, and had a negative effect on foreign investment.

According to some scholars, adaptive economic input-output models are best suited for assessing direct and indirect economic losses from natural disasters [5–7]. While these models provide relevant insight into the effects and crisis recovery rate, they often lack validity and support due to the rare instances in which they apply. For this reason, we consider the gravity model to be more adequate in the current situation.

The gravity model has extensively been used as the universal tool for analyzing trade flows, as reflected by numerous studies [8–11]. Although there has been some criticism at first, the scholars have been trying to extend the traditional base of the gravity model, as well as adopt new econometric methods, to estimate its parameters with more exactness. While some of those papers introduce new economic approaches, others examine the gravity model's econometric potentials [11]. As soon as new interest appeared in the "Economic Geography" in the 1990s, the gravity model turned to a means to explain and assess global trade flows. Due to its robust economic foundation, a vast amount of research has been carried out to create gravity-type equations, including other variables that could hinder or ease bilateral trade patterns. For this reason, the main assumption of the model dictates that the bilateral trade is positively correlated to the goods of trading parties' GDP and adversely correlated to the distance [12].

The gravity model is often considered essential and the most widespread schema in the field of economy. There are more than hundreds of papers that have used it to analyze and assess the impact of different variables of international trade. Thanks to this model, researchers can build causal relationships between variables of interest and commerce rather than merely assuming the existence of such a relationship [13,14]. All the studies utilizing the gravity model aimed to examine the impacts of distinct variables of commerce.

Recently, Heilmann studied the influence of prohibitions on bilateral trade, examples include US rejection of French wine in 2003 or boycotts of Danish products by Muslim countries in 2005 [15]. The results of his study show that boycotts have severe negative consequences for bilateral trade. Political tensions may emerge at a consumer level, where consumers may feel reluctant to consume the goods and services of the countries with which their home country has tension or conflict. Individual consumers may act in this way to support local production.

Political relationships among countries can be classified as normal, friendly, tense, and threatening. The increasing number of cases subjected to the International Court of Territory and Other Conflicts points to nations' reluctance to start a war because of weak political relationships. Considering that real political conflicts between nations are less extreme, many researchers began to analyze the consequences of moderate political disagreement regarding international trade by applying the gravity model. Underlying

political relations can either hinder or facilitate these processes. We employ a research framework to explain the policy impact on trading relationships.

The study will consider the determinants driving bilateral trade in the new COVID-19 altered economic landscape. We explore the relevance of such variables as economic distance, population, trade percentage of GDP, exchange rate, and policy changes on trade flow among states in international trade patterns. As international commerce is essential for economic improvement, we need to identify the factors influencing smooth trade flow between countries.

While prior studies on the subject matter treated the ongoing pandemics as purely supply or demand shock or even a combination of both, to our knowledge there is no comprehensive framework on COVID-19 that clusters it in terms of technology, finance, and policy. As such, our analysis of hot-debated comparative policy, fiscal and digital interventions allow us to explore in-depth diverse dimensions of a single global economic shock and forces that lead to the intertwined supply-demand spill-over effect. As the situation is still unfolding, we leverage on preceding ample empirical evidence of single-focus academic work on outcomes of the pandemics and add to the emerging body of literature on the issue of immediate concern. While the discussion on supply vs. demand is relevant and instrumental, the problem of how to achieve an optimal solution to balance economic disruptions remains unresolved. We offer some preliminary suggestions into how managing digitization, budget deficits, and government regulations concerning sectoral restrictions can be deployed to mitigate risks, increase health expenditure and minimize unemployment. Moreover, our conceptual study builds on the existing theoretical grounds concerning global trade patterns and models the health crisis as disparate shock types, which allows it to be incorporated into the standard gravity model. For leaders to improve and strengthen the economic viability and sustainability, it is necessary to identify which factors contribute most to trade and which features are beneficial to bilateral relations and provide growth opportunities.

2. Background of the Study

2.1. COVID-19 Pandemic

As most countries have, immediately after the onset of COVID-19, implemented mandatory restrictions on routine trade operations and emergent shutdown and lockdown policies, the global economy experienced a major blow due to the spill-over effect of national confinements on affiliated economies through existing trade linkages. The COVID-19 outbreak's disastrous impact has so far caused massive damages to nations worldwide, with ravaging instances of infected persons, morbidity, unemployment, bankruptcy, business closures, and poverty rates increasing by the day. According to the report of Vitenu-Sackey and Barfi, the number of infected persons reached 72,851,747 in December 2020, while deaths were counted at 1,643,339 [16]. Scholars and researchers were rapidly immersed in scrutinizing the economic effects of the ongoing crisis and rendered diverse analyses of the pandemics' impact on trade linkages [17–20]. The World Bank reports that the pandemic wreaked havoc and undermined the sound global poverty reduction attained over the last twenty years, rising poverty rates and taking a toll on already under-developed economies, such as Low-Income Countries (LICs). Activity in LICs in 2020 contracted by 0.9%, promulgating the first aggregate contraction within a generation [21]. As per capita incomes, drawbacks were recorded in over 90% of Emergent and Developing Market Economies (EDMEs), infringing a decade of per capita income gains for a quarter of EDMEs.

The smallest economic crises are known to cause a butterfly effect, prompting large-scale changes in certain industries or entire economies. Small focal points of socio-economic disruptions can, by taking hold of key international intersections, become a source of a major global emergency affecting public health, livelihood, and economic welfare. Such disruptions in the existing supply chains and international trade are deemed economic shocks—temporary fluctuations impeding the smooth trade flow. Considering markets are connected, the impact of shocks can spill from one segment to another, moving across many

markets and causing severe macroeconomic implications. When disaster arises, scholars often employ auxiliary variables such as GDP, distance, population, tension, import, and export to measure short-term effects of disturbances to capture the economic outcomes and render the projection of long-term recovery. In rare instances, a crisis can outgrow being just a severe challenge for routine business and propel a revolution in existing trade, supply, production, and entrepreneurship paradigms. Drivers of economic revolutions are evaluated in relation to impediments that caused merchants to undergo transformation. These include delivery process bottlenecks, including export bans, trade impediments, shipment delays, and operational drawbacks, such as communication interruptions, power supply shutdowns, production plant closures, and physical restrictions to supplying regular consumers. COVID-19 was a source of both supply and demand shocks, as is usually the case with natural disasters. Most economic shocks fall under the demand category when they arise as a result of income losses or they are classified as supply shocks, emerging with the sudden inflation and increase in production costs. However, the COVID-19 crisis encompasses both collapses at the same time [22].

Accounting for the supply changes, pandemics propelled disturbances in the production and rise in the cost of commodities. On the demand side, outbursts caused considerable shifts in public and private spending patterns. Revolution is anchored in the concurrent emergence of several interrelated entrepreneurial challenges, yielding a need for alternative solutions. At the onset of such market conditions where all the existing revenue streams are cut off, organizations are faced with a crisis-induced opportunity to reorganize, learn, expand, redefine and reinvent. In the aftermath, some will go out of business; others will barely sustain their operations, while several will profit and emerge more competitive than ever. Although the majority could benefit from the change, not all are affected to the same extent or endowed with the same opportunity for progress. For instance, most studies found that sustainable growth during COVID-19 hinges on open innovation, digital transformation, product diversification, and innovation in service delivery [3,23]. When physical restrictions were put into place, trade proceeded in a virtual environment. However, such transition requires substantial technological infrastructure, and not only do certain organizations lack resources to catch up, but entire economies are unprepared for major advancement. Impoverished and developing economies lack the technological foundation to enable modernization, as their internet coverage in rural areas and access to ICT is almost nonexistent.

2.2. Gravity Model Theory Application and the Previous Studies Overview

The most applied method to study global trade flows is gravity model. The gravity model is established on the economic size, trade cost, and trade flows. It is considered potent and useful due to its applicability, explanatory power, and robustness. Despite its advantages, the Gravity model has its limitations. Like many others, the gravity model cannot elucidate the impact of all aspects influencing international trade. This includes historical similarities, political relationships, and culture, and these are usually regarded as fixed. Most of the papers studied the gravity model's impact only based on the country's size and distance. Still, such studies' objectives were to determine whether political tensions have an impact on trade flow.

Ottaviano used the model to study the adverse organizational elements influencing bilateral trade flows [24]. Bernard used a gravity model to explore the relationship between intensive and extensive margins to trade shocks, while McCallum implemented it to investigate trade flows in the case of Canada and the US [25,26]. These are regarded as theoretical approaches to study the gravity model.

Since the gravity equation has been fascinating scholars for years, different researchers have attempted to explore it from different angles. Some of the most recent research has added weight to the current literature [27–31]. A group of Dutch economists developed the first mathematical equation of gravity-type model under the guidance of Tinbergen, and it was later empirically tested. In 1962, Tinbergen used this equation in his seminal paper

titled Shaping the World Economy, as well as supervising the Ph.D. thesis of Linnemann four years later. In this paper, Tinbergen is acknowledged as the first scholar to identify the gravity model econometrically to study global trade flows. Furthermore, Tinbergen's research motivated many more papers by his apprentices. Many authors worked to further refine the theoretical aspects of the gravity equation [32–34].

Anderson, the first economist to have laid the theoretical base for the gravity equation, assumed that products differed according to their country of origin and the expenditure of Constant Elasticity of Substitution (CES). Such outstanding research of Anderson was founded on another study by Armington [35]. Anderson obtained the gravity equation by incorporating the product differentiation approach that elaborates on the existence of income in this model. Several other relevant papers were made to form the gravity model's microeconomic bases [36–38]. Bergstrand also established a connection between trade conceptual framework and bilateral trade, accounting especially for the supply end. Many economists contributed to the growth of trade theory [39–43].

The gravity model is considered flexible, allowing it to be incorporated across a broad range of equilibrium structures in the analysis of the linkages between labor and trade markets, environments, capitals, climate change, and many others. Pivotal aspects of research modeling comprise exploration, description, explanation, and prediction [44,45]. Yet, the gravity model is very much appreciated on the grounds of its predictive capacity. Empirical predictions regarding trade flow range from 60 to 90% accuracy concerning the aggregate and sectoral information for goods and services alike [46].

Many arguments were advanced in favor of the model, and they are often provided by their own merit or in combination with other evidence. First and foremost, the model is compelling by its very intuitive nature. Secondly, the gravity model of trade is a structural model alongside a strong theoretical base. Such a characteristic makes the gravity framework especially suitable for counterfactual examination, like quantifying trade policy impacts. It demonstrates a realistic general equality ambiance that can accommodate multiple states at the same time. Therefore, the gravity model may capture the market cooperation and trade policy shifts the domino effect. Next, the gravity structure is flexible and can be integrated within a broader equilibrium. Thanks to its predictive power, the gravity framework was utilized. According to Yotov et al., empirical gravity equations of trade patterns always lead to staggering predictions [28].

3. Factors Affecting International Relations

3.1. COVID-19

To account for the effect of pandemics among nations, not only the immediate outcomes should be examined, but also subsequent technological transformation induced variations. We argue that COVID-19 will have a negative short-term impact on bilateral trade for most nations and a long-term indirect influence on underdeveloped economies. It will affect GDP, trade linkages, trade associations, and income. We theorize that resulting poverty in underdeveloped economies and rising unemployment can ultimately affect the population, as specialization will decrease, GDP will shrink, exchange rates will vary, and intermediate effects, such as lack of access to medical healthcare services, lack of finances, and undernourishment will lead to a reduction in population. The research model is depicted in the Figure 1 below.

Figure 1. Research model.

3.1.1. COVID-19 as a Demand Shock

Economists may diverge in their views on how to best assess the COVID-19 variable, but many agree that it can be regarded as a hybrid supply-demand shock generating domino effect. Brinca, Duarte, and Faria-e-Castro explain this duplicity as a logical consequence of the spill-over effect [47]. They argue that at the supply end, the lockdown policy cost the working population their income and savings, causing them to initiate demand shock when they were forced to restrain from all non-essential purchases. Vice versa, COVID-19 precipitated negative supply shocks which also caused demand shortages [48,49]. According to some scholars, pandemics differs significantly from a conventional demand or supply shock in that as a health crisis, it consists of both [50,51]. A stream of economists arguing that the demand shock is more dominant draws conclusions from changes in firms' behaviors, perceptions, and forecasts [52,53]. Changes in consumer spending were central to many recent studies exploring the effects of COVID-19 [54–58]. While maintaining that disruption was significant on both ends, Meyer, Prescott, and Sheng used the Business Inflation Expectation Survey to examine how most firms perceive the pandemics [59]. According to their analysis, most of the companies framed the crisis as a demand shortfall [53]. Although with high relevance, supply shock advocates draw conclusions less from evidence and more on inferences. Some of the more robust research evidence examining the supply shock was generated using econometric models [47]. On a more moderate note, Candia et al. found that, as opposed to households that ultimately experience it as a supply disruption, only some companies perceive the crisis as a supply shock [60].

The emergent crisis has had an immediate and adverse effect on the travel and hospitality industry, with ongoing deterioration in demand for travel services extending in 2020 and 2021. COVID-19 can be interpreted as a demand shock wherein more consumers and households order fewer products and services that entail human interaction, such as entertainment and sporting events, transportation, tourism, and recreation. The global market demand shifts to consumption of virtual entertainment, essential commodities, and health-protective aids [61]. Due to the outburst, global manufacturing output declined significantly in 2020, signaling the largest global output fall since the Great Depression. Impact across sectors was unsynchronous, with uneven outcomes for different industries. At times of crisis, the demand for durables, such as cars, real-estate, and appliances tend to decrease [62,63]. Pharmaceutic manufacturers, food producers, rubber products, and chemical manufacturers suffered a significantly milder blow in developing countries and industrialized economies than machinery and equipment, textile, and wearing apparel producers [4]. The silver lining is in that medical equipment, PPE producers, and pharmaceutical manufacturers around the globe recorded a sudden sales growth, making a profit out of an imminent situation, so much so that different industrial manufacturers with sufficient resources and power plants at their disposal shifted towards production of protective equipment to support their operation [64]. At the same time, they engaged in corporate

social responsibility. Organizations lacking in resources have to pursue cross-sectoral cooperation with larger corporations to accommodate the market needs [65,66]. Due to the significant decrease in output, motor vehicles, machinery, and apparel manufacturers aligned their processes to generate supply for global demand of essentials and ensure sustainability. The COVID-19 variable is framed as a financial, technological and policy shock, as depicted in Figure 2 below.

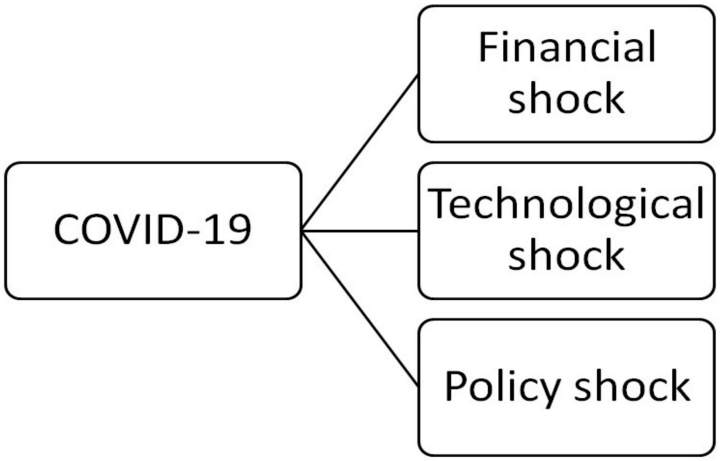

Figure 2. COVID-19 variable.

3.1.2. COVID-19 as a Financial Shock

Fundamental trade and economy drivers, Small and Medium Enterprises (SMEs), pertaining to a fraction of entities that are specifically vulnerable to pandemic-induced shocks experienced a major disruption in the routine business [67]. COVID-19 broke into SMEs' and microenterprises' ecosystems, decreasing demand for their offering. Virus interfered with both supply and demand. The implications are daunting. According to the study by OECD (2020), a staggering number of enterprises had to completely shut down their operation to avoid debt and bankruptcy, amounting to 50% recording severe revenue loss and one-third heading to full closure within one month. Restrictions and national shutdowns caused hardship for informal businesses, such as tourism, hospitality, recreation, and catering services providers. Furthermore, the immediate global fiscal response to the onset of the crisis was the deployment of fiscal policies to increase health expenditure, ensure wages and allow companies to retain workers, and prevent mass unemployment [68]. Government response across countries was primarily aimed at preventive health measures. Regarding macroeconomic response, fiscal and monetary aid was provided to entrepreneurs to ensure business sustainability and minimize unemployment. In some countries, the government ensured compensation to laid-off employees. The provision of pensions, social welfare payments, and compensations was intended as a fiscal stimulus to support household spending, yet if these payments are one-off, they are likely to be spared than spent. However, governments' spending has exceeded the revenue collected through taxes, resulting in budgetary deficits and public debt. Additionally, in various countries, regulatory responses to the COVID-19 pandemic have potentially created a new transnational health policy [69]. In India, regulatory restrictions have negatively impacted foreign investors leading to investor-State dispute settlement (ISDS) claims [70]. COVID-19 measures are covered by international defenses and as such are unlikely to be successful [71]. However, potential lawsuits and tension create a less favorable investment climate and present a risk for future investing. The often-invoked comparison between the COVID-19 Recession and Global Financial Crisis illustrates how the financial shock can be regarded—it is inflicted on economies' financial sector through cross-border trade linkages [72,73]. Financial shocks impact global trade by disrupting stock markets, prices, and exchange rates, and to some extent, the stock markets are currently driven by investors'

predictions on the policy restrictions and the duration of the crisis. The fiscal packages deployed in the current crisis are three times higher compared to those executed at the onset of the 2008 Financial Crisis [74]. The average fiscal package during the primary wave of the pandemic was 5.2% of GDP, and this percentage was 1.4 during the Great Recession, respectively. The results of Goolsbee, Austan, and Chad Syverson's empirical study across different policy regimes point that lock-down measures account for a moderate share of economic activity, i.e., legal restrictions account for 7% out of the 60% decline in the consumer traffic [61]. Bearing in mind that economists usually agree on international trade being an essential explanandum of the financial crisis, concern about the reversed aggregate after-effects of the financial crisis on bilateral trade is a legitimate concern. Whether the financial collapse will bring about the decline in import and export levels may be begging the question. Yet, there are not many studies on the matter. Financial shocks can easily be incorporated in the standard gravity model to examine the impact on trading parties' import and export levels. For instance, Ma and Cheng have, by dividing all previous financial shocks into the banking crisis and currency crisis, empirically tested the impact on trading capacity using the gravity model [75]. They applied bilateral trade, and macroeconomic and geographic information on fifty countries to estimate the repercussions on international trade. In the same line, Panda, Sethi, and Kumaran deployed a gravity model to examine whether determinants changed significantly after the occurrence of the 2007/2008 Financial Crises [76].

Proposition 1. *COVID-19 financial downturn has an adverse effect on trading parties' export flows.*

3.1.3. COVID-19 as a Technological Shock

Organizations worldwide caught a big break with the opening of the new inexhaustible market segment driven by the demand for medical and protective equipment and the transition from a physical to a digital environment [77]. Early adopters of digital transformation and new technology gained momentum to supply regular consumers and offer their products and services to unrelated business entities. Pandemics-induced digitization advanced the utilization of Information and communications technology (ICT) products and services and provided further opportunities for modernization and activity expansion to traditional businesses [78]. Given the strict confinement and distancing measures, virtually all activities were carried out online, including shopping, communication, entertainment, public administration, schooling, and conferencing. For businesses constricted to a physical environment, enforced digitalization meant improvisation and inventing new ways of providing existing services via cutting-edge technology [79]. For large corporations and SMEs alike, the novel market situation provided an opportunity for exploring the potential of omnichannel and cross-country sales using diverse platforms and exploiting the opportunities for marketing, branding, and advertising to a wider population. Enterprises that were at first forced to focus on the altered mode of doing business or redefining their activities and processes to utilize existing capacities to meet the new demand for PPE will, post hoc, have a wider offering of alternative products. Some may even choose to pursue the new line of development post-crisis. Organizations that were narrowly focused on their core activity, neglecting technological evolution and disregarding the necessity for innovation will, due to the coronavirus, benefit from overlooked opportunities for growth and changes that would otherwise be lost. To cope with the economic shock, enterprises have introduced a digitally supported remote working policy, which became the mandatory solution to conducting usual business activities as well as the commonly accepted alternative source of leisure [80,81]. Agostion, Amaboldi, and Lema empirical study revealed that digital technologies are a potent tool for public service delivery when experiencing difficulty with on-site operation [82]. In the same line, Argüeles et al. argue that in face of adversity such as the current pandemic, ICT has never been more essential for business survival [83]. They provide examples of how companies

can leverage cutting-edge technologies, such as augmented reality, the Internet of Things (IoT), and artificial intelligence to advance their offering. Urgent implementation of digital transformation can be framed as a technological shock requiring trade-offs between virtual and physical activities [84]. Manufacturers' technology parameters account for multiple dimensions and processes, such as building manufacturing plants, designing products, obtaining patents, developing, and expanding distribution and sales channels, while improving brand awareness through promotion [85]. Technological shocks can be applied in a general equilibrium context to capture shifts in trade flows when they are integrated into the gravity model. For instance, to account for the small shares problem, Komorovska et al. employed the gravity model to quantify advances in import technology [86]. This allowed them to predict the technological change resulting from alternations in trade barriers, assuming these modifications would lead to variations in import volumes. Fillipini and Molini applied the gravity equation to examine trade flows among East Asian industrialized and developed countries by proposing a technological distance as a suitable variable for explaining the significant international technological gap [87]. Digital health was characterized by Adler-Milstein as consisting of computing platforms, connectivity, software, and sensors [88]. Harvard Business Review ranked Scandinavian countries, such as Sweden, as among the most resilient and technologically prepared due to robust digital platforms, as opposed to Italy and India [89].

Furthermore, transitioning to a virtual environment was the tipping point providing smaller and financially less viable enterprises with an opportunity to engage in cross-border sales without having to make substantial investments. The costs of reaching new international consumers are considerably lower in an interconnected overreaching virtual ecosystem. As numerous economists and international relations specialists have established before, trade flows between countries are more likely to be affected by countries' economic development. That is to say, if the corona-crisis has stimulated a technological revolution in trading, the recent advancement in production and service delivery will ipso facto lead to trade intensification.

Logistics operations are exacerbated by international import and export bans and lockdown decisions. Many countries have relied on domestic supply chains, being propelled by the ongoing pandemic. Following in their footsteps, international merchants also begin to favor local suppliers. Not all shipping segments were affected equally by coronavirus outburst, and the impact varied across air shipment, road, and maritime delivery activities, as well as across different countries and regions, depending on implemented containment measures, travel bans, and restrictions on movement. Considering that 80% of international trade is carried out via maritime shipments, port calls' trajectory is a sufficient indicator reflecting interruptions or suspension in bilateral trading activity [6]. By May 2020, global port calls have declined to approximately 80% of the calls compared to the same period in 2019. A decline in logistics activity highlights the influence COVID-19 has had on global trade, and the distance variable becomes an especially important determinant of the bilateral trade intensity. The pandemics were a gamechanger for enterprise' logistics, too. To adhere to mandatory social distancing 'no contact' measures, merchants had to come up with remedies that enable them to retain regular trading volume and supply customers using a more convenient delivery manner than simple 'pick-up points', preferably one entailing final-mile solution. Instead of shipping through routine road and cargo, businesses have resorted to ad hoc solutions, such as revolutionary drone delivery, leveraging on IoT and new technology. Innovation in delivery proved ideal for reaching consumers in distant rural areas, and it is already plausible that it will constitute the future of light-merchandise transfer.

Proposition 2. *Productivity-enhancing technologies have a positive impact on the import and export of advanced and emerging economies.*

3.1.4. COVID-19 as a Policy Shock

The preventive and safety policies, including closures, shutdowns, lockdown, restriction on movement, import and export bans, and social distancing measures during an ongoing catastrophic event, caused a policy shock and had an immediate effect on all economies, and through their trading linkages, on partner economies. The duration of the shocks is currently unpredictable. However, based on analog prior disastrous events related to highly infectious disease contagion and existing preliminary epidemiological projections, certain assumptions can be made. Keeping in mind that the pandemics have a heterogeneous effect and policy stringency varies among countries depending on the severity and number of infected persons, as well as their financial capacity to survive the strict lockdown, the COVID-19 will prompt different policy responses and have a varying impact on policy stability across nations, accordingly. In the first quarter of 2020, more than 80 nations and custom territories have implemented bans and restrictions to mitigate the health risks, causing reprehensible damages to the economy [22]. Business closures and lockdowns further precipitated the crisis's repercussions, causing labor shortages, mass layoffs, payroll reductions, and a decrease in the demand for retail merchandise. Due to the imposed restrictions, the labor market experienced a sharp downturn [90–92]. Trade barriers spurred great financial losses and imposed severe challenges to import-dependent nations. For instance, importing countries have restricted trade by enforcing tariffs on medical products and PPE, reaching up to 55% of the import value [93]. The inability of some countries to export domestically manufactured medical products lead to an increase in procurement costs [94]. Extreme restrictions aimed at containment were imposed across societies, cities, and municipalities, affecting peoples' livelihood and behavioral patterns—shifting from active engagement in social interaction-related activities to resorting to virtual substitutions [95]. Whereas some sectors suffered a blow as a direct result of lockdown policy, as in cases where the production was temporarily shut down, the more holistic approach would be to consider both direct and indirect effects of COVID-19, fear being one of the major causes of decrease in demand [96]. Due to it primarily being a health risk, consumers may opt for restraining themselves from purchasing or using certain services that entail social proximity regardless of there being a mandatory ban or not [97]. Sabat et al. explored public attitudes towards imposed restrictions among European countries [98]. They found that although restrictions are harsh, citizens' confidence in government policies is not shaken. Akter et al. provided empirical evidence of COVID-19 imposed restrictions, including lockdown, social distancing, and travel bans were the main cause of significant changes in consumers purchasing and consumption behavior [99]. This is in line with Coibon et al.'s findings that restrictions cause a significant negative effect on spending [100]. Andersen et al. conducted an empirical study to examine how social distancing measures impact spending dynamics [101]. They found that in the case of Denmark and Sweden, most of the economic contraction was virus-induced and independent of policy changes, as their research points that freezing the activity in sectors requiring social contact is associated with relatively small losses in aggregate spending. However, as standard monetary policy can offset certain aggregate demand shocks, Brinca, Duarte, and Faria-e-Castro argue that other policies can be used to counter supply shocks [47]. The manner in which policymakers can ensure economic sustainability is by stimulating sectors that are excepted from the lockdown ban and are not prone to pandemic-related concerns. To successfully implement such incentives, the government must distinguish clearly between demand and supply shocks and have a full understanding of sectoral susceptibility and reactivity to such disruptions. Guerrera et al. explored the possible effect of diverse policies on the economy. They argue standard fiscal stimulus is less effective during COVID-19 due to temporary closures of entire industries. Furthermore, they suggest that monetary policy will yield magnified effect, while optimal policy entails closing of contact-dependent sectors and providing full insurance payment to lay off employees [48].

Proposition 3. *COVID-19 related restrictions and policy changes have a negative effect on trade openness.*

3.2. Population

The population tends to increase trade flow. More precisely, the population rises specialization, which in turn impacts trade positively. However, not all of the previous studies correspond to this finding. Some studies report that only export and import are considered capital intensive, while the association between population and trade flow proved negative. Additionally, when estimating the impact of population on trade flow, it is essential to consider the estimation period's length. While the population may influence trade positively short term, it may prove adversely in the long run. The short-term positive influence is accounted for on the ground of labor increase, stimulating the specialization level, and it will lead to more products to be exported. Conversely, in the long-term, the population tends to decrease the trade flow or income per capita, increasing poverty and reducing production and export levels. Moreover, lower income per capita also decreases import demand.

Cheng and Wall maintain that when models include population, they are usually called augmented gravity models [102]. The basic gravity model can be stretched by the inclusion of import and export countries' populations to analyze the type of impact it has on two-sided trade patterns between two sovereign territories. According to the findings of Matyas, the population tends to raise trade as well as the degree of specialization by multiplying its benefits [103]. However, Dell'Ariccia points out the negative coefficient of the population [104]. Additionally, Bergstrand found the favorable ratio of the GDP per capita resulting from a negative correlation between population and trade patterns, which means that both imports and exports are capital intensive [38]. In the short run, the population affects trade flows favorably by increasing the workforce and specialization, thus providing more exportable goods. In the longer run, however, a larger population is more likely to decrease income per capita, causing a decline in manufacture and exports. Besides, less income per capita reduces the requirement for imports [105]. Nuroglu suggests that the exporting state's population has a favorable effect on bilateral trade patterns, i.e., increased population leads to extensive goods and exports [106].

Furthermore, a more significant number of people could improve the demand for imported commodities. The literature on intra-OIC trade patterns shows various outcomes of population effect on two-sided trade patterns. Some authors support the concept that more per capita brings about higher trade levels [107–109].

We theorize that the resulting poverty from COVID-19 in underdeveloped economies and rising unemployment can ultimately affect the population, as specialization will decrease, GDP will shrink, exchange rates will vary, and intermediate effects, such as lack of access to medical healthcare services, lack of finances and undernourishment will lead to a reduction in population.

3.3. Economic Distance

Trade is more about exploiting the full scale of economies and less a consequence of countries' technological and productive capacity difference [110]. The rise in the export-import quantities is expected to increase trade among states. Trade flows between the countries are more likely to be affected by the economic development of countries. Most of the recent studies used GDP and population as an indicator of nations' economic development. Based on gravity model studies of trade patterns in Baltic countries, Ciptuke found the trading countries' market size to be an important driver of trading patterns [111]. As well as being a variable to impact global trade, the population is also used to evaluate the market volume of a specific country. As pointed out by Binh, Duong, and Cuong, the bigger market means more trade, and therefore, the size of the market is a deciding factor with a positive outcome [112]. The distance coefficient variable has a converse effect. It accounts for the logistics expenditures and time, access to market data, access to a market,

along other proxies preventing nations from engaging in free trade deals [113]. Distance is the only crucial element of trade intensity between two countries of the variables used in the regression and applies to all the goods classifications as well as to the category of total trade. It has been proven that the connection between distance and trade is significant. Per Srivastava and Green, distance makes up about half of the total explained variation in the single product division [114]. Mehl, Schmitz, and Tille maintain that distance is vital for alterations in global trade flows [115]. Additionally, Berman et al. demonstrate that the adverse impact of economic crises on commerce is even more palpable for remote destinations taking more time to ship [116]. Capital underutilization occurs on account of enterprise activity suspension, especially powerplants and manufacture plants closures, raising the price of commodities and international trade costs of import and export by 25% [117]. Accounting for the distance variable, during emergency entailing border closures and travel bans, transport, and transaction costs in foreign trade increase significantly. This inflation is perpetuated by such conditions as reduced operation, inspection, and road closures. Such increase in trade costs was evident in cases of Ebola and SARS virus, where foreign trade expenditures raised by 10%. In the case of the current Coronavirus, they are expected to increase up to a further 25%.

Moreover, Galtsyan and Lane acknowledge that distance helps to explain the flow of adjustment in two-sided portfolio investment positions in the course of the world's financial crisis [118]. The impact of distance is crucial. The outcomes consolidate the significance of economic costs to describe the trade flows.

Zhang et al. applied the gravity model to study the main determinants of global and Asian energy flows. Authors used GDP and population to assess the economic size of trading countries [119]. They found no significant difference between trade flows of the global and Asian energy sectors. This implies that for an energy market, economic size has a greater effect on the demand side. According to Le, the economic distance might be measured by means of the distinction in GDP per capita [120].

3.4. Trade Percentage of GDP

The country's integration in the global economy is illustrated by foreign trade. It is worth stressing that small states are better consolidated into the global economy. The reason is that these countries are specialized in a limited number of sectors, and to satisfy domestic demand, they are involved in more exporting and importing activities than large countries. Thus, it can be concluded that size alone does not determine the level of trade integration. Other factors can be used to explain the role of GDP as a percentage of the trade-in trade flows of the country. These include common past, culture, trading arrangements, economic organization, and presence of multinational organizations. Many scholars, including Brun et al. and Jacks et al. used GDP as a proxy while decomposing trade shifts into the impacts of income variations and trade cost alterations [118,121–123].

Frankel suggests that real GDP is added to represent the factors related to the degree of economic prosperity [124]. Besides, it illustrates the productive power of the exporting state as well as the buying prowess of the importing country. The real GDP coefficient variables tend to have a favorable effect. Based on the gravity model, big economies allocate more funding for both exports and imports. For this reason, the higher the GDP, the more trade for a state [105]. According to the study on bilateral trade by De Groot et al., GDP is positively correlated to trade. Furthermore, a rise in exporter GDP improves bilateral trade by approximately 1.2%, whereas trade is unchangeable in terms of importer GDP. GDP alternation accounts for the deviation in commerce, and this is since almost half of the variances in bilateral trade are accounted for by differences in GDP [125].

When a country has a larger GDP or GNP, the variety of its exported goods will increase accordingly. Additionally, when states share similar GDP or GNP, the trade volume between them will go up. According to Paas, including the scale of the economy and various goods, the size of trade depends considerably on the size of a country's GDP

or GNP [126]. Moreover, the trade-GDP ratio variable illustrates the state's exposure, meaning, the more liberal the country, the higher the volume of its trade [127].

Coronavirus amplified trading costs have a further repercussion for import and export. The increase in export and input costs raises the final products' prices. Furthermore, an increase in expenditure causes a production deficit since policy measures restricting social contact and travel raises additional investment in resources to carry out shipments. Pandemics' stimulated change in market demand shifts from tourism services and leisure towards products requiring a limited social contact. That is to say, the social restrictions diminished the need for traveling and tourism; ergo, certain industries and economies suffered a greater shock than others. Under the COVID-19 market volatility, global GDP falls by 3.9%, and the loss is greater in regions that are highly dependent on trade and tourism. Loss in Cambodia and Thailand is estimated to record 6%, for Singapore, China, and Korea, the loss percentage is 4.5%, while an estimated loss for European Union states reaches 3.4%, 4.6% for Japan, and 3.4% for the USA [17].

3.5. Policy Changes

Our study indicates that political stability has a favorable impact on trade flows. Political stability is a relevant facilitator of international trade. Our study suggests a statistically significant correlation between stability and import, while the correlation between political stability, bilateral trade, and export is negative. Indeed, more politically stable countries are hesitant to sign a trade agreement with other states to increase their amalgamation in the global economy. Political stability impacts the economic potential of the country.

Furthermore, political stability is related to the degree of investment. Foreign investors tend to invest in a politically stable country, as opposed to the ones involved in political tensions and international conflicts. Political stability is the perceived plausibility of the state being either destabilized or overpowered by unconstitutional mingling or too much violence against citizens and their property. De Groot et al. maintain that these elements are crucial in continuing the stability and policy of economic ambiance [125]. However, despite the foreign policy continuous improvement, there are still evident barriers affecting trade prognosis between countries. Several studies show that there is a negative influence of military conflicts on trade flows [128]. Long mentioned that trade volume between countries might decrease due to fear of war, increasing transaction costs, and production costs [129]. On the contrary, an increasing amount of trade impacts by way of decreasing the military conflicts between the countries.

Chen et al. conducted a study on the economic impact of the COVID-19 outbreak on cross-city trade, accounting for overtime variations due to containment measures using an inverted gravity model [130]. They examined impediment measures on trade accounting for incongruity in pandemics severity and incongruous policies varying among Chinese cities. Authors considered fluctuations in the impediment measures as 'COVID shocks' since they allowed to capture changes in pandemics' severity and policy responses among cities. Findings show that the cost of introducing stringent lockdowns in Hubei province would be immense and detrimental for the country's economy, as first-quarter real income would have declined by 47.3%.

3.6. Real Exchange Rate

One more significant variable influencing the level of global trade is the exchange rates [17]. This effect has long been the center of interest for many researchers, who have studied it with two approaches. The first approach suggests that the uncertainty or exchange rate volatility has no impact on commerce, whereas the second approach tries to prove otherwise. Two researchers, Hooper and Kohlhagen, examined the effect of exchange rate incertitude on the size of US-German commerce for the period from 1965 to 1975 and found no correlation in statistical terms [131]. A similar report was presented by Gotur in 1985, when he analyzed the trade volume of the US, France, the UK, Germany, and

Japan. Another study by the IMF (1984) holds a different viewpoint; just because plenty of empirical studies could not find a significant correlation between exchange rate variability and the trade volume does not necessarily discard the idea that such relationship does not exist at all [132]. For instance, in 2002, Hacker and Hatemi analyzed disaggregated bilateral information and found proof of a positive long-term correlation between trade balance and exchange rates.

The real exchange rate shows the consumer's purchasing power, mainly the value they are ready to pay for foreign goods. After the increase in the value of the US dollar in 1980, researchers started to study its impact on trade flows. Some researchers, including Frankel, stated that changes in the volume of trade flows could be partially explained by the changes in the value of the US dollar [133]. Value of currencies and change in the price level makes up a real exchange rate; therefore, real exchange shows the real value consumers can afford when purchasing foreign-produced goods.

4. Discussion

This paper considers the bilateral trade by accounting for the COVID-19 pandemic variable. The ongoing pandemic has, without question, prompted substantial changes in the economic and market landscape throughout the nations and altered the way economies do business. On one side, it intensified the cross-industrial and cross-sectorial cooperation and brought about a technological transformation. On the other hand, it will likely have a negative long-term effect on underdeveloped economies, excluding them further from international trade. In this, we take the pandemics to be a multidimensional macroeconomic shock with a negative effect on bilateral trade, as it consists of technological, policy, and financial aspects. As many nations have implemented emergent changes in the government policies to curb the spread of the virus, including import-export bans, travel restrictions, physical distancing, and complete lockdowns, economies have suffered a major blow, and new clauses on requirements and conditions of international trade were introduced.

Furthermore, a new global market ecosystem, exacerbated by the existing impediments, generated the technological transformation in service delivery, with the latest technological developments having profound implications for national productivity, posing technology shocks that form a major challenge to underdeveloped economies. Finally, macroeconomic downturns manifested in the form of financial shocks posing disruptions in liquidity for most enterprises. Such financial crisis outcomes soon spilled across economies, interfering with cash flow, and crediting for ensuring economic sustainability. The COVID-19-prompted terra incognita introduced various changes of different magnitude in trading, cross-border sales, business communication, and operation; ergo, the impact of the pandemics on the bilateral trade is undeniable.

We argue that the effect of COVID-19 can be adequately assessed solely by accounting for initial market conditions. While the primary, short-term impact on under-developed economies might not be detrimental, the subsequent global market development can have a severe, long-lasting outcome. If an underdeveloped economy was not financially ruined immediately by the crisis, it is further disadvantaged by the inability to keep pace with developing economies' pandemics-stimulated advances.

5. Conclusions

We have undertaken an extensive examination of the gravity model and identified key factors impacting trade during the COVID-19 pandemic. The major contribution of the study is the examination of the financial, political, and technological aspects of pandemics framed as the macroeconomic shock. Recommendations for improving and optimizing bilateral trade are provided and supported by substantial empirical evidence, followed by a description of the exact levels of each variable of the research model.

Our findings suggest that to optimize trade efficiency, state-level policies should be introduced. For instance, the governments can invest in the further development of industry so that they will be able to be supplied by local producers. Likewise, the state may intro-

duce supply initiatives for industrial progress to support infrastructure investment and boost transportation. Due to its importance for oil exports and low production, technical education to enhance the countries' production industry is actively promoted. Similarly, economic diversification will help boost trade flow and further economic negotiations. Another potential method could be to increase the export quality on a par with technical education, which assists in creating novel trade patterns and extending commercial relationships. In the same way, comprehending various opinions of people from both sides helps with mutual understanding.

The impediment is not only related to the distance, but it includes several aspects that should be put into consideration. For instance, the agreements and policies between the two parts, in addition to the economic relation forming the core of international relations, should be considered regarding technological, financial, and policy shocks.

Future research is highly recommended to discover the novel dimensions of the model. How the gravity model will progress in the future depends heavily on whether it can adapt to the ever-changing environment and trade flows and its original analytical approach to the appearing datasets and methodological inventions. Empirical analysis to test the model is also recommended. We urge future studies on the pandemics' influence on bilateral trade to apply the standard gravity equation model treating COVID-19 as an economic shock influencing basic macroeconomic relationships. Researchers should consider such performance measures as unemployment, consumption rates, import and export levels, and inflation. Furthermore, there is bound to be an effect of COVID-19 on supply and demand patterns. The pandemics can be framed either as a technological shock, policy shock, or financial shock. Due to its unpredictable and volatile nature, it caused an economic downturn in export markets, a crash in stock prices, and had an adverse effect on foreign investment.

This paper adds great value to the existing body of knowledge in the field of international trade, crisis management, and sustainability studies in two ways. First, it renders a theoretical ground for explaining the effect of the current crisis on the trading partners and accounts for the spill-over effect of disruptions across trade channels. Second, we point to how estimations on supply and demand downturn can be drawn by treating the outburst as a typical shock to the global trade. In the development of the conceptual model for bilateral trade analysis, we strictly emphasized the COVID-19 variable and interpreted it as a significant macroeconomic shock. To the best of our knowledge, this is the first study to have explored the prospect of regarding pandemics as a multidimensional construct extending beyond the standard supply vs. demand aftereffect debate, as it concurrently causes technological, fiscal, and policy disruptions. Prior approaches focused on the traditional parameterization of bilateral trade determinants and were, therefore, able to capture crisis only to a certain degree, leaving other aspects unaccounted for. Therefore, we suggested future studies should consider integrating it in the modified gravity model to provide solid empirical evidence on the repercussions of ongoing pandemics on bilateral trade. Considering such large-scale disasters as Coronavirus are rare, scholars are not provided with many opportunities to capture and reliably measure economic effects. However, by treating the health crisis as a financial, policy, or technological shock, scholars can by association build on the knowledge on analogous previous disasters, such as the Great Depression, to accommodate the new construct to fit in the standard model that proved efficient and accurate.

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References

1. World Bank. *Global Economic Prospects, June 2020*; World Bank: Washington, DC, USA, 2020.
2. Faulks, B.; Yinghua, S. The COVID 19 Crisis Implications for the Development and Growth of Agricultural Sector in EU countries and Russia. *Int. J. Innov. Econ. Dev.* **2021**, *7*, 37–46. [CrossRef]
3. Obrenovic, B.; Du, J.; Godinic, D.; Tsoy, D.; Khan, M.A.S.; Jakhongirov, I. Sustaining enterprise operations and productivity during the COVID-19 pandemic:"Enterprise Effectiveness and Sustainability Model". *Sustainability* **2020**, *12*, 5981. [CrossRef]
4. Zhan, J.X. Covid-19 and investment–an UNCTAD research round-up of the international pandemic's effect on FDI flows and policy. *Transnatl. Corp.* **2020**, *27*, 1–3. [CrossRef]
5. Guan, W.J.; Ni, Z.Y.; Hu, Y.; Liang, W.H.; Ou, C.Q.; He, J.X.; Zhong, N.S. Clinical characteristics of coronavirus disease 2019 in China. *N. Engl. J. Med.* **2020**, *382*, 1708–1720. [CrossRef] [PubMed]
6. Verschuur, J.; Koks, E.E.; Hall, J.W. Observed impacts of the COVID-19 pandemic on global trade. *Nat. Hum. Behav.* **2021**, *5*, 305–307. [CrossRef] [PubMed]
7. Koks, E.E.; Thissen, M. A multiregional impact assessment model for disaster analysis. *Econ. Syst. Res.* **2016**, *28*, 429–449. [CrossRef]
8. Carrere, C. Revisiting the effects of regional trade agreements on trade flows with proper specification of the gravity model. *Eur. Econ. Rev.* **2006**, *50*, 223–247. [CrossRef]
9. Gupta, R.; Gozgor, G.; Kaya, H.; Demir, E. Effects of geopolitical risks on trade flows: Evidence from the gravity model. *Eurasian Econ. Rev.* **2019**, *9*, 515–530. [CrossRef]
10. Osabuohien, E.S.; Efobi, U.R.; Odebiyi, J.T.; Fayomi, O.O.; Salami, A.O. Bilateral trade performance in West Africa: A gravity model estimation. *Afr. Dev. Rev.* **2019**, *31*, 1–14. [CrossRef]
11. Kepaptsoglou, K.; Karlaftis, M.G.; Tsamboulas, D. The gravity model specification for modeling international trade flows and free trade agreement effects: A 10-year review of empirical studies. *Open Econ. J.* **2010**, *3*, 1–13. [CrossRef]
12. Sohn, C.H. *A Gravity Model Analysis of Korea's Trade Patterns and the Effects of A Regional Trading Arrangement*; Korea Institute for International Economic Policy Working Paper Series; Korea Institute for International Economic Policy: Yeongi-gun, Korea, 2001.
13. Krugman, P. The profession and the crisis. *East. Econ. J.* **2011**, *37*, 307–312. [CrossRef]
14. Dawkins, C.; Srinivasan, T.N.; Whalley, J. Calibration. In *Handbook of Econometrics*; Elsevier: Amsterdam, The Netherlands, 2001; Volume 5, pp. 3653–3703.
15. Heilmann, K. Does political conflict hurt trade? Evidence from consumer boycotts. *J. Int. Econ.* **2016**, *99*, 179–191. [CrossRef]
16. Vitenu-Sackey, P.A.; Barfi, R. The Impact of Covid-19 Pandemic on the Global Economy: Emphasis on Poverty Alleviation and Economic Growth. *Econ. Financ. Lett.* **2021**, *8*, 32–43. [CrossRef]
17. Maliszewska, M.; Mattoo, A.; Van Der Mensbrugghe, D. *The Potential Impact of COVID-19 on GDP and Trade: A Preliminary Assessment*; World Bank Policy Research Working Paper, (9211); World Bank: Washington, DC, USA, 2020.
18. Bonadio, B.; Huo, Z.; Levchenko, A.A.; Pandalai-Nayar, N. *Global Supply Chains in the Pandemic (No. w27224)*; National Bureau of Economic Research: Cambridge, MA, USA, 2020.
19. Eppinger, P.; Felbermayr, G.; Krebs, O.; Kukharskyy, B. *Covid-19 Shocking Global Value Chains*; CESifo Working Paper No. 8572; CESifo Group: Munich, Germany, 2020.
20. Hsu, L.Y.; Chia, P.Y.; Lim, J.F. The Novel Coronavirus (SARS-CoV-2) Pandemic. *Ann. Acad. Med. Singap.* **2020**, *49*, 105–107. [CrossRef]
21. World Bank. *World Bank East Asia and Pacific Economic Update, Spring 2021: Uneven Recovery*; World Bank: Washington, DC, USA, 2021.
22. Sibley, C.G.; Greaves, L.M.; Satherley, N.; Wilson, M.S.; Overall, N.C.; Lee, C.H.; Barlow, F.K. Effects of the COVID-19 pandemic and nationwide lockdown on trust, attitudes toward government, and well-being. *Am. Psychol.* **2020**. [CrossRef]
23. Khan, K.I.; Niazi, A.; Nasir, A.; Hussain, M.; Khan, M.I. The Effect of COVID-19 on the Hospitality Industry: The Implication for Open Innovation. *J. Open Innov. Technol. Mark. Complex.* **2021**, *7*, 30. [CrossRef]
24. Melitz, M.J.; Ottaviano, G.I. Market size, trade, and productivity. *Rev. Econ. Stud.* **2008**, *75*, 295–316. [CrossRef]
25. Bernard, A.B.; Jensen, J.B.; Redding, S.J.; Schott, P.K. The margins of US trade. *Am. Econ. Rev.* **2009**, *99*, 487–493. [CrossRef]
26. McCallum, J. *National Borders Matter: Canada-U.S. Regional Trade Patterns*; The American Economic Review; American Economic Association: Nashville, TN, USA, 1995; Volume 85, pp. 615–623.
27. Anderson, J.E.; Larch, M.; Yotov, Y.V. *Trade and Investment in the Global Economy (No. w23757)*; National Bureau of Economic Research: Cambridge, MA, USA, 2017.
28. Yotov, Y.V.; Piermartini, R.; Monteiro, J.A.; Larch, M. *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model*; World Trade Organization: Geneva, Switzerland, 2016.
29. Fajgelbaumy, P.; Grossman, G.M.; Helpman, E. *Income Distribution, Product Quality, and International Trade*; The World Bank: Washington, DC, USA, 2011.
30. Bernhofen, D.M.; Helpman, E. *Understanding Global Trade*; Harvard University Press: Cambridge, MA, USA, 2011; pp. 111–114.
31. Van Bergeijk, P.A.G.; Brakman, S. *The Gravity Model in International Trade: Advances and Applications*; Van Bergeijk, P.A.G., Brakman, S., Eds.; Cambridge University Press: Cambridge, UK, 2010.

32. Pöyhönen, P. A tentative model for the volume of trade between countries. *Weltwirtschaftliches Arch.* **1963**, *90*, 93–100.
33. Pulliainen, K. A World Trade Study: An Econometric Model of the Pattern of Commodity Flows in International Trade. *Ekon. Samfundets Tidskrift* **1963**, *16*, 69–77.
34. Linnemann, H. *An Econometric Study of International Trade Flows (No. 42)*; North-Holland Pub. Co.: Amsterdam, The Netherlands, 1966; Volume xiii, p. 234.
35. Armington, P.S. A theory of demand for products distinguished by place of production. *Staff Pap.* **1969**, *16*, 159–178. [CrossRef]
36. Bergstrand, J.H. The Heckscher-Ohlin-Samuelson model, the Linder hypothesis and the determinants of bilateral intra-industry trade. *Econ. J.* **1990**, *100*, 1216–1229. [CrossRef]
37. Bergstrand, J.H. The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence. *Rev. Econ. Stat.* **1985**, *67*, 474–481. [CrossRef]
38. Bergstrand, J.H. The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade. *Rev. Econ. Stat.* **1989**, *71*, 143–153. [CrossRef]
39. Brakman, S.; Garretsen, H.; Van Marrewijk, C. *The New Introduction to Geographical Economics*; Cambridge University Press: Cambridge, UK, 2009.
40. Helpman, E.; Krugman, P.R. *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy*; MIT Press: Cambridge, MA, USA, 1985.
41. Krugman, P.; Obstfeld, M. *International Economy*; Publications Kritiki: Athens, Greece, 2002.
42. Helpman, E. A simple theory of international trade with multinational corporations. *J. Political Econ.* **1984**, *92*, 451–571. [CrossRef]
43. Helpman, E.; Melitz, M.Y. Rubinstein "Trading Partners and Trading Volume". *Q. J. Econ.* **2008**, *123*, 441–487. [CrossRef]
44. Ethridge, D. *Research Methodology in Applied Economics: Organizing, Planning, and Conducting Economic Research*; Blackwell Publishing: Hoboken, NJ, USA, 2004.
45. Babbie, E. *The Practice of Social Research*, 11th ed.; Thomson Wadsworth: Belmont, CA, USA, 2007; Volume 24, p. 66.
46. Ekanayake, E.M.; Mukherjee, A.; Veeramacheneni, B. Trade blocks and the gravity model: A study of economic integration among Asian developing countries. *J. Econ. Integr.* **2010**, *25*, 627–643. [CrossRef]
47. Brinca, P.; Duarte, J.B.; Faria-e-Castro, M. Is the COVID-19 Pandemic a Supply or a Demand Shock? *Econ. Synop.* **2020**, *31*. [CrossRef]
48. Guerrieri, V.; Lorenzoni, G.; Straub, L.; Werning, I. *Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages?* National Bureau of Economic Research: Cambridge, UK, 2020.
49. Baqaee, D.; Farhi, E. *Keynesian Production Networks and the Covid-19 Crisis: A Simple Benchmark (No. w28346)*; National Bureau of Economic Research: Cambridge, MA, USA, 2021.
50. Cochrane, J.H. Coronavirus monetary policy. In *Economics in the Time of COVID-19*; Baldwin, R., Weder di Mauro, B., Eds.; CEPR Press: London, UK, 2020.
51. Triggs, A.; Kharas, H. *The Triple Economic Shock of COVID-19 and Priorities for an Emergency G-20 Leaders Meeting*; Brookings: Washington, DC, USA, 2020.
52. Hassan, T.A.; Hollander, S.; van Lent, L.; Tahoun, A. *Firm-Level Exposure to Epidemic Diseases: Covid-19, SARS, and H1N1 (No. w26918)*; National Bureau of Economic Research: Cambridge, MA, USA, 2020.
53. Bartik, A.W.; Bertrand, M.; Cullen, Z.; Glaeser, E.L.; Luca, M.; Stanton, C. The impact of COVID-19 on small business outcomes and expectations. *Proc. Natl. Acad. Sci. USA* **2020**, *117*, 17656–17666. [CrossRef]
54. Baker, S.R.; Farrokhnia, R.A.; Meyer, S.; Pagel, M.; Yannelis, C. How does household spending respond to an epidemic? Consumption during the 2020 COVID-19 pandemic. *Rev. Asset Pricing Stud.* **2020**, *10*, 834–862. [CrossRef]
55. Hacioglu, S.; Känzig, D.R.; Surico, P. *Consumption in the Time of Covid-19: Evidence from UK Transaction Data, CEPR*; Discussion Papers14733, C.E.P.R. Discussion Papers; Centre for Economic Policy Research: London, UK, 2020.
56. Chen, H.; Qian, W.; Wen, Q. The Impact of the COVID-19 Pandemic on Consumption: Learning from High Frequency Transaction Data. Available online: https://bfi.uchicago.edu/wp-content/uploads/Qian_COVID-Consumption-200414.pdf (accessed on 4 May 2021).
57. Sobirova, Z. Hoarding and Opportunistic Behavior During Covid-19 Pandemics: A Conceptual Model of Non-Ethical Behavior. *Int. J. Manag. Sci. Bus. Adm.* **2020**, *6*, 22–29. [CrossRef]
58. Svajdova, L. Consumer Behaviour during Pandemic of COVID-19. *J. Int. Bus. Res. Mark.* **2021**, *6*, 34–37.
59. Meyer, B.H.; Prescott, B.; Sheng, X.S. The impact of the COVID-19 pandemic on business expectations. *Int. J. Forecast.* **2021**. [CrossRef]
60. Candia, B.; Coibion, O.; Gorodnichenko, Y. *Communication and the Beliefs of Economic Agents*; National Bureau of Economic Research: Cambridge, MA, USA, 2020.
61. Goolsbee, A.; Chad, S. Fear, Lockdown, and Diversion: Comparing Drivers of Pandemic Economic Decline 2020. *J. Public Econ.* **2021**, *193*, 104311. [CrossRef]
62. Sheth, J. Impact of Covid-19 on Consumer Behavior: Will the Old Habits Return or Die? *J. Bus. Res.* **2020**, *117*, 280–283. [CrossRef]
63. Avdiu, B.; Nayyar, G. When Face-to-Face Interactions Become an Occupational Hazard Jobs in the Time of COVID-19. Available online: https://openknowledge.worldbank.org/bitstream/handle/10986/33752/When-Face-to-Face-InteractionsBecome-an-Occupational-Hazard-Jobs-in-the-Time-of-COVID-19.pdf?sequence=1 (accessed on 2 September 2020).

64. Long, N.N.; Khoi, B.H. An Empirical Study about the Intention to Hoard Food during COVID-19 Pandemic. *EURASIA. J. Math. Sci. Technol. Educ.* **2020**, *16*, em1857.
65. Scherer, A.G.; Palazzo, G. The New Political Role of Business in a Globalized World: A Review of a New Perspective on CSR and Its Implications for the Firm, Governance, and Democracy. *J. Manag. Stud.* **2011**, *48*, 899–931. [CrossRef]
66. Calton, J.M.; Werhane, P.H.; Hartman, L.P.; Bevan, D. Building partnerships to create social and economic value at the base of the global development pyramid. *J. Bus. Ethics* **2013**, *117*, 721–733. [CrossRef]
67. Ezeibe, C.C.; Ilo, C.; Ezeibe, E.N.; Oguonu, C.N.; Nwankwo, N.A.; Ajaero, C.K.; Osadebe, N. Political distrust and the spread of COVID-19 in Nigeria. *Glob. Public Health* **2020**, *15*, 1753–1766. [CrossRef]
68. Makin, A.J.; Layton, A. The global fiscal response to COVID-19: Risks and repercussions. *Econ. Anal. Policy* **2021**, *69*, 340–349. [CrossRef]
69. Julien, C.; Nilanjan, B. Global Health Law & Governance Amidst the Pandemic: Evidence, Lessons, and Reforms. 2020; pp. 207–269. Available online: https://www.annalsofhealthlaw.com/annalsofhealthlaw/Store.action (accessed on 4 May 2021).
70. Ranjan, P.; Anand, P. COVID-19, India, and Investor-State Dispute Settlement (ISDS): Will India Be Able to Defend Its Public Health. *Asia Pac. Law Rev.* **2020**, *28*, 2020. [CrossRef]
71. Chaisse, J. Both Possible and Improbable-Could COVID-19 Measures Give Rise to Investor-State Disputes? *Contemp. Asia Arb. J.* **2020**, *13*, 99.
72. Makin, A.J. The Keynesian Revival. In *The Limits of Fiscal Policy*; Palgrave Pivot: Cham, Switzerland, 2018; pp. 1–14.
73. Makin, A.J. Lessons for macroeconomic policy from the Global Financial Crisis. *Econ. Anal. Policy* **2019**, *64*, 13–25. [CrossRef]
74. Romer, C.D. The Fiscal Policy Response to the Pandemic. Available online: https://www.brookings.edu/wp-content/uploads/2021/03/BPEASP21_Romer_conf-draft_updated.pdf (accessed on 4 May 2021).
75. Ma, Z.; Cheng, L. The effects of financial crises on international trade. In *International Trade in East Asia*; University of Chicago Press: Chicago, IL, USA, 2005; pp. 253–286.
76. Panda, R.; Sethi, M.; Kumaran, M. A study of bilateral trade flows of China and India. *Indian J. Sci. Technol.* **2016**, *9*, 1–7. [CrossRef]
77. How COVID-19 has Pushed Companies Over the Technology Tipping Point—And Transformed Business Forever. McKinsey & Company (October, 2020). Available online: https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever (accessed on 4 May 2021).
78. Elsersy, M.; Sherif, A.; Darwsih, A.; Hassanien, A.E. Digital Transformation and Emerging Technologies for Tackling COVID-19 Pandemic. In *Digital Transformation and Emerging Technologies for Fighting COVID-19 Pandemic: Innovative Approaches*; Springer: Berlin/Heidelberg, Germany, 2021; pp. 3–19.
79. Jamal, T.; Budke, C. Tourism in a world with pandemics: Local-global responsibility and action. *J. Tour. Futures* **2020**, *6*, 181–188, in press. [CrossRef]
80. Ntasis, L.; Koronios, K.; Pappas, T. The impact of COVID-19 on the technology sector: The case of TATA Consultancy Services. *Serv. Strateg. Chang.* **2021**, *30*, 137–144. [CrossRef]
81. Amekudzi-Kennedy, A.; Labi, S.; Woodall, B.; Marsden, G.; Grubert, E. Role of Socially-Equitable Economic Development in Creating Resilient and Sustainable Systems: COVID-19-Related Reflections. *Preprints* **2020**, 2020040336. [CrossRef]
82. Agostino, D.; Arnaboldi, M.; Lema, M.D. New development: COVID-19 as an accelerator of digital transformation in public service delivery. *Public Money Manag.* **2021**, *41*, 69–72. [CrossRef]
83. Argüelles, A.J.; Cortés, H.D.; Ramirez, O.E.P.; Bustamante, O.A. Technological Spotlights of Digital Transformation: Uses and Implications Under COVID-19 Conditions. In *Information Technology Trends for a Global and Interdisciplinary Research Community*; IGI Global: Hershey, PA, USA, 2021; pp. 19–49.
84. Bin, E.; Andruetto, C.; Susilo, Y.; Pernestål, A. The trade-off behaviours between virtual and physical activities during the first wave of the COVID-19 pandemic period. *Eur. Transp. Res. Rev.* **2021**, *13*, 1–19. [CrossRef]
85. Ranilović, N. The effects of economic integration on Croatian merchandise trade: A gravity model study. *Comp. Econ. Stud.* **2017**, *59*, 382–404. [CrossRef]
86. Komorovska, J.; Kuiper, M.; van Tongeren, F. *Sharing Gravity: Gravity Estimates of Trade Shares in Agri-Food*; Working Paper; OECD: Paris, France, 2007.
87. Filippini, C.; Molini, V. The determinants of East Asian trade flows: A gravity equation approach. *J. Asian Econ.* **2003**, *14*, 695–711. [CrossRef]
88. Adler-Milstein, J. From digitization to digital transformation: Policy priorities for closing the gap. *JAMA* **2021**, *325*, 717–718. [CrossRef]
89. Chakravorti, B.; Chaturvedi, R.S. Which Countries Were (And Weren't) Ready for Remote Work? Available online: https://hbr.org/2020/04/which-countries-were-and-werent-ready-for-remote-work (accessed on 4 May 2021).
90. Bhat, M.A.; Khan, S.T.; Rainayee, R.A. Assessment of Perceived Labor Market Conditions in Employees' Turnover Intention Model–Mediation and Moderation Analyzes. *PSU Res. Rev.* **2021**, *5*. [CrossRef]
91. Rojas, F.L.; Jiang, X.; Montenovo, L.; Simon, K.I.; Weinberg, B.A.; Wing, C. *Is the Cure Worse than the Problem Itself? Immediate Labor Market Effects of COVID-19 Case Rates and School Closures in the US (No. w27127)*; National Bureau of Economic Research: Cambridge, MA, USA, 2020.

92. Gupta, S.; Montenovo, L.; Nguyen, T.D.; Lozano-Rojas, F.; Schmutte, I.M.; Simon, K.I.; Weinberg, B.A.; Wing, C. *Effects of Social Distancing Policy on Labor Market Outcomes (w27280)*; National Bureau of Economic Research: Cambridge, MA, USA, 2020.
93. BDI. Export Controls and Export Bans over the Course of the Covid-19 Pandemic. Available online: https://english.bdi.eu/%20publication/news/export-controls-and-export-bans-over-the-courseof-the-covid-19-pandemic/ (accessed on 29 April 2020).
94. Espitia, A.; Rocha, N.; Ruta, M. *Covid-19 and Food Protectionism: The Impact of the Pandemic and Export Restrictions on World Food Markets*; The World Bank: Washington, DC, USA, 2020.
95. Dunford, D.; Dale, B.; Stylianou, N.; Lowther, E.; Ahmed, M.; de la Torre Arenas, I. The World in Lockdown in Maps and Charts. Retrieved December 01, 2020, from BBC News. Available online: https://www.bbc.com/news/world-52103747 (accessed on 4 May 2021).
96. Eichenbaum, M.S.; Rebelo, S.; Trabandt, M. *The Macroeconomics of Epidemics (No. w26882)*; National Bureau of Economic Research: Cambridge, MA, USA, 2020.
97. Aum, S.; Lee, S.Y.T.; Shin, Y. Covid-19 doesn't need lockdowns to destroy jobs: The effect of local outbreaks in korea. *Labour Econ.* **2021**, *70*, 101993. [CrossRef]
98. Sabat, I.; Neuman-Böhme, S.; Varghese, N.E.; Barros, P.P.; Brouwer, W.; van Exel, J.; Schreyögg, J.; Stargardt, T. United but divided: Policy responses and people's perceptions in the EU during the COVID-19 outbreak. *Health Policy* **2020**, *124*, 909–918. [CrossRef]
99. Akter, S.; Ashrafi, T.; Waligo, V. Changes in Consumer Purchasing Behavior Due to COVID-19 Pandemic. *Changes* **2021**, *77*. [CrossRef]
100. Coibion, O.; Gorodnichenko, Y.; Weber, M. *The Cost of the Covid-19 Crisis: Lockdowns, Macroeconomic Expectations, and Consumer Spending (No. w27141)*; National Bureau of Economic Research: Cambridge, MA, USA, 2020.
101. Andersen, A.L.; Hansen, E.T.; Johannesen, N.; Sheridan, A. Pandemic, Shutdown and Consumer Spending: Lessons from Scandinavian Policy Responses to COVID-19. *arXiv* **2020**, arXiv:2005.04630.
102. Cheng, I.-H.; Wall, H.J. Controlling for heterogeneity in gravity models of trade and integration. *Rev. Fed. Reserve Bank St. Louis* **2005**, *87*, 49–63. [CrossRef]
103. Mátyás, L. Proper econometric specification of the gravity model. *World Econ.* **1997**, *20*, 363–368. [CrossRef]
104. Dell'Ariccia, G. Exchange rate fluctuations and trade flows: Evidence from the European Union. *Imf Staff Pap.* **1999**, *46*, 315–334. [CrossRef]
105. Nuroglu, E. The Impact of Population on Bilateral Trade Flows in the Case of OIC. Available online: https://www.researchgate.net/publication/261000595_The_Impact_of_Population_on_Bilateral_Trade_Flows_in_the_case_of_OIC (accessed on 4 May 2021).
106. Nuroglu, E. Three Essays on Analyzing Bilateral Trade Flows. Ph.D. Thesis, University of Vienna, Wien, Austria, 2010.
107. Abd Karim, M.Z.; Chan, S.G.; Hassan, S. Bank efficiency and non-performing loans: Evidence from Malaysia and Singapore. *Prague Econ. Papers* **2010**, *2*, 118–132. [CrossRef]
108. Hassan, M.U.; Ali, N. Potential for blue-gray water trade-offs for irrigation in small towns of Pakistan: A case study of farmers' costs and benefits in Haroonabad. *Pak. Dev. Rev.* **2002**, *41*, 161–177. [CrossRef]
109. Mehanna, R.A. International trade, religion, and political freedom: An empirical investigation. *Glob. Bus. Econ. Rev.* **2003**, *5*, 284–296. [CrossRef]
110. Krugman, P. Scale Economies, Product Differentiation, and the Pattern of Trade. *Am. Econ. Rev.* **1980**, *70*, 950–959.
111. Čipkutė, E. The gravity model for assessing trade patterns: The case of Baltic states. *Ekonomika* **2016**, *95*, 81–97. [CrossRef]
112. Binh, D.T.T.; Duong, N.V.; Cuong, H.M. Applying Gravity Model to Analyze trade Activities of Vietnam. Available online: https://www.freit.org/WorkingPapers/Papers/TradePatterns/FREIT639.pdf (accessed on 4 May 2021).
113. Márquez-Ramos, L.; Martínez-Zarzoso, I.; Suárez-Burguet, C. The role of distance in gravity regressions: Is there really a missing globalisation puzzle? *Top. Econ. Anal. Policy* **2007**, *7*. [CrossRef]
114. Srivastava, R.K.; Green, R.T. Determinants of bilateral trade flows. *J. Bus.* **1986**, *59*, 623–640. [CrossRef]
115. Mehl, A.; Schmitz, M.; Tille, C. *Distance(s) and the volatility of international trade(s)*; Kiel Institute for the World Economy (IfW): Kiel, Germany, 2019.
116. Berman, E.; Felter, J.H.; Shapiro, J.N.; Troland, E. Modest, secure, and informed: Successful development in conflict zones. *Am. Econ. Rev.* **2013**, *103*, 512–517. [CrossRef]
117. Vidya, C.T.; Prabheesh, K.P. Implications of COVID-19 pandemic on the global trade networks. *Emerg. Mark. Financ. Trade* **2020**, *56*, 2408–2421. [CrossRef]
118. Galstyan, V.; Lane, P.R. Bilateral portfolio dynamics during the global financial crisis. *Eur. Econ. Rev.* **2013**, *57*, 63–74. [CrossRef]
119. Zhang, H.; Xi, W.; Ji, Q.; Zhang, Q. Exploring the driving factors of global LNG trade flows using gravity modelling. *J. Clean. Prod.* **2018**, *172*, 508–515. [CrossRef]
120. Le, T.-H. Does economic distance affect the flows of trade and foreign direct investment? Evidence from Vietnam. *Cogent Econ. Financ.* **2017**, *5*. [CrossRef]
121. Brun, J.F.; Carrère, C.; Guillaumont, P.; De Melo, J. Has distance died? Evidence from a panel gravity model. *World Bank Econ. Rev.* **2005**, *19*, 99–120. [CrossRef]
122. Jacks, D.S.; Meissner, C.M.; Novy, D. Trade Costs, 1870–2000. *Am. Econ. Rev.* **2008**, *98*, 529–534. [CrossRef]
123. De Benedictis, L.; Taglioni, D. The gravity model in international trade. In *The Trade Impact of European Union Preferential Policies*; Springer: Berlin/Heidelberg, Germany, 2011; pp. 55–89.

124. Frankel, J.A.; Stein, E.; Wei, S.J. *Continental Trading Blocs: Are They Natural, or Super-Natural? (No. w4588)*; National Bureau of Economic Research: Cambridge, MA, USA, 1993.
125. De Groot, H.L.; Linders, G.J.; Rietveld, P.; Subramanian, U. The institutional determinants of bilateral trade patterns. *Kyklos* **2004**, *57*, 103–123. [CrossRef]
126. Paas, T. *Gravity Approach For Modeling Trade Flows Between Estonia And The Main Trading Partners*; Faculty of Economics and Business Administration, University of Tartu: Tartu, Estonia, 2000.
127. Rahman, M.M. Australia's global trade potential: Evidence from the gravity model analysis. In Proceedings of the 2009 Oxford Business and Economics Conference (OBEC 2009), Oxford, UK, 24–26 June 2009; Oxford University Press: Oxford, UK, 2009; pp. 1–41.
128. Brown, E. Nicaragua: Sandinistas, social transformation and the continuing search for a popular economic programme. *Geoforum* **1996**, *27*, 275–295. [CrossRef]
129. Long, A. *Deterrenceâ€". From Cold War to Long War: Lessons from Six Decades of RAND Research*; Rand Corporation: Santa Monica, CA, USA, 2008.
130. Chen, N.; Zhou, M.; Dong, X.; Qu, J.; Gong, F.; Han, Y.; Zhang, L. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. *Lancet* **2020**, *395*, 507–513. [CrossRef]
131. Hooper, P.; Kohlhagen, S.W. The effect of exchange rate uncertainty on the prices and volume of international trade. *J. Int. Econ.* **1978**, *8*, 483–511. [CrossRef]
132. Pissulla, P. The IMF and the countries of Eastern Europe. *Intereconomics* **1984**, *19*, 65–70. [CrossRef]
133. Frankel, J.M.; Riley, T.W. *Comparison Testing to Improve Tillage Efficiency*; Dept. of Resources and Energy: Canberra, Australia, 1997.