

Impact of Government Response to COVID19 on the Role of GVC and Transportation

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Role of GVC and Transportation in COVID19

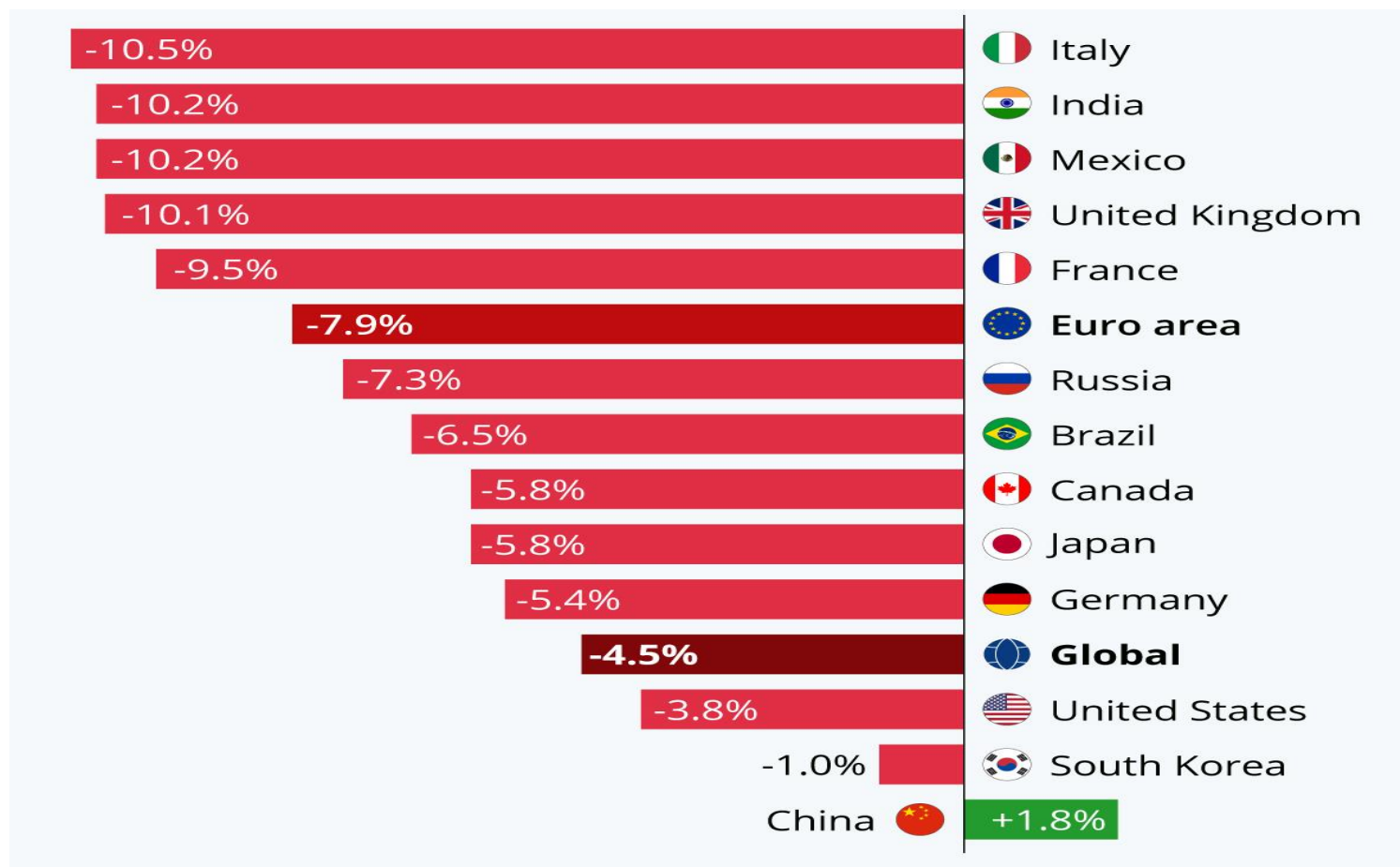
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How COVID19 Disrupts Worldwide GVC and Transportation

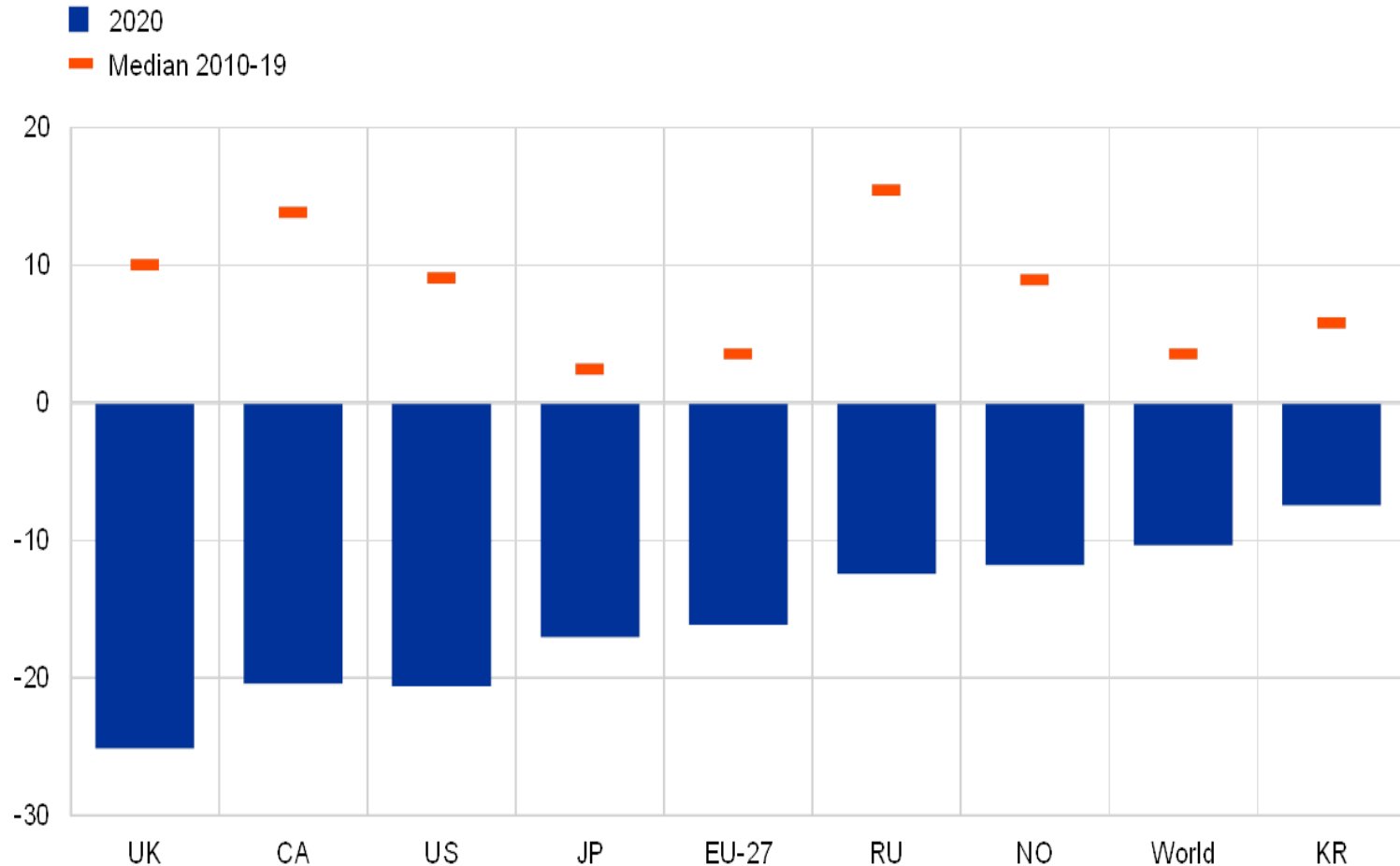
GDP Growth during COVID19

Source : OECD (2021), Statista (2021)



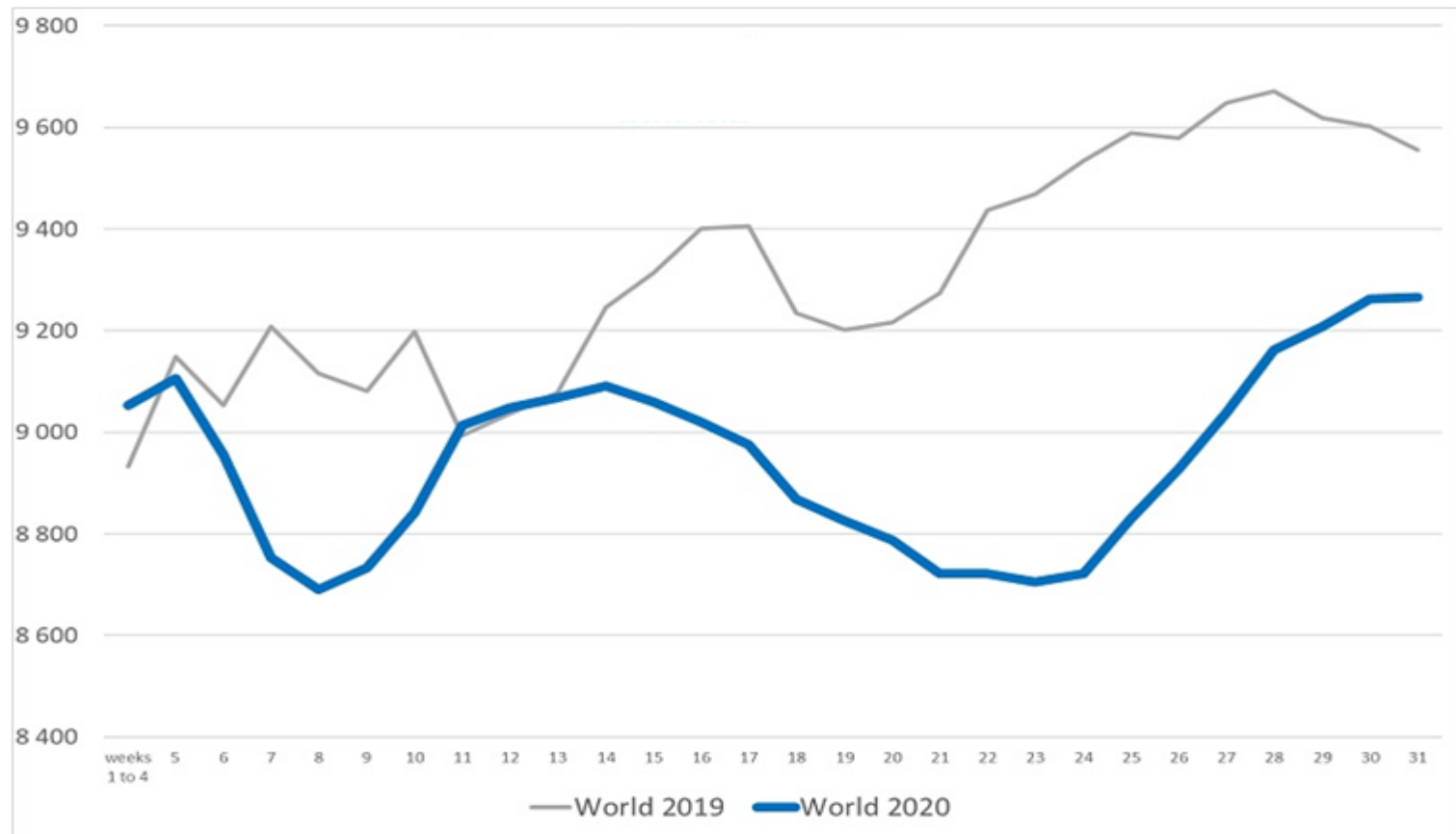
Chinese Exports of Intermediate Goods

Source : ECB (2021)



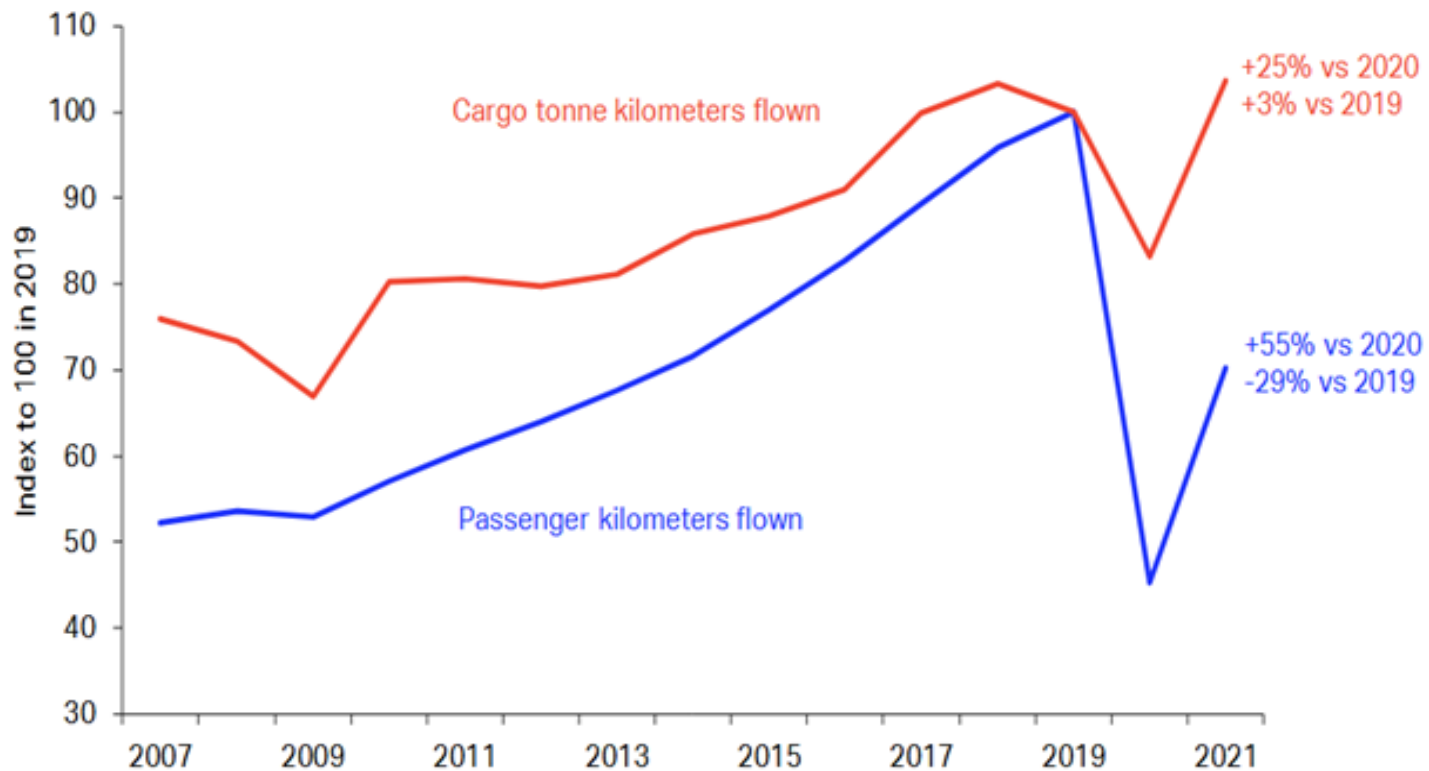
Worldwide Arrivals of Container Ship

Source : UNCTAD (2021)



Air Passenger and Cargo Flow

Source : IATA (2021)

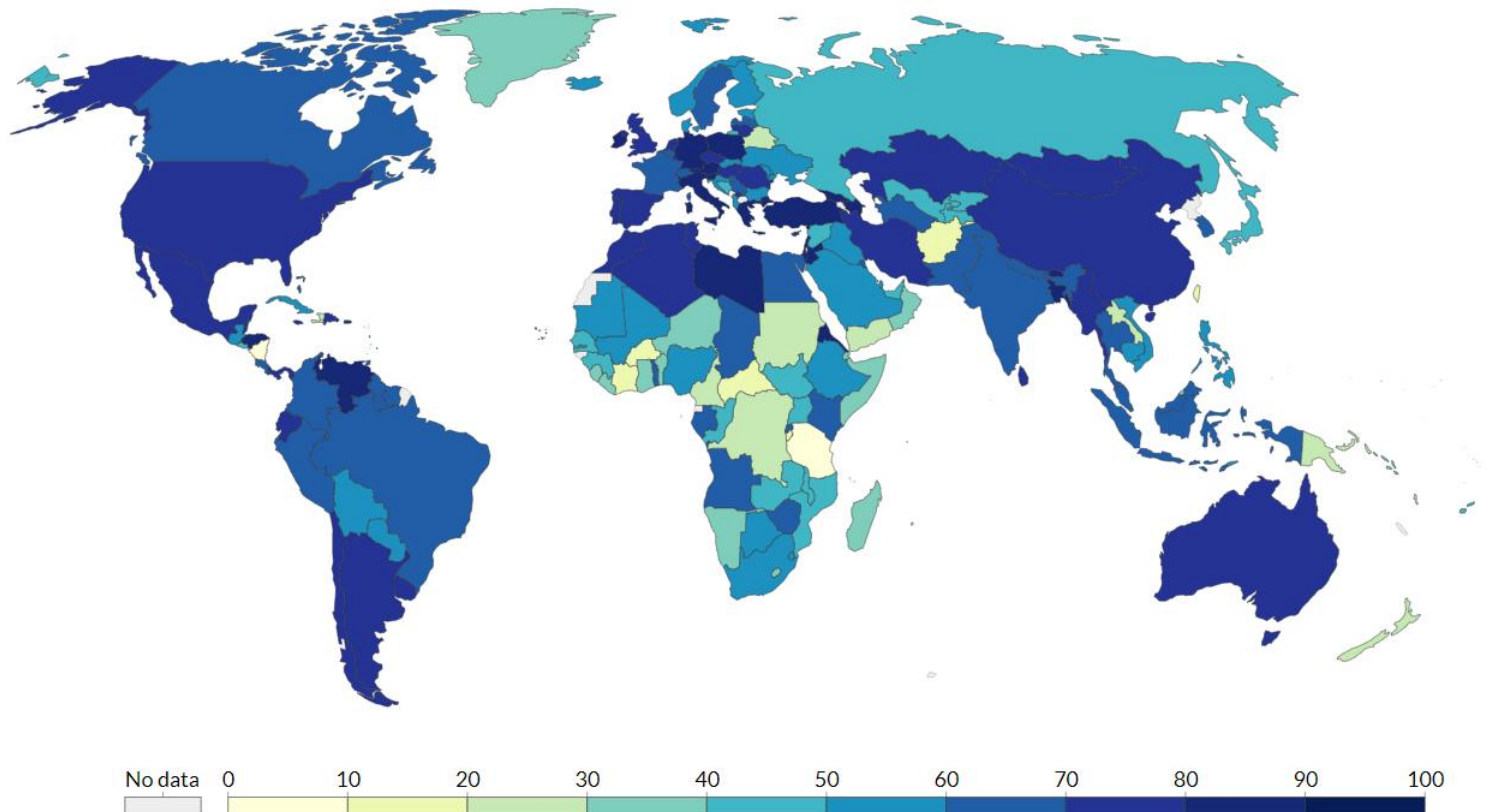


How Governments Respond to COVID19

Government Stringency to COVID19 (Map)

Source : Our World in Data (2021)

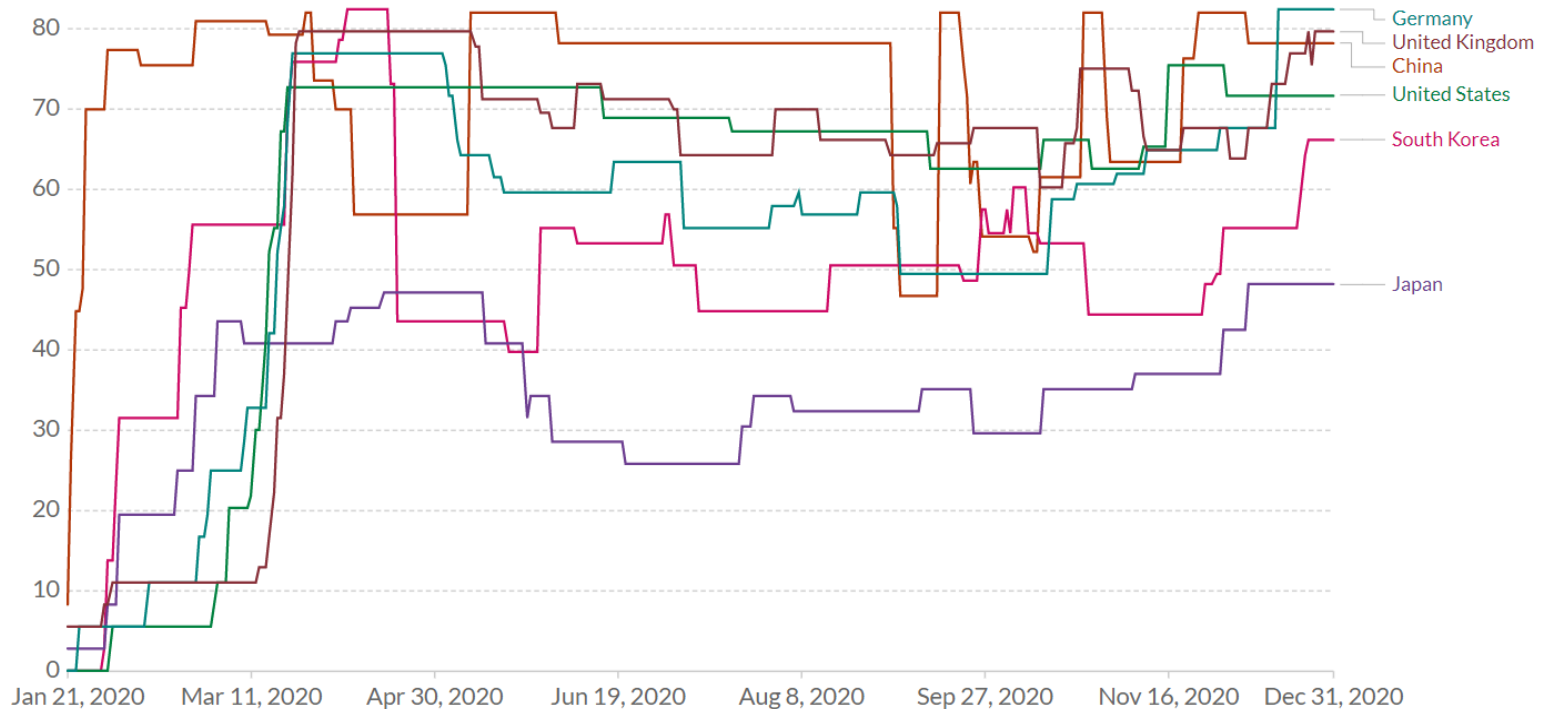
COVID-19: Stringency Index, Dec 31, 2020



Government Stringency to COVID19 (Chart)

Source : Our World in Data (2021)

COVID-19: Stringency Index



GVC and Transportation in COVID19

Changing Paradigm of GVC

Higher GVC participation of small open countries

Important role of emerging economies in GVC

COVID19 is changing the traditional GVC paradigm

- Risk of GVC with concentrated and rigid structures in COVID19
- Challenge of GVC to manage various vendors in COVID19
- Collapse of 2nd and 3rd vendors in COVID19
- Restricting exports of medical supplies in COVID19

Forward, backward, lengthy, lack of diversity

Changing Paradigm of Transportation

Economy of scale in logistics industry

important subject in academic and industrial territories

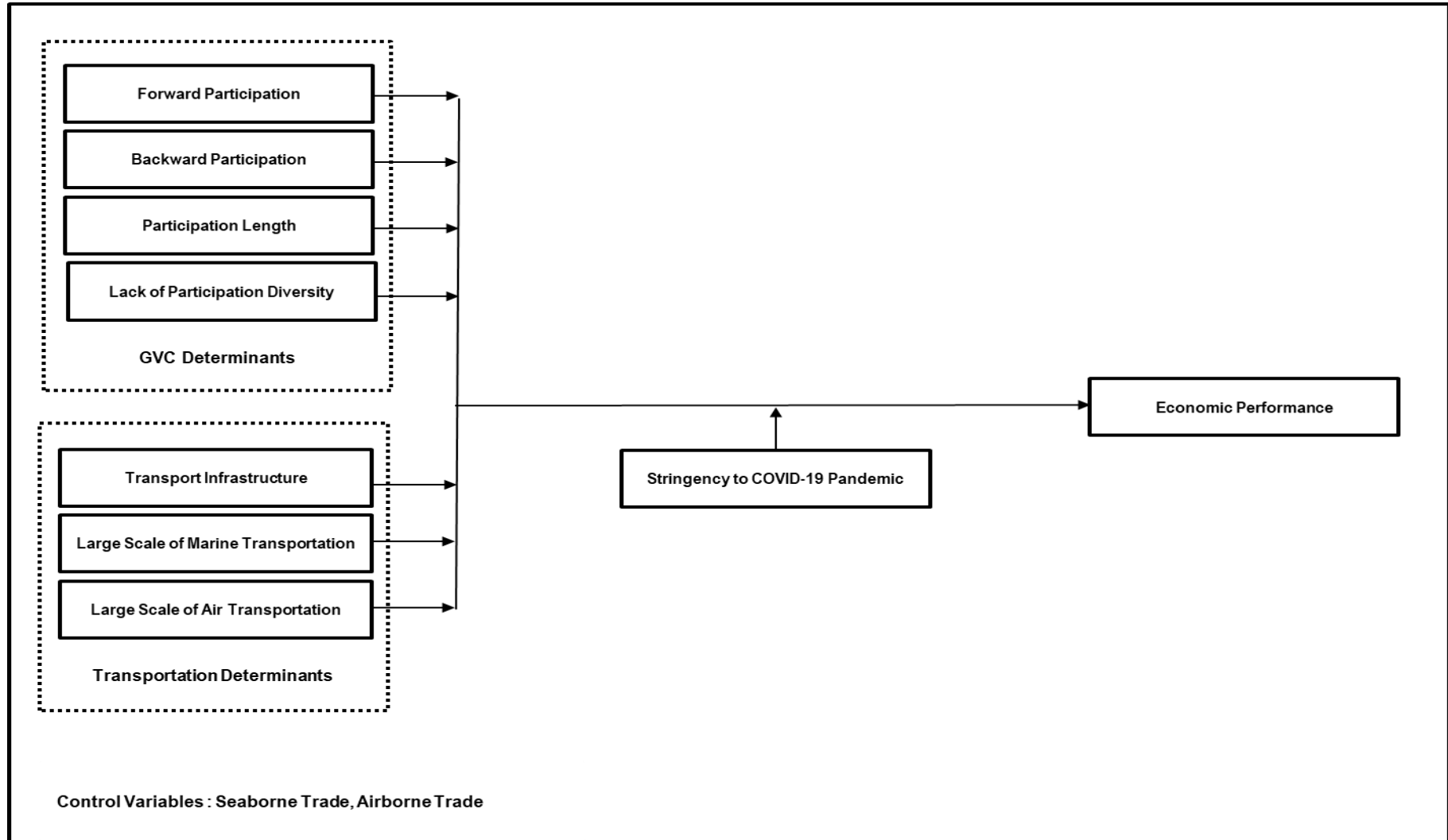
Size of ship and aircraft to enhance performance

- Size matter is a double-edged sword

- Negative aspects behind the economy of scale

Infrastructure and large scale of transportations

Role of GVC and Transportation in COVID19



GVC and Enhancing Performance

GVC Forward Participation and Performance

Ratio of domestic value added sent to third economies

Seller perspective, supply side in GVC (Kowalski et al., 2015)

Positive aspects of forward participation (Korwatanasakul et al., 2020; Urata and Baek, 2019; Kummritz, 2016; Tsakanikas et al., 2020)

High forward participation, high level of industrialization

Forward participation not always positive (Díaz-Mora et al., 2018)

H1: Forward participation / Economic performance (+)

GVC Backward Participation and Performance

Economy importing intermediates to produce its exports

Buyer perspective, sourcing side in GVC (Kowalski et al., 2015)

Positive aspects of forward participation (Yanikkaya and Altun, 2020; Jona-Lasinio and Meliciani, 2019; Kummritz, 2016; Tsakanikas et al., 2020)

Backward participation not always positive (Hollweg, 2019)

High backward participation, low level of industrialization

H2: Backward participation / Economic performance (+)

GVC Participation Lengthy and Performance

Due to COVID19, minimizing risk not maximizing efficiency
Emphasizing shorten and broadened GVC since COVID19
Companies participating in long can be at high risk
Lengthy of participation becomes an opportunism–
enhancing influence (Ayadi et al., 2020; Noordewier et al., 1990)

H3: Participation lengthy / Economic performance (–)

Lack of Participation Diversity and Performance

international trade with GVC disrupted during COVID19

Operational and disruption risks involved in GVC

Highly clustered GVC and three hubs US, China, Germany

China, a hub of supply and demand in traditional trade and

GVC (Li et al., 2019; Kowalski et al., 2015; Baldwin and Lopez-Gonzalez, 2013)

H4: Lack of diversity / Economic performance (–)

Transportation and Enhancing Performance

Transport Infrastructure and Performance

Infrastructure investments enhance productivity

Increase efficiency and enhance reliability or service quality with the investment into infrastructures

Advanced infrastructure makes transportation cost and transit time lower (Mačiulis et al., 2009)

H5: Transport infrastructure / Economic performance (+)

Large Scale of Marine Transportation and Performance

Limitation of container ship size

Negative cost efficiency

Negative effects regarding fares Index

Lower customer service

H6: Larger marine transportation / Economic performance (–)

Large Scale of Air Transportation and Performance

Size matter for air transportation

B747 (Boeing), A380 (Airbus) have driven the aircraft size

Crisis of A380: Stop producing A380 from 2021

Heavy burden for fuel cost inefficiency of large aircrafts

Air cargo growth has also been slowing

H7: Larger air transportation / Economic performance (–)

GVC, Transportation, Performance in COVID19

GVC, transportation can be sensitive to the country policy

Quality of institutions is strongly associated with GVC and transportation activities (Twinn et al., 2020; Kowalski et al., 2015)

Government stringent restrictions over private areas have many negative effects on exchanges, interactions

H8, 9, 10, 11: Moderating effects of government stringency to GVC activities / Economic performance (-)

H12, 13, 14: Moderating effects of government stringency to transportation activities / Economic performance (-)

Research Method

Data collection

- 828 observations from 138 countries based on 6–year data
- Data collected from secondary sources
- World Bank, UNCTAD, OECD, Trend Economy, Our World in Data

Statistical test

- Panel data with five observations for each country
- Regression model with robust standard error by using two–way clustering procedure

Result of Panel Analysis

	Model 1	Model 2	Model 3	Model 4
Constant	0.094	-0.382	0.263***	0.109
Seaborne trade	0.509***	0.379***	0.652***	0.367***
Airborne trade	0.035***	0.045***	0.204***	0.451***
Forward participation		0.604**		0.391**
Backward participation		0.109**		0.077**
Participation lengthy		0.778**		0.232
Lack of participation diversity		0.039		0.038
Transport infrastructure			0.181***	0.106**
Large scale of marine transportation			-0.344***	-0.267***
Large scale of air transportation			-0.206***	-0.469***
R square	0.658	0.556	0.769	0.806

Moderating Effect of Stringency to COVID19

	Stricter Response	Less Strict Response
Seaborne trade	0.492***	0.516***
Airborne trade	0.031**	0.042**
Forward participation	2.961***	0.218
Backward participation	1.879**	0.041
Participation lengthy	0.493*	1.496***
Lack of participation diversity	-0.004	0.076
Transport infrastructure	0.214***	0.158**
Large scale of marine transportation	-0.279***	-0.352***
Large scale of air transportation	-0.306***	-0.089**

Contribution and Suggestion

Contributions

- Influence of market fluctuation with GVC, transportation
- Theoretical links to determinants

Suggestions for future research

- Comprehensive set of determinants & effects
- Combing country-level and port-level
- Primary data analysis (SEM via AMOS)