



**CAREC Institute  
Visiting Fellow Program**

**The Influence of the Pandemic on  
the People's Republic of China (PRC)'s Outward  
Foreign Direct Investment in ASEAN and CAREC Regions**

By Nam Foo

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CAREC INSTITUTE





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## Abstract

The global pandemic has posed serious challenges for the entire world economy, including for business activities concerning the outward foreign direct investment (OFDI) by People's Republic of China (PRC)'s. This paper explores the potential economic impact of the COVID-19 crisis on PRC's OFDI, especially on Chinese state-owned enterprises (SOEs) in the Belt and Road countries. The objective of this study is to engage in an in-depth analysis and provide further insights into the attitudes of relevant stakeholders toward the performance of these SOEs with regard to the Belt and Road Initiative in the Association of Southeast Asian Nations (ASEAN) and the Central Asia Regional Economic Cooperation (CAREC) regions in relation to the current global health crisis. Applying the quarterly panel data regression from 2013Q1 to 2021Q2, we find statistically significant outcomes for the business environment in terms of PRC's OFDIs initiated in these countries. The first empirical results show that the global pandemic can impair PRC's OFDIs in ASEAN and CAREC member states. Our study also evidences that the strong connections between the PRC, ASEAN, and CAREC member states in the Belt and Road Initiatives (BRIs) could eliminate the risks. These connections can providing another platform for the PRC to promote shared regional prosperity while resisting counter-globalization and actions from many government forces. In addition, strong economic capacities in line with the demands of the on-going pandemic offers another opportunity for the PCR to develop its foreign economic assistance policy by offering more foreign aid, humanitarian assistance, and health, professional, academic, and culture exchanges to countries along the Belt and Road Initiative (BRI) routes. The study further reveals that the impact of the COVID-19 pandemic can be minimized provided these governments are able to implement useful and effective post-pandemic recovery plans to sustain their economic growth with respect to cross-border FDI for PRC's BRI OFDI investors.

*Keywords:* ASEAN, CAREC, People's Republic of China (PRC), One Belt One Road, OFDI, COVID-19  
Pandemic

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## Abbreviations

ADB	Asian Development Bank
AEI	American Enterprise Institute
AIIB	Asian Infrastructure Development Bank
ASEAN	Association of Southeast Asian Nations
BRI	Belt and Road Initiative
CA	Central Asia
CAREC	Central Asian Regional Economic Cooperation
COVID-19	Coronavirus disease 2019
DSR	Digital Silk Road
ECB	European Central Bank
EU	European Union
FDI	Foreign Direct Investment
FE	Fixed Effect
FTA	Free Trade Agreement
GVC	Global Value Chain
HSR	Health Silk Road
ICT	Information and Communication Technology
LDVs	Lagged Dependent Variables
MPAC	Master Plan of ASEAN Connectivity
OBOR	One Belt One Road
OECD	Organization for Economic Co-operation and Development
OFDI	Outward Foreign Direct Investment
OLS	Ordinary Least Square
PRC	People's Republic of China
RCEP	Regional Comprehensive Economic Partnership
RTA	Regional Trade Agreement
USA	United States of America
USD	United States Dollars
UNCTAD	United Nations Conference on Trade and Development
WHO	World Health Organization
WTO	World Trade Organization

## 1. Introduction

The One Belt One Road (OBOR) initiative arose out of a great vision for the economic integration of the People's Republic of China (PRC) with the rest of Asia as well as Europe and Africa. The initiative to establish a new regional cooperation model by including the Silk Road Economic Belt was first unveiled by PRC's President, Xi Jinping, in Kazakhstan on September 7, 2013. A month later, on October 3, 2013, President Xi once again called for the establishment of the Asian Infrastructure Development Bank (AIIB) and the construction of the 21st Century Maritime Silk Road. The OBOR initiative covers at least 60 countries, which account for 64% of the world population (4.4 billion people) and 30% of the global GDP (\$21 trillion) (Huang, 2016).<sup>1</sup>

The Belt and Road Initiative (BRI) is one of PRC's key national strategies. The "Belt" constitutes the major economic and trade zone for many cities along this route. The objective of the "Belt" route is to establish a new Eurasian land bridge and economic cooperation corridors along PRC–Mongolia, PRC–Central Asia–West Asia, and the Indo-China Peninsula. The "Road" involves major ports, which are to be built in BRI member countries to ensure that the sea route logistics is efficient, safe, and unimpeded. It presents a blueprint to integrate the economy with the broader region and reflects a commitment by the PRC government to develop a more open economy. The strategy constitutes one of the critical points in PRC's economic transformation by enhancing its global influence and sustaining its economic growth by ensuring a closer cooperation with trading partners, including the Association of Southeast Asian Nations (ASEAN).

The overall economic pattern of foreign direct investment (FDI) has changed significantly since the 2000s. This change can be attributed to the serious challenge mounted against the developed countries' domination by emerging economies such as the PRC (Yao et al., 2016). The rate of PRC's outward foreign direct investment (OFDI) has increased substantially to become significantly prominent in recent years. This has been prompted by PRC's structural transformation and domestic production overcapacity (Du & Zhang, 2018). The PRC has been contributing approximately 10% of the global FDI outflows (Duan et al., 2020). The BRI strategy is, to some extent, viewed as a means of strengthening PRC's power and expanding national companies using more closely with territories covered by the OBOR initiative (i.e., the Belt-Road countries). For example, in 2019, the total foreign trade volume in goods was 3.5% or 31.56 trillion yuan (about 4.6 trillion USD). PRC's export reached 17.24 trillion yuan (about 2.5 trillion USD), which represented a yearly growth of 5%, and imports amounted to 14.33 trillion yuan (about 2.07 trillion USD) or a total increase of 1.7% (Duan et al., 2020).

Importantly (because of the emergence of the global health threat), the PRC has now enacted essential procedures to ensure that the OBOR member countries, with its focus on development via infrastructure, do not counter the objective set out in PRC's own *Healthy China 2030* blueprint.<sup>2</sup>

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<sup>1</sup> The Silk Road Economic Belt comprises three general routes. The first route is from the PRC through Central Asia (CA) and Russia to Europe (Baltic Sea). The second route extends from the PRC through CA and West Asia to the Persian Gulf and the Mediterranean. The third route is from the PRC via Southeast Asia and South Asia to the Indian Ocean. The Maritime Silk Road connects mainland PRC's coastal ports to the Indian Ocean through the South China sea and then extends to Africa and Europe. The Maritime Silk Road also connects mainland PRC's coastal ports to the Pacific Ocean via the South China Sea. Additionally, the PRC–Pakistan and Bangladesh–PRC–India–Myanmar economic corridors work closely with the Belt and Road economies.

<sup>2</sup> The PRC has actively initiated its global health blueprint in many countries of Africa, CAREC, and the ASEAN region. This health engagement draws on PRC's unique strengths and promises to deliver assistance through hospital construction, the control of malaria and neglected tropical diseases, the education and training of health workers, drug donations, and cross-border infectious disease control by sharing past experiences with severe acute respiratory syndromes (Tambo et al. 2019).



Since 2013, the PRC has rapidly emerged as a major leader among the OBOR member countries and has played a decisive role in international engagement, especially regarding global health issues (Tang et al., 2017). Besides inflicting suffering and engendering loss of life, the COVID-19 pandemic has caused the world, including the ASEAN and Central Asia Regional Economic Cooperation (CAREC) regions, multiple problems, of which the series of long-running conflicts, sectarian tension, economic crises, and widespread political unrest are particularly noteworthy. This infectious disease, which was first declared as a novel coronavirus disease by the World Health Organization (WHO) on March 11, 2020, has now officially been designated as the COVID-19 pandemic (Chaziza, 2020). The outbreak of this pandemic has since led to a major global health crisis. This study aims to expand our understanding of PRC's economic influence concerning OFDIs on the BRI member countries in the ASEAN and CAREC trade blocs, especially against the backdrop of the global health crisis. A panel regression econometric model factoring in the COVID-19 pandemic as well as OFDI data from the PRC, ASEAN, and CAREC regional blocs will be developed to analyze the various implications of the COVID-19 health crisis on PRC's OFDI.

The pandemic, which began in late 2019, appears set to have a huge impact on OFDI projects worldwide. As a major provider and recipient of OFDI projects, the PRC is expected to be affected significantly (Chazan, 2020). Indeed, PRC's BRI offers immense opportunities for BRI member countries to combat global infections using both laboratory information management systems and health information system, especially for those member nations that have underfinanced public health systems. In fact, the PRC has a good track record of providing development finance for healthcare infrastructure in Asia and, particularly the CAREC member countries (Mouritz, 2020).

The existing literature has explored the impact of the pandemic and its implications for PRC's OBOR foreign trade. Fang et al. (2021) discuss and review the timelines of the evolution of the global pandemic in the PRC, the United States of America (USA), and the world as a whole. Zhao et al. (2021) examine various implications of the COVID-19 health crisis for PRC's export to its trading partner countries. Their study concludes that the pandemic in the PRC has had a significant negative impact on PRC's export trade. Wei et al. (2021) investigate the effect of COVID-19 on exports and imports in the PRC, Japan, and South Korea. Their findings suggest that the impact of the health crisis on domestic imports in the PRC and South Korea are negatively correlated with Japan's imports. In contrast, Japanese exports could be worse off, provided the pandemic in Japan is severe.

Some researchers have investigated the topic from a theoretical perspective. Ye (2021) discusses PRC's policy discourse and activities prior to and post the pandemic outbreak and evaluates the prospects of PRC's BRI. Ye argues that PRC's motivation regarding the BRI has preserved during the global pandemic cycle. In the post-pandemic era, the PRC will likely implement the BRI strategy with more deliberation at home and create more opportunities abroad. Manish and Behera (2021) study the evolving nature of PRC's BRI in CAREC member countries. Their study finds that substantial OFDI in CAREC member countries can provide the PRC with a significant influence in the CAREC region by promoting economic, commercial, strategic, and security interests through bilateral and multilateral engagements. Hu et al. (2017) comment on PRC's BRI from a global health perspective and believe that the BRI can offer another platform to improve the capacity to handle regional public health emergencies by sharing global health information, exchanging preventive and interventional methods, and training health professionals.

Despite the research on the implications of the pandemic for PRC's OFDI having achieved certain outcomes, there remains a perceptible gap. Firstly, the majority of previous analyses only discussed the theories, without establishing an econometric model for empirical analysis. Secondly, the aspects

pertaining to COVID-19 in the ASEAN and CAREC regions have not been well discussed and identified; previous studies have only emphasized and addressed single issues, such as PRC's FDI. Thirdly, the existing studies have not focused much on the economic integration of the regional trade agreement during the COVID-19 pandemic; therefore, this paper examines PRC's OFDI along BRI routes with a particular emphasis on the ASEAN and CAREC regional economic blocs.

In view of the growing attention given to PRC's BRI strategy and the emerging discussion about the impact of PRC's OFDI during this unprecedented period, the following research questions demand further analysis. First, PRC's GDP has declined by 9% in the March quarter of 2020. The significant drop in the GDP growth rate in the PRC is the largest quarterly decline in decades because of major economic sectors being shut down in an effort to contain the COVID-19 outbreak (Kemp & Spearritt, 2021). In the PRC's context, the COVID-19 pandemic is straining economies to the breaking point, but will the BRI presumably remain intact? Hutt (2020) states that the pandemic will weaken PRC's economy and that the country has little choice but to step back and reassess its OFDI in the post-pandemic world. Therefore, the present study seeks to explore how the BRI presents a new window of opportunity to wield influence in the ASEAN and CAREC region economies. Second, by integrating PRC's economy into the world economy, especially with the Southeast Asian nations, does the government primarily aim to maintain the volume and stability of foreign trade and foreign investment? PRC's government has not withdrawn its commitment to new infrastructure projects across the ASEAN and CAREC blocs (Hutt, 2020). Notably, this paper seeks to clarify and develop a new research trajectory by comparing the ASEAN and CAREC regional blocs. Considering, for example, the recent establishment of the Regional Comprehensive Economic Partnership (RCEP) on November 15, 2020, this study will be able to provide some useful research information that could help mitigate the negative impact of trade and economic shocks in the post-pandemic era.<sup>3</sup> Additionally, this paper aims to provide an in-depth analysis of the regional cooperation in CAREC member countries and to define the role of the ASEAN under PRC's BRI strategy. The ASEAN Way, in particular, is a prominent example of a highly successful union integration in Asia.

To address these questions, this study applies a quarterly panel data regression in 2013Q1-2021Q2 (or 340 samples in total) to examine PRC's OFDI BRI projects in the ASEAN and CAREC member countries. Its purpose is to investigate the impact of the pandemic on the PRC's OFDI and the ASEAN and the CAREC regional economies. If confirmed empirically, such results may contribute significantly to the recent literature on the pandemic and its influence on the bilateral FDI relationship between the PRC, ASEAN, and CAREC countries. By developing this research, this paper can certainly outline a clear strategy for an influential contemporary regional economic integration of CAREC member countries under PRC's current BRI strategy.

The remainder of this paper is structured as follows: Section 2 discusses the connectivity of the ASEAN, CAREC member countries, and PRC's OBOR OFDI; Section 3 reviews the impact of COVID-19 and literature related to PRC's BRI; Section 4 introduces the empirical model and the applied methodology and explains the descriptive statistics, variables, and data used in the empirical analysis; Section 5 delineates and discusses the empirical study and assesses the robustness of the results; and Section 6 presents the conclusions of the paper.

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<sup>3</sup> The RCEP is the largest regional free trade agreement (FTA) in the world. The economic bloc consists of the 10 members of the ASEAN (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam) and five regional ASEAN dialogue partner countries with which the ASEAN has existing FTAs – Australia, PRC, Japan, the Republic of Korea, and New Zealand.

## 2. Overview of the PRC outward orientation

PRC's OFDI has increased significantly over the past decade.<sup>4</sup> Most of involved firms that are closely tied to the PRC government have acquired foreign assets and capabilities and pledged billions of dollars to finance infrastructure as well as energy, oil and gas sectors abroad (Global Development Policy Center, 2022; Schwarzenberg, 2020). Many state-owned enterprises investments are funded by PRC's two major policy banks – the China Development Bank and the Export-Import Bank of China. Indeed, some private sectors under the BRI have at times played a vital role in PRC's global investment. To date, PRC's outbound investment flow has exceeded USD\$100 billion (Du & Zhang, 2018). This remarkable achievement has made PRC the world's second-largest overseas investor, and this marks the historical transformation of PRC's economy from being a global manufacturer to a global investor.

At the beginning of the millennium, the PRC government encouraged companies and enterprises to invest abroad, and this has remained an important focus of PRC's economic agenda (Sauvant & Chen, 2014; Luo et al., 2019). This agenda has been enhanced by the launch of the OBOR initiative and has provided strong support for the overseas expansion of Chinese companies.<sup>5</sup> The advancement of these targeted industry infrastructures reflects the fact that PRC's economy is booming and undergoing a significant transformation. Chinese investors are now looking beyond resource-rich countries to the ASEAN and CA regions as attractive investment destinations.

The ASEAN region has a population of more than 600 million people (Ng, 2017). The uniqueness of its large and growing investment market, along with the availability of cheap labor, is one of the attractions prompting the PRC to focus on labor-intensive industries. Additionally, the strategic location of the ASEAN countries offers good economic potential, with a large proportion of the world's shipping lanes going through the region's waters. Maintaining an amicable relationship with the ASEAN countries opens another OFDI opportunity for the PRC to improve its connectivity with other countries situated along the major sea routes. The region also provides opportunities for the PRC to reduce the potential risks of blockades imposed by USA that could hinder exports.

CAREC region comprises of 11 developing member countries. The region made up of Afghanistan, Azerbaijan, PRC, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan, is a massive land mass, which splitting these countries of Eastern Europe and the Caucasus from East and South Asia. These states are endowed with natural resources. The PRC plays a critical role in this region and provides essential economic support to the states' economies (Chawla, 2018; Shadrina, 2019; Melnikovova, 2020). The region has the Caspian Sea bordering to the West, the PRC to the east, Afghanistan to the south, and Russia to the north (Duarte, 2014; Kanapyyanova, 2019). The CAREC region connects the PRC with other regions of the world; hence, this geographical area has become strategically important to the PRC. The PRC is one of the major foreign investors in this region (Umarov, 2020). Similar to the Maritime Silk Road in Southeast Asian nations, CAREC region provides an important platform for the PRC, with diversified land routes that connect PRC's overland trade routes to markets in Europe and West Asia. Through this route, the PRC can facilitate essential

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<sup>4</sup> PRC's OFDIs include both state-owned enterprises and private BRI investment. These BRI investment activities closely match the practice of PRC's Ministry of Commerce (MOFCOM) as well as the transactions disclosed by companies (Scissors, 2020).

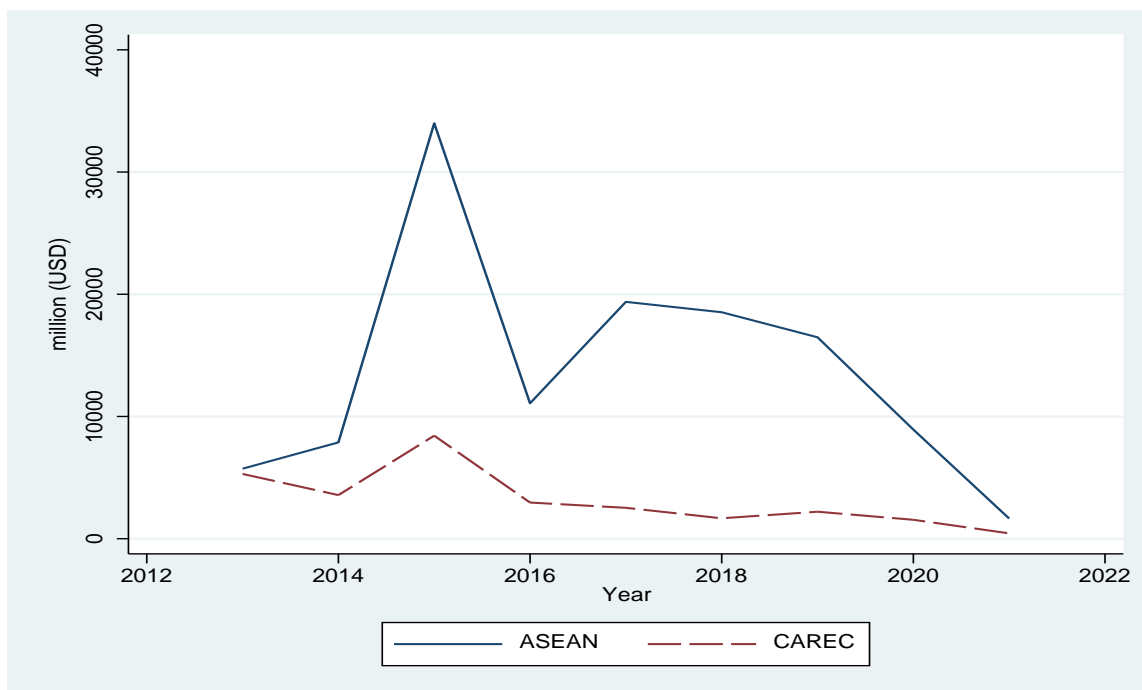
<sup>5</sup> In the early days, PRC's overseas investment activities were mainly focused on the energy and mining sectors. Subsequently, the focus of PRC's OFDI shifted from natural resources to the high-technology and consumption-oriented sectors. Ernst and Young (2015) identify that the high-technology, real estate, finance, agribusiness, and healthcare sectors have become targeted sectors for the PRC economy.

economic development and stability via the Xinjiang province as well as its neighboring CAREC member countries.

### 2.1 Development of PRC's OFDI and BRI

The PRC has been recognized as an important FDI recipient ever since the country's opening-up policy, which was adopted in 1979. PRC's OFDI has increased significantly since the country joined the World Trade Organization (WTO) in 2001. During 2003–2008, PRC's OFDI grew by approximately 73% compared with the world average of 29% (UNCTAD database, 2013). The PRC also tops the list of countries regarding OFDIs in the developing nations, with a high concentration in Asia.

Yao and Sutherland (2009) and Yao et al. (2010) state that the main factor that aids the PRC to emerge as a major international investor is the nation's "Go Global" strategy. Several large state-owned enterprises (SOEs) are established as investment banks by offering soft-budget and easy bank credits to other nations, such as in the ASEAN and CAREC member countries, thus enabling them to secure a long-term and stable supply of natural resources at reasonable prices. Figure 1 presents PRC's OFDI in ASEAN and CAREC regions in the period 2013–2021. The figure indicates that there was a substantial increase in PRC's OFDI from 2014. There is also, however, an indication that this trend has been in decline since 2019 with the outbreak of the pandemic. Interestingly, PRC's OFDI in the ASEAN and CAREC member countries shows a similar investment pattern.



Source: AEI, 2020

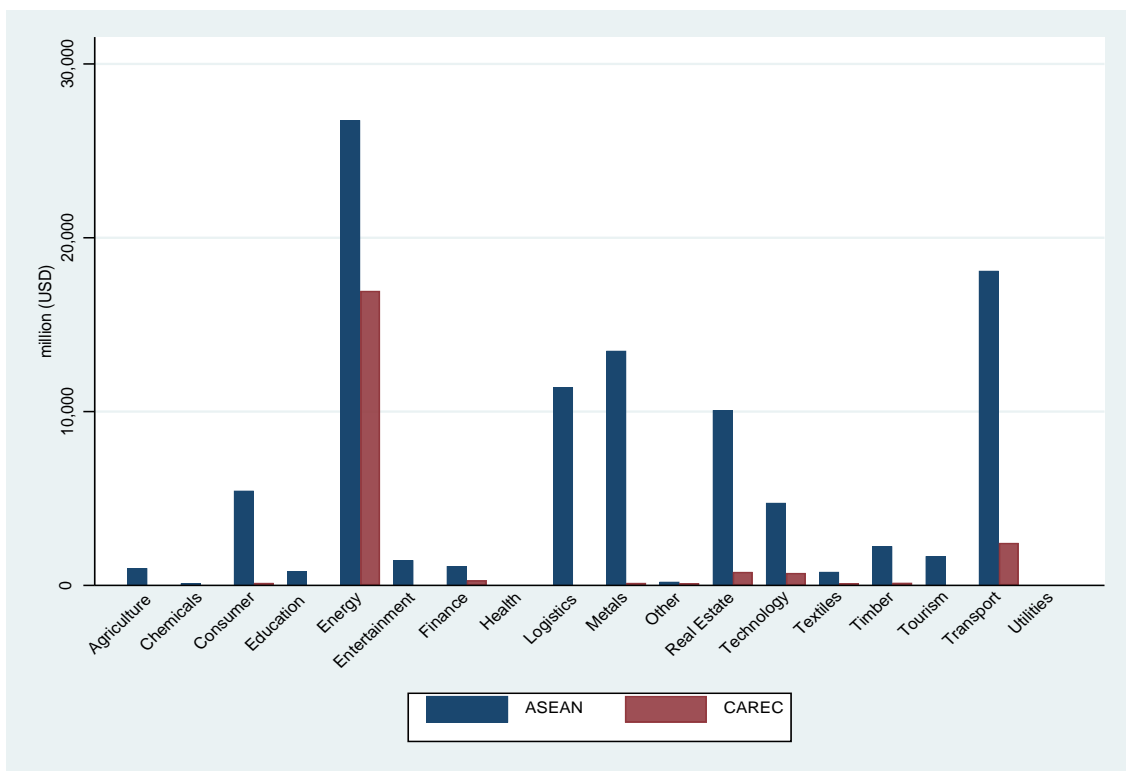
**Figure 1: PRC's BRI OFDI in the ASEAN and CAREC regions**

Figure 2 demonstrates the industrial sectors where the PRC has invested in the ASEAN and CAREC regions. For PRC's OBOR investment strategy, the largest investment in the ASEAN market has been made the energy sector, followed by transport, real estate, and the metal industries. In recent years, industrial sectors such as technology and logistics have played a critical part in PRC's OFDI in the ASEAN region.<sup>6</sup> Figure 2 clearly illustrates that the OBOR initiative is regarded as an infrastructural and

<sup>6</sup> The attractiveness of the industrial sectors where the PRC has made OFDI invested in the ASEAN region is attributed to its member states. For example, resource-rich countries such as Cambodia, Indonesia, and Laos CAREC Institute. Visiting Fellow Program 2022. The Influence of the Pandemic on PRC's OFDI in ASEAN and CAREC Regions

resource-seeking strategy, by which ASEAN nations can receive huge infrastructure investments from the PRC to improve the availability and quality of their logistical facilities (Kang et al., 2018). Figure 2 also evidences the claim that the OBOR initiative is an infrastructure-led OFDI policy (Liu et al., 2018).

In contrast, the BRI investment for Chinese OFDI investment is mainly restricted to primary projects, which involved energy, oil, and gas. The investment rate in this region is slower than its ASEAN counterpart. However, other investment activities by Chinese investors in this region have moved away from the traditional energy, oil, and gas projects to more diversified industries, such as the timber industry in Kazakhstan and the real estate and construction industry in Uzbekistan.



Source: AEI, 2020

**Figure 2: Industrial sectors where the PRC has made OFDI in the ASEAN and CAREC member countries**

There are many contentious discussions about the economy integration of the CAREC economies bloc in a manner similar to the ASEAN since CAREC member countries remain at the nexus of geopolitical interests of great powers such as the PRC, Russia, and the USA (Lee et al., 2020; Iskakava et al., 2021). In spite of the fact that economic cooperation can bring many benefits to CAREC member countries, it is extremely challenging, owing to the region’s dire economic circumstances, which makes economic integration more difficult.<sup>7</sup> Pomfret (2000) argues that the transition of these nations from central

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are mainly attractive to PRC investment in the primary sector. Thailand benefits from the FTA with the PRC, while Chinese investors focus on financial services, trade, shipping, and logistics in Singapore. The least developed Southeast Asian countries, such as Vietnam, have received significant Chinese OFDI in labor-intensive manufacturing. Other factors that encourage Chinese OFDI in ASEAN countries include historical ties and the provision of infrastructure investment projects in Malaysia (Kubny & Ross, 2010).

<sup>7</sup> The ASEAN experienced a similar situation relating to the establishing of regional cooperation in this region, primarily among the developing nations with marked economic inequalities as well as political, social, and cultural diversity (Ishikawa, 2021).

planned economies to market economies could be challenging. However, the integration of transition economies into the multilateral trading system has been a resounding success, and it has been accepted according to the WTO rule-based system, in spite of the violation in international trade policies and performance.

Despite the many impairments in economics and political situation, the CAREC region is extremely motivated about being involved in the BRI. Limited access to finance is the key factor that impedes these countries' economic development. Therefore, PRC's BRI investment projects offer opportunities for CAREC member countries to build viable market-oriented economies as well as connect with the international trade networks (Taliga, 2021)

The "regionalizing" aspect is one of the important qualifications of PRC's approach within the framework of the BRI (Garlick, 2020). Despite the pronounced focus on international transport routes and connectivity between and within regions, Chinese energy investment also plays a significant role in the BRI. Voon and Xu (2020) argue that the BRI is another form of foreign aid that promotes PRC's global image by means of helping emerging economies build infrastructure connectivity and endorse foreign trade and investment. Their findings show that PRC's soft power has significantly increased in counties with BRI land routes, such as those in the CAREC region. Vakulchuk and Overland (2019) note that the PRC must remain cognizant of its role in CAREC region to make the BRI a success. Through its soft-power approach, in the longer run, the PRC can apply its BRI strategy to boost infrastructure development in this region and facilitate foreign trade and investment in CAREC member states together other countries such as the ASEAN countries. This approach can certainly improve PRC's image and perception among the CAREC member states.

The Regional Comprehensive Economic Partnership (RCEP), the world's largest regional free trade agreement comprising the largest population in the world. Without doubt, this innovative agreement will set the new trade policy, which is ties beyond RCEP, with this being especially true of PRC. The PRC can access the benefit of this foreign trade policy to export and encourage the use of digital trade signatures across the BRI and countries the PRC trades with. As 142 countries have BRI agreements with PRC, the development impact of this regional trade can be significant in particularly for CAREC member countries to receive BRI investments (Devonshire-Ellis, 2022). PRC's trade with emerging markets along the BRI is growing in 2021. The impact of the BRI trade levels can be significant especially in Central and Western PRC regions, which are highly integrated with Central Asian economies (Devonshire-Ellis, 2022). This regional trade agreement (RCEP) can be employed to promote greater regional cooperation in trade and investment for CAREC member countries in particularly addressing regulatory issues to ease cross-border movements as well as resolving supply chain issues caused by the massive disruption during the peak of the pandemic (Park et al. 2021).

Industrial structure imbalance, poor infrastructure connectivity, a lack of regional integration, deficiencies in the business environment, and inadequate technological innovation are among the key factors that deter many developing nations from involving themselves in global value chains (GVCs). PRC's BRI has proved instrumental in this respect by offering consultation, contributions, and share benefits in line with the needs of the countries along the BRI routes to bolster local economies and its status in GVCs. The study by Wu et al. (2020) posits that PRC's BRI, its grand connectivity (Chung, 2018), or a project to promote global collaboration (Liu & Dunford, 2016) can positively impact the developing BRI countries to engage in global production and trading systems. In the context of PRC's BRI, contemporary discussions and contentious debates as well as empirical evidence (Wu et al., 2020) suggest that cooperation between the PRC and the countries along the BRI routes, e.g., the ASEAN states and CAREC member countries, are being strengthened.

### 3. Impact of COVID-19 on the BRI

COVID-19, which escalated into a global health pandemic, first emerged in Wuhan, Hubei, PRC, in January 2020. It had spread around the world by November 26, with the confirmed cases of COVID-19 having exceeded 60 million globally (Li et al., 2021). The total confirmed cases in 17 ASEAN nations were at least 869,515, with 21,076 reported deaths as of October 2020 (Djalante, 2020). As of November 2021, Kluge (2021) from the WHO announced that with almost 1.8 million new cases and 24,000 new deaths reported, COVID-19 cases saw an increase by 12% in the CAREC region. This outbreak has had a major impact on the world economy, with the International Monetary Fund (IMF) forecasting the world economy growth in 2020 to be -4.9% (International Monetary Fund, 2020).

Confronted with this challenge, the pandemic's impact on the BRI can be significant, especially in the following three areas: First, the energy and health systems of BRI countries – Since most countries along the BRI route are least developed, their healthcare systems may be unable to cope with the outbreak of COVID-19. Second, disruptions in the global labor flow – Because of the COVID-19 lockdowns, many countries around the world have suspended business activities owing to stringent border measures. Third, the subsequent impact on the BRI host countries, with most nations emphasizing the need to contain the virus rather than responding to economic cooperation and infrastructure construction (Ji, 2020). The disruption of supply chains and labor movement restrictions are the primary and most important reasons for the delay and suspension of BRI projects. Ni (2020) reports that since the outbreak of the global pandemic, BRI projects have been suspended and slowed in ASEAN and CAREC member countries such as Cambodia, Indonesia, and Pakistan. Man-Kong et al. (2021) assert that the COVID-19 global health crisis can severely impair PRC's BRI, especially its OFDI projects, which would profoundly disrupt the global supply chains in ASEAN and CAREC regions.

Since the pandemic's outbreak, many BRI host countries have shifted the emphasis of their fiscal spending to support their medical infrastructure and amenities. This has caused most BRI countries to experience significant social and debt-related issues because many of these countries were already burdened with high debt rates, and they have had to turn to multilateral financial institutions for further emergency loans since (Ni, 2020). The pandemic could also open new windows of opportunity for the PRC to adopt new strategies such as the Health Silk Road (HSR) and the Digital Silk Road (DSR) policies in the longer run (Li et al., 2021).

ASEAN member countries allow one of the important BRI maritime roads for the PRC. Since the outbreak of the pandemic in 2020, the region's GDP and FDI inflows have declined by 3.3% and 33.2% respectively (Pitakdumrongkit, 2021). In line with the post-COVID recovery plan, a form of the RCEP for the ASEAN is critical because the RCEP is the region's most comprehensive free trade agreement (FTA), which includes a wide range of parameters such as competition policy, government procurement, intellectual property, and e-commerce. The RCEP provides a new policy strategy for regional integration focused on multilateral FTAs, trade and investment. The key benefit of this comprehensive strategy is critically relying on the participation and positioning of the respective ASEAN states in GVCs for both manufacturing and services (Thangavelu et al., 2021).

Indeed, the BRI in CAREC member countries can be a critical and challenging matter for the PRC. CAREC is a region with several existing complexities for policymakers, such as vast energy reserves, ethnic and interstate strife, great power rivalries, and encroaching religious extremism (Tang, 2000). Linn (2012) states that the regional organizations in CAREC have been greatly divided and weak, unable to resolve the states' conflicts and implement to demonstrate its main regional infrastructure needs. In this sense, effective regional cooperation among CAREC member countries under PRC's BRI remains a distant dream because of the region's weak institutional cooperation.

Similar research conducted by Ruta et al. (2019) from the World Bank analyzes risks and opportunities for the BRI. The study examines the existing impacts of the BRI economic corridor by developing transport connectivity. The findings suggest that BRI transport connectivity can support and enhance inter- and intra-regional trade, foreign investment, and living conditions for the residents of BRI member states. It is conditioned on the PRC and corridor economies such as the CAREC member countries being able to implement transparency policy reforms by increasing international trade and debt sustainability and reducing corruption risks.

Nicita and Saygili (2021) argue that heterogeneity (both in terms of timing and magnitude) is one of the key factors that has had an effect on international trade during the pandemic outbreak. The disruption of GVCs is caused by the disruption to the world markets (demand and supply) brought on by the measurements to avoid health risks. Their study examines bilateral trade flows of 139 countries, including nations along BRI routes. The findings of this research show that heterogeneous effects of COVID-19 on foreign trade are evident across high-income and low-income nations as well as among the developing countries. Regional trade agreements (RTAs) offer an important platform for nations' trade integration strategies; deep trade integrations can especially make trade more resilient, which can contribute to important development goals. The study by Zhai (2018) presents useful research findings concerning the BRI countries. Zhai concludes that the lack of a reliable institutional policy in most BRI states, extreme political uncertainty along BRI routes that impedes infrastructure projects, a lack of qualified personnel in Chinese firms, and enormous funding conditions are serious challenges encountered by the PRC and other BRI countries when attempting to ensure the effective implementation of this influential strategy.

To mitigate the impact of COVID-19 with respect the underlying economic and financial situation along PRC's BRI investment routes, many governments including from the ASEAN and CAREC regions have offered different policy responses to reduce the risk of the COVID-19 at the least. The study by Felipe and Fullwiler (2020) is worth noting. Their study has provided a comprehensive analysis of the governments' COVID-19 measures and financial assistance announced or estimated by the 68 members of the Asian Development Bank (ADB), two institutions [ADB and the European Central Bank (ECB)], the European Union (EU), and nine other economies, namely Argentina, Brazil, Mexico, the Russian Federation, South Africa, Nigeria, the Arab Republic of Egypt, Saudi Arabia, and the Islamic Republic of Iran.

Regarding COVID-19 policy responses, most governments including ASEAN and CAREC agencies adopted different approaches or actions according to these countries' measurement details and financial circumstances. Most commonly, government agencies provide the following three measures to businesses. First, governments and the central bank can offer loans to financial and non-financial businesses under the state, local, and regional governments. Second, governments can increase in liabilities that do not have direct financial consequences to encourage credit creation such as through interest rate changes and loan guarantees. Third, governments can directly fund households via transfer payments, loan cancellation or deferral and tax cuts. For business, governments can provide equity investments for private sector entities. For regional, local, and state jurisdictions, governments can increase recipients' liabilities via direct loans from the government or reserve/central bank itself (Felipe & Fullwiler, 2020).

The abovementioned government measures mentioned can certainly provide useful strategies to mitigate the impact of COVID-19. However, the pandemic has aggravated the struggles of many BRI countries, particularly low- and middle-income BRI countries, to service their debt. Indeed, the policy responses to mitigate the impact of the COVID-19, better manage potential risks in BRI countries, and



align PRC's goal of debt relief for BRI countries, PRC's government should clarify its role by renegotiating the financial troubles of BRI countries to restructure these countries' public liabilities to avoid default debts and adopt sustainable and transparency debt relief emergency plans for these nations (Yue & Wang, 2021).

#### 4. Methodology

Until recently, the global economy had not yet recovered completely from the COVID-19 crisis. This health crisis has presented additional threats and shocks to many BRI economies. Thus, this paper examines the impact on China's OFDI in the ASEAN and CAREC member countries under the influence of the global pandemic. Importantly, this research scrutinizes how the PRC impacts its trading partners along the BRI routes during the extreme, volatile COVID-19 situation. This paper presents a perspective that the world economy will witness significant decline in cross-border FDI because of the global pandemic. Besides, the government health measures and protocols relating to COVID-19 can directly impact the confidence of Chinese international investors along BRI routes. At the same time, disruptions to the GVCs due to the outbreak of COVID-19 certainly affect the confidence attributed to BRI investment.

The annual project-level database was accessed from the American Enterprise Institute (AEI) using China's Global Investment Tracker. This database has been used widely by researchers such as Chen and Lin (2018) and Nugent and Lu (2021). The list of PRC's OFDI companies during the period 2005–2021 is recorded by the American Enterprise Institute (AEI). The data presented in this study spans from 2013Q1 to 2021Q2. Thus, it is expected that the dataset will be able to offer a very good indication of PRC's OFDI influence in the ASEAN and CAREC member countries in the pre- and post-pandemic periods.

The original dataset employed in the report is disaggregated and contains the following attributes for each investment project: year, month, the name of the domestic establishment and its foreign counterpart, the total funds invested, the share size, the sector and subsector classifications, the host country, and the region. The dataset also indicates whether the project is a greenfield opportunity or has been developed under the BRI.

Employing the model outlined in Fang et al. (2021), the analysis applies the pooled regression ordinary least square (OLS) and fixed effects (FE) estimations for the determinants of the Chinese OFDI. The dataset comprises panel data, and the basic estimation equation is written as follows:

$$\ln ofdi_{i,t} = \alpha + \beta_1 \ln COVID_{i,t} + \beta_2 \ln gdp_{i,t} + \beta_3 ipi_{i,t} + \beta_4 \ln unemploy_{i,t} + \beta_5 trend_{i,t} + \beta_6 year_{2020-21} + \beta_7 \mu_i + \beta_8 \gamma_i + \varepsilon_{i,t} \quad (1),$$

where *ofdi* represents PRC's OFDI in country *i* in time *t*. The advantage of using OFDI relative to the scale of the economy is that the price effect can be eliminated, and this variable (OFDI) can be interpreted as the dependence of GDP on OFDI in economic terms. *COVID*<sub>*i,t*</sub> represents the COVID-19 situation in these regions. The COVID-19 variables considered in this paper relate to new cases, new deaths, cumulative cases, cumulative deaths, and active cases. The purpose of using these five COVID-19 metrics is that the number of cases/deaths can reflect changes in the pandemic. The number of cumulative diagnoses/deaths can indicate the seriousness of the pandemic in these regions. The number of active COVID-19 cases is calculated as the difference between the total number of diagnoses and the number of deaths and recovered cases. *gdp*<sub>*i,t*</sub> denotes real GDP per capita and captures the income level of countries in the ASEAN and CAREC regions, and its impact on PRC's OFDI can be ambiguous. Additionally, income can reflect the quality of domestic labor as well. *ipi*<sub>*i,t*</sub> represents the industrial production index, reflecting a nation's economic activity and prosperity.

$unemploy_{i,t}$  represents the unemployment rate.  $trend_{i,t}$  is the control time trend.  $year_{2020-21}$  is a time dummy variable that equals to 1 in 2020–21 but is otherwise 0.  $\mu_i$  and  $\gamma_i$  are control country- and time-fixed effects.

#### 4.1 Descriptive statistics and data sources

The BRI countries, notably those from the ASEAN region, have received PRC’s several major OFDIs under BRI projects. Meanwhile, CAREC member countries such as Azerbaijan, Kazakhstan, Pakistan, and Uzbekistan are the most active economies having the most investment activities from Chinese investors in the CAREC region. As mentioned above, the data source of these countries’ BRI under Chinese state-owned enterprise investment were obtained from the AEI. The report contains the full data source of PRC’s BRI projects, which had invested around the world. To obtain the dataset for the ASEAN and CAREC regions, each investment project in these regions will be recorded and applied an aggregate data for the analysis. Figure 1 above has used these data to plot the BRI investment projects in the ASEAN and CAREC regions. Table 1 details the summary statistics of all variables used to conduct the analysis in this study.

This research will consider these four CAREC member countries to conduct an empirical analysis. The major home countries for China’s OFDI are all in this group. Our study applies quarterly data on ASEAN and CAREC member countries during 2013Q1–2021Q2. The objective of using the dataset from this period is to explore the impact of the pandemic on PRC’s BRI projects in the ASEAN and CAREC member countries.

The explained variable, PRC’s OFDI ( $lnofdi$ ), is the total value of Chinese foreign aid under the BRI to major trading partners in the ASEAN and CAREC member countries (unit: USD). The data is obtained from the AEI. The aim of this paper is to investigate the impact of COVID-19 on BRI routes in the ASEAN and CAREC member countries. An aggregate dataset is applied in this research; therefore, the paper chooses to restrict the sample data for 2013Q1–2021Q2 as the first case of COVID-19 was found in November 2019 and the BRI began in 2013. By imposing this restriction, this study can engage in an analysis to examine the impact of COVID-19 on PRC’s OFDI to the ASEAN and CAREC member countries. A total of 223 of PRC’s BRI projects have been recorded.

The COVID-19 variables ( $COVID$ ) are measured by new cases, new deaths, cumulative cases, cumulative deaths, and active cases in the ASEAN and CA countries. Data were collected from the University of Oxford, Our World in Data, and TheGlobalEconomy.com.

Data for GDP per capita ( $gdp$ ), the industrial production index ( $ipi$ ), and unemployment rate ( $unemploy$ ) were collected from TheGlobalEconomy.com, CEIC data, and Trading Economics. Specifically, these data have been converted from monthly and yearly data into quarterly panel datasets. These datasets will be employed in an empirical analysis of the impact of COVID-19 on China’s OFDI in the ASEAN and CA member states during 2013Q1–2021Q2.

ASEAN member states				
Variable	Definition	Obs	Mean	Std.Dev
$ofdi_{i,t}$	PRC’s BRI outward foreign investment	340	322.79	860.04
$ncases_{i,t}$	Number of quarterly new confirmed COVID-19 cases	340	14844.7	79792.28

<i>ndeaths<sub>i,t</sub></i>	Number of quarterly new COVID-19 deaths	340	278.44	1750.95
<i>cucases<sub>i,t</sub></i>	Number of quarterly cumulative COVID-19 confirmed cases	340	73478.25	462820.3
<i>cudeaths<sub>i,t</sub></i>	Number of quarterly cumulative COVID-19 deaths	340	1561.19	11426.82
covidindex	Quarterly COVID-19 Stringency Index	340	28.159	66.249
<i>actcase<sub>i,t</sub></i>	Quarterly cumulative cases minus total deaths and recovered cases	340	71910.31	451793.9
<i>gdp<sub>i,t</sub></i>	Economic growth and quarterly percentage change	340	2.284	4.267
<i>ipi<sub>i,t</sub></i>	Industrial production, annual percentage change Value added by industry as percent of GDP	331	12.328	52.651
<i>uemp<sub>i,t</sub></i>	Unemployment rate (%)	340	3.785	3.478
<b>CAREC member states</b>				
<i>ofdi<sub>i,t</sub></i>	PRC's BRI outward foreign investment	340	87.324	404.747
<i>ncases<sub>i,t</sub></i>	Number of quarterly new confirmed COVID-19 cases	339	7750.696	32908.79
<i>ndeaths<sub>i,t</sub></i>	Number of quarterly new COVID-19 deaths	339	145.009	676.632
<i>cucases<sub>i,t</sub></i>	Number of quarterly cumulative COVID-19 confirmed cases	339	51073.98	235918.1
<i>cudeaths<sub>i,t</sub></i>	Number of quarterly cumulative COVID-19 deaths	339	918.378	4761.42
covidindex	Quarterly COVID-19 Stringency Index	340	30.000	76.132
<i>actcase<sub>i,t</sub></i>	Quarterly cumulative cases minus total deaths and recovered cases	339	50154.96	231270
<i>gdp<sub>i,t</sub></i>	Economic growth and quarterly percentage change	340	4.318	5.576

$ipi_{i,t}$	Industrial production, annual percentage change Value added by industry as percent of GDP	327	9.887	27.67
$uemp_{i,t}$	Unemployment rate (%)	340	7.328	3.634

**Table 1: Variables, definition, and descriptive statistics**

## 5. Empirical results and analyses

The analysis made in this paper follows the empirical structure study by Fang et al. (2021). In the present study, the researchers conducted five different COVID-19 analyses in response to China's BRI OFDI. The five COVID-19 variables mentioned in the methodology have been applied in the analysis accordingly. The main focus of this study is the impact of COVID-19 on PRC's foreign trade under BRI projects in the ASEAN and CAREC member countries. The BRI offers resources to help these regions make progress with regional infrastructure development goals such as the PRC–Pakistan Corridor; the new Eurasia Land Bridge; PRC, Mongolia, Russia Economic Corridor; PRC, Central Asia, West Asia Economic Corridor in the CAREC region, the PRC-Indo-China Peninsula Corridor, and PRC, Bangladesh, India, Myanmar Economic Corridor in the ASEAN region (Freeman & Oba, 2019; Gill et al., 2019; OECD, 2018). These six economic corridors located in both the ASEAN and CAREC regions have been an important feature of PRC's BRI development model.

Prior to the empirical analysis, the researchers tested all the variables using Wallace–Hussain Random-Effects Panel Data: Ridge and Weighted regression method. This was intended to avoid any multicollinearity issues that might possibly occur in the dataset, especially in the dataset for the CAREC region, particularly in relation to the five COVID-19 variables. The researcher then conducted a covariance matrix test using a standard panel data regression to ensure the validity of the results. The empirical results showed no multicollinearity problem. Importantly, no one or more variables have been omitted or eliminated in the regression. Table 2 shows the covariance matrix of each variable.

Dependent Variable	GDP (gdp)	Industrial Production Index (ipi)	Unemployment rate (unemp)	Number of cases (ncase)	Number of cumulative cases (cucases)	Number of deaths (ndeaths)	Number of cumulative deaths (cudeaths)	Total of Active cases (actcase)	year <sub>2021</sub>	trend	Constant (cons)
<i>GDP (gdp)</i>	1.000										
<i>Industrial Production Index (ipi)</i>	-0.148	1.000									
<i>Unemployment (unemp)</i>	-0.084	0.321	1.000								
<i>Number of cases (ncase)</i>	-0.150	0.267	0.028	1.000							
<i>Number of cumulative cases (cucases)</i>	-0.048	-0.001	0.180	0.024	1.000						
<i>Number of deaths (ndeaths)</i>	0.138	-0.265	-0.031	-0.892	0.0215	1.000					
<i>Number of cumulative deaths (cudeaths)</i>	0.039	0.030	-0.167	0.023	-0.998	-0.071	1.000				
<i>Total Active cases (actcase)</i>	0.049	-0.000	-0.180	-0.025	-1.000	-0.021	0.998	1.000			
<i>year<sub>2020</sub></i>	-0.131	0.259	0.316	0.043	0.236	0.023	-0.225	-0.236	1.000		
<i>trend</i>	0.264	-0.002	-0.210	-0.105	-0.265	0.008	0.263	0.265	-0.254	1.000	
<i>Constant (cons)</i>	0.004	-0.327	-0.563	-0.037	-0.212	-0.004	0.199	0.212	-0.130	-0.768	1.000

**Table 2: The covariance matrix**

The present study provides empirical results and research insights that explain how the pandemic has affected PRC's BRI projects in these regions in terms of global supply chains and infrastructure connectivity. Notably, the empirical outcomes in this study can suggest possible significant changes to PRC's long-term economic investment strategy, and attempts to assess the reliability of negative views (e.g., the impact of global supply chains in BRI countries; the affordability of developing nations to repay the massive debt incurred from building the BRI infrastructure) on the BRI countries.

Table 3 shows the empirical results of the impact of COVID-19 on PRC's BRI OFDI in the ASEAN and CAREC regions. The paper used a control time trend (*trend*) to break down the timeline since the outbreak of the pandemic. The purpose of using the time trend is to understand the severity of the pandemic's impact on PRC's OFDI investment and economic activities in the ASEAN and CAREC member states.

The regression results of the impact of COVID-19 pandemic on PRC's BRI OFDI in the ASEAN and CAREC regions are promising. The results provided outcomes consistent with previous literature such as Fang et al. (2021) and Zhao et al. (2021). Furthermore, there empirical outcomes are also consistent with the conclusions of other researchers such as Yu et al. (2019) who state that the BRI significantly impacts Chinese OFDI activities. The study by Vidya and Prabheesh (2020) also concludes that the COVID-19 pandemic can impair trade interconnectedness among countries.

There is no doubt that our empirical results show the statistical significance of the negative impacts of COVID-19 on PRC's OFDI investment activities in the ASEAN and CAREC regions (see Fig. 1). These results indicate that the number of new deaths, cumulative deaths, and active cases show statistically significant and negative effects on China's outward BRI projects, with elasticities of -35%, -4%, and -11.2% respectively for the ASEAN member states. For CAREC member states, the effects of COVID-19 on PRC's outward BRI projects are significant, with elasticities of -10.4%, -20.8%, and -21.8% compared to those of their ASEAN counterparts.

Most of the variables in this research are consistent with previous literature as already mentioned. The GDP variable is negatively correlated to the COVID-19 situation in the ASEAN and CAREC region. The GDP variable reflects how these governments effectively control the pandemic and sustain their economic growth both for the PRC and the host countries by using appropriate COVID-19 health measures. The empirical results clearly evidence that the income level in these two regions is deeply affected by the COVID-19 pandemic. The longer the lockdown restrictions or measures are in place, the more substantial the impact of the GDP or income.

These results indicate that government agencies in the ASEAN region can manage and control COVID-19 successfully and effectively to ensure that their economies maintain sustainable growth. For instance, an agreement of ASEAN RCEP can be one of the important achievements for the ASEAN region to sustain economic growth for PRC's OFDI. A long-standing association between ASEAN and its Master Plan on ASEAN Connectivity 2025 (MPAC) and PRC's BRI projects in this region can certainly put forth important conclusions regarding how this region can maintain its economic growth. The empirical results of this study (Table 2) have showed strong evidence in this regard.

<b>ASEAN member states</b>					
Dependent variable = Outward Foreign Direct Investment					
COVID	(1) Number of cases	(2) <i>Number of deaths</i>	(3) <i>Cumulative cases</i>	(4) <i>Cumulative deaths</i>	(5) <i>Total active cases</i>
<i>Number of cases</i>	0.008* (0.004)				
<i>Number of deaths</i>		-0.35* (0.21)			
<i>Cumulative cases</i>			0.111 (0.692)		
<i>Cumulative deaths</i>				-0.04 (0.695)	
<i>Total active cases</i>					-0.112 (0.669)
GDP	-8.316 (15.192)	-8.297 (15.081)	-7.907 (15.163)	-8.547 (15.073)	-7.891 (15.165)
Industrial Production Index	0.10 (0.951)	0.107 (0.920)	0.169 (0.947)	0.062 (0.912)	0.172 (0.948)
<i>Unemployment</i>	-3.154 (28.005)	-2.704 (26.814)	-2.551 (28.109)	-2.999 (26.652)	-2.537 (28.147)
<i>Time trend</i>	0.356 (1.044)	0.306 (0.996)	0.360 (1.053)	0.309 (0.989)	0.362 (1.054)
<i>year2020</i>	-173.463 (159.585)	-165.257 (155.244)	-166.257 (154.741)	-177.303 (151.825)	-166.002 (154.805)
<i>Country Fixed Effect</i>	YES	YES	YES	YES	YES
<i>constant</i>	328.646 (248.001)	335.443 (237.075)	323.88 (249.578)	337.178 (235.593)	323.501 (249.946)
<i>observations</i>	331	331	331	331	331
<i>R-squared</i>	0.8736	0.8736	0.8437	0.8691	0.8432

CAREC member states					
Dependent variable = Outward Foreign Direct Investment	(1)	(2)	(3)	(4)	(5)
COVID	Number of cases	Number of deaths	Cumulative cases	Cumulative deaths	Total active cases
<i>Number of cases</i>	0.002 (0.002)				
<i>Number of deaths</i>		-0.104 (0.146)			
<i>Cumulative cases</i>			0.000 (0.000)		
<i>Cumulative deaths</i>				-0.208 (2.783)	
<i>Total active cases</i>					-0.218 (2.781)
<i>GDP</i>	-0.094 (5.194)	-0.127 (5.193)	0.056 (5.215)	0.119 (5.21)	0.067 (5.216)
<i>Industrial Production Index</i>	0.127 (0.913)	0.154 (0.913)	0.08 (0.919)	0.087 (0.923)	0.078 (0.919)
<i>Unemployment</i>	-18.284** (8.254)	-18.55** (8.164)	-17.552** (8.63)	-17.483** (8.688)	-17.513 (8.65)
<i>Time trend</i>	-0.140 (0.323)	-0.142 (0.318)	-0.14 (0.339)	-0.141 (0.342)	-0.14 (0.34)
<i>year2020</i>	-58.331 (78.315)	-49.876 (76.335)	-60.423 (76.842)	-56.344 (74.326)	-60.334 (76.877)
<i>Country Fixed Effect</i>	YES	YES	YES	YES	YES
<i>constant</i>	255.97*** (95.767)	258.152*** (94.556)	250.223*** (100.621)	249.523** (101.338)	249.907** (100.897)
<i>observations</i>	326	326	326	326	326
<i>R-squared</i>	0.3394	0.3155	0.4255	0.4390	0.4304

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* represent significance levels of 1%, 5%, and 10% respectively.

**Table 3: Empirical outcomes of the impact of COVID-19 on PRC's BRI OFDI in ASEAN and CAREC member states**



Contrarily, the impact of COVID-19 on PRC's BRI projects in CAREC member states can imply a different and alarming prospect. The empirical result on GDP indicates that the effect of COVID-19 can impair this region by declining its economic growth to 9%-13%. This empirical result is significant, and it reflects how the current COVID-19 situation can impede PRC's OFDI in this region. Additionally, the effectiveness of the CAREC region governments in responding to the post-COVID recovery plan and in attracting foreign investment remains unsolved and challenged.

Indeed, this is mainly a landlocked CAREC region with countries such as Azerbaijan, Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan highly relying on efficient regional transport connectivity. Different government policies incorporating the COVID-19 lockdown and inconsistency protocol measures in these countries certainly affect this region's GDP and delay the progress of BRI projects. Other factors such as political instability, terrorism, governance and institutions (e.g., imperfect legal framework and weak economic management) can also help explain why the CAREC member states have lower GDP, but these factors are beyond the scope of this research. The study by Foo et al. (2019) states that PRC's BRI is a promising strategy, and it facilitates trade in ASEAN countries and other BRI regions such as CAREC nations.

From PRC's perspective, the BRI projects certainly can benefit CAREC member states as well as other regions such as ASEAN. However, improving the economic growth in CAREC member countries in the post-pandemic era necessitates a mutual agreement between the PRC and CAREC member states to develop good transport connectivity within the region. A good transport system can reduce the transportation time by shipping goods and services without any delays. Such a network is extremely important in the CAREC region and can certainly contribute significantly to the economic growth of this area.

### 5.1 Heterogeneous effects

The researchers conducted an analysis of the heterogeneous effects of COVID-19 impacts on PRC's OFDI in BRI routes in this section. We are now considering the grouping heterogeneity of ASEAN and CAREC regions as one trade regional bloc. This (one regional trade bloc) may lead to a different outcome on the impact of the COVID-19 pandemic on PRC's OFDI. In accordance with the previous regression, a panel regression model is used to perform group regressions, and the results are shown in Table 4. This study evidences that heterogeneous effects do impact PRC's BRI in the relevant areas.

The results are statistically significant in these member countries and reveal that COVID-19 negatively impacts employment and growth. The empirical evidence further supports the results given in Table 2 for both the ASEAN and CAREC regions and the impact of COVID-19 shows similar related effects for both regions, particularly concerning economic growth and jobs, which is quite alarming for policymakers who would need to ensure effective policy implementation to resolve the dire economic situation in the aftermath of the pandemic.

The results further suggest that the global pandemic can affect PRC's OFDI in the BRI route. As per most academic literature, COVID-19 triggered one of the most significant economic shocks of the last twenty years (Schulhof et al., 2021). Even if a recovery from the impact of COVID-19 in relation to PRC's OFDI BRI project can be quickly affected, these outcomes strongly suggest that it would be a new challenge for Chinese policymakers in the post-pandemic era. Chinese government authorities will have to employ effective BRI strategies to build and develop foreign diplomatic connections with the countries in this region to maintain its emerging role as a leading economic power of the world.

<b>ASEAN + CAREC regions</b>					
<b>COVID</b>	(1) Number of cases	(2) Number of deaths	(3) Cumulative cases	(4) Cumulative deaths	(5) Total active cases
<i>Number of cases</i>	-0.0003 (0.0005)				
<i>Number of deaths</i>		-0.021* (0.022)			
<i>Cumulative cases</i>			-0.00006 (0.000081)		
<i>Cumulative deaths</i>				-0.002 (0.003)	
<i>Total active cases</i>					-0.00006 (0.00008)
<i>GDP</i>	-4.883 (6.513)	-4.686 (6.516)	-4.779 (6.515)	-4.674 (6.523)	-4.781 (6.514)
<i>Industrial production index</i>	0.131 (0.663)	0.144 (0.649)	0.168 (0.663)	0.103 (0.646)	0.170 (0.663)
<i>unemployment</i>	-16.25 (12.087)	-16.329 (12.11)	-16.209 (12.002)	-16.474 (12.094)	-16.202 (12.001)
<i>Time trend</i>	0.038 (0.265)	0.031 (0.266)	0.036 (0.263)	0.033 (0.266)	0.036 (0.263)
<i>year2020</i>	-102.901 (85.172)	-94.6 (83.357)	-98.708 (83.974)	-104.000 (82.095)	-98.601 (84.016)
<i>Country Fixed Effect</i>	YES	YES	YES	YES	YES
<i>constant</i>	320.417* (134.471)	322.002* (134.918)	320.002* (133.436)	322.623* (134.726)	319.925* (133.424)
<i>observations</i>	657	657	657	657	657
<i>R-squared</i>	0.3895	0.3361	0.3574	0.3722	0.3571

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* represent significance levels of 1%, 5%, and 10% respectively.

**Table 4: Empirical outcomes of the impact of COVID-19 on PRC's BRI OFDI across all regions**

## 5.2 Robustness tests

After investigating the implications of the global pandemic on PRC's BRI OFDI in the ASEAN and CAREC regions, the research further examined the robustness of these variables with regard to the COVID-19 pandemic. In this case, following the research by Zhao et al. (2021), the researchers compiled the ASEAN and CAREC member countries into one dataset using one lagging period effect to investigate the abovementioned five COVID-19 variables – number of confirmed cases, cumulative number of confirmed cases, number of confirmed deaths, cumulative number of confirmed deaths, and total active cases. The purpose of using lagged dependent variables (LDVs) is to provide robust estimates of the effects of independent variables. The stringency index is then used to replace all five COVID-19 variables. The stringency index is important to evidence how the strict government policies, for example, lockdown restrictions and closure measures, affect people's behaviors, which will have a significant impact on policy-making.<sup>8</sup> Table 5 provides the robustness test results of the impact of COVID-19 on China's BRI OFDI.

<i>Region/Dependent variable (lnOFDI)</i>	<i>ASEAN</i>	<i>CAREC</i>	<i>ASEAN + CAREC</i>
	(1)	(2)	(3)
<i>Covid-19 Stringency Index</i>	-1.453 (1.916)	0.044 (0.640)	-0.369 (0.86)
<i>GDP</i>	-10.382 (15.171)	1.237 (5.197)	-4.453 (6.489)
<i>Industrial Production Index</i>	-0.067 (0.984)	-0.159 (0.923)	0.001 (0.634)
<i>Unemployment</i>	-3.568 (28.782)	-5.747 (13.642)	-15.820 (13.041)
<i>Time trend</i>	0.441* (1.096)	-0.148 (0.683)	0.041 (0.293)
<i>year2020</i>	21.954 (327.117)	-73.921 (131.063)	-58.658 (162.451)
<i>country Fixed Effect</i>	YES	YES	YES
<i>constant</i>	323.872 (257.607)	162.216 (181.978)	316.478* (147.3)
<i>observations</i>	331	327	658
<i>R-squared</i>	0.8249	0.7	0.4705

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* represent significance levels of 1%, 5%, and 10% respectively.

**Table 5: Robustness test on the impact of COVID-19 on PRC's BRI OFDI with one lagging period.**

<sup>8</sup> There are nine metrics to estimate the stringency index. These metrics include school closures; work at home measures; cancellation of public events; limited people for public gatherings; closures of public transport; stay-at-home orders; public information campaigns; restrictions on internal movements; and international borders controls.

The conclusion of this study remains unchanged even after adopting various approaches to conduct a robustness test by gradually adding or changing the control variables. Thus, the study implies the robustness of the result. The study concludes that COVID-19 has negatively impacted PRC's BRI OFDI in the regional economic blocs. Despite these negative impacts resulting from the global pandemic, PRC's BRI OFDI can be of benefit for these regional economic blocs, provided appropriate economic measures are implemented by the public agencies. A positive GDP growth and lower unemployment rate, given in Table 5, strongly highlight this scenario through regional economic integrations. Based on these findings, the study notes that CAREC nations should integrate their regional economy by taking the ASEAN economic bloc as an example. These economic transformations can certainly be improved and made more robust by eliminating cultural and political barriers and conflicts. PRC's BRI OFDI focuses on infrastructure connectivity within this region and can play a crucial role that would assuredly benefit this region.

## 6. Conclusions and policy recommendations

The pandemic has severely hit all regions of the world. This global threat has brought serious impact on and challenges to economic and trade development in the PRC and other regional economies as well the ASEAN and CAREC member countries. Despite the extant literature expressing different views on the impact of COVID-19, many researchers argue that the BRI can be of benefit to these regional blocs, and these economies can take advantage of PRC's BRI OFDI. However, the agencies have to deal with the pandemic and minimize the investment risk to benefit from PRC's BRI OFDI in the region, which can be challenging.

The present study used quarterly panel datasets between 2013Q1 and 2021Q2 to investigate the effect of COVID-19 on PRC's BRI OFDI in the ASEAN and CAREC regions. The study provides in-depth analysis of the implications of the COVID-19 pandemic and foregrounds how the current situation can transform the entire investment activities and economic impacts in these regions. The empirical outcomes show the heterogeneous effects of COVID-19 on PRC's BRI OFDI in the relevant regional economic bloc. The main findings of this study can be delineated as follows. First, the global pandemic has had significant negative impacts on PRC's BRI OFDI in the ASEAN and CAREC member states. Second, the study conveys an important message to CAREC member countries that economic integration is critical. PRC's BRI route certainly brings benefit to this region such as strong and robust infrastructure connectivity, but the government agencies in this region must also remove all the barriers to sustain GDP economic growth in the post-pandemic era. ASEAN can be a good example for the CAREC member countries to emulate. Third, the effects of the pandemic can be minimized, and PRC's BRI can stimulate regional growth, provided a regional economic integration is well-developed and governments are able to implement effective post-pandemic recovery plans or protocols.

In fact, the primary challenge to PRC's BRI OFDI comes from the shrinking investment induced by technology and market obstructions and restrictions imposed by developed nations. Thus, a close connection with the ASEAN and CAREC member countries as well as other neighboring developed Asian economies such as Japan and Korea to prompt deeper bilateral economic and investment cooperation is necessary. These connections can be another platform for the PRC to promote shared regional prosperity while resisting counter-globalization. Additionally, strong economic capabilities in line with the demands of the on-going pandemic offers another opportunity for the PRC to build and expand its foreign economic assistance policy by providing foreign aid, humanitarian assistance, and health, professional, academic, and cultural exchanges to the countries along the BRI routes. The guiding principle behind the BRI is evident: it is an initiative to connect diverse communities and cultures and provide economic advantages and incentives (Carminati, 2020). Despite the global health threat significantly affecting and delaying the BRI's ongoing projects, the urgent need for

infrastructure development along the BRI routes has not been affected by COVID-19. Additionally, the criticism about PRC's BRI emerging from the West is only minimal, and the evidence is inconclusive. Therefore, this topic requires further discussions and in-depth research using empirical analysis and available data.

### 6.1 Policy implications

This study suggests four policy recommendations for ASEAN and CAREC governments to promote and strengthen the regional economy. These policies are 1) a policy to promote the digital economy; 2), a policy to facilitate trade and investment; 3), a policy that sustains and supports green investments, and 4), people-to-people connectivity policy. The following policy recommendations can be applied by ASEAN and CAREC public agencies to improve and bolster the regional economy.

- i. A pragmatic approach to the digital economy, a sector that has played an important role during the global pandemic should be considered seriously by the ASEAN and CAREC member countries. This policy is extremely important for many low-income economies in the regions to improve information and communication technologies (ICT) such as a better computer network to facilitate trade measures, free cross-border flow of data, and less stringent approaches to data localization. The ASEAN region is one of the key partners in this area, and CAREC member countries can consider adopting this ICT policy. Additionally, a strong commitment and prioritization to promote e-commerce security such as preventing the leak of information from online consumers and their personal information as well as enhancing the regional regulatory framework to ensure the transparency and cybersecurity always constitute a critical issue in many ways for the governments, the global and local media, and communities in general. By working through and adopting appropriate ICT policy, small- and medium-sized enterprises can expect to benefit from this policy in line with the awareness of the important of these issues (trade facilitation, regulatory framework, and cybersecurity).
- ii. The recently formed RCEP is one of the major regional trade partnerships in Asia. The agreement is between the 10 ASEAN members as well as Australia, the PRC, Japan, the Republic of Korea, and New Zealand. The RCEP trade bloc is also the world's largest, both in terms of population and GDP. This agreement can certainly increase trade and investment and improve regional cooperation among these Asia-Pacific countries. The ASEAN countries have already taken the advantage by signing this agreement. For the CAREC region's governments, a consideration to strengthening the connections with this regional trade bloc is extremely critical. CAREC member countries are extremely important for the BRI investment, and they make up one of the prominent trade routes (Silk Road) in the world. A strong infrastructure connectivity between these countries is the key feature to ensure trade with the world and the rest of the region. Therefore, governments' commitment to working with RCEP members can benefit and sustain the economic growth particularly for the manufacturing industry. Most exports from CAREC member countries are mineral resources and agricultural products such as wool and cotton. One of the key features of the RCEP members is the preferential tariff status is no longer required. This is because manufacturers within the RCEP have not limited to manufacture a goods in one country. Manufacturers can establish supply chains across the RCEP region. Provided the non-member country has a free trade agreement with an RCEP member, the non-member can be benefited according to the rules of original criteria to access the RCEP.
- iii. Emerging and developing economies encounter a rising demand for energy and mobility because of rapid urbanization and industrialization. Therefore, agencies actively engage in the Belt and Road initiatives certainly offer a new development paradigm through investment in

green infrastructure that can minimize the effect on global climate change. Climate change is real. A BRI investment deploying low-carbon technology such as wind, solar power, battery storage, and electric vehicles are technologically feasible, which enable developing green and low-carbon energy that should be strongly encouraged and supported by the policymakers, not only the leadership of the BRI for the PRC but also the ASEAN and CAREC member countries. The PRC's two major policy banks – the China Development Bank and the Export-Import Bank of China should play an important role in shifting funding flows from carbon-intensive to mobility with low-carbon technologies particularly when assessing the BRI investment projects. By promoting green investment BRI projects, this policy can decouple economic development from emissions trajectories and help drive sustainable infrastructure projects. The combination of the effect of COVID-19 and climate change certainly provide a new challenge for policymakers to mitigate.

- iv. Human capital is one of the world's most important, critical, and indispensable resources. Regional and global process can both benefit from human mobility. Human mobility such as migration promotes shared development. These types of labor (migrants' mobility) contribute to development in many ways. For instance, the highly skilled mobile workers can operate as creators, multipliers, and transmitters of knowledge and they show willingness to take risks. The low- and middle-skilled workers can contribute across the board to societies and economies with "skilled hearts and hands." No doubt, PRC's BRI could speed up economic development and reduce poverty for a dozen of the low-income developing nations. A policy strengthening human capital such as through education, research and training led by the PRC along with these least developed countries can transform these nations' average income and economic development that fully benefits from the BRI. A policy to promote people-to-people connections can play a crucial role in this process. People-to-people exchanges are the central point of social economic development. Through these exchanges, people can sustain development and benefit from the development they engender Human connectivity such as through transport and travel, trade and services, communication and knowledge exchanges can be avenues for the development of diverse and innovative workforces that are ready for the challenge in association with COVID-19 protocols for producing goods and delivering services for the global market that the BRI aims to deliver.

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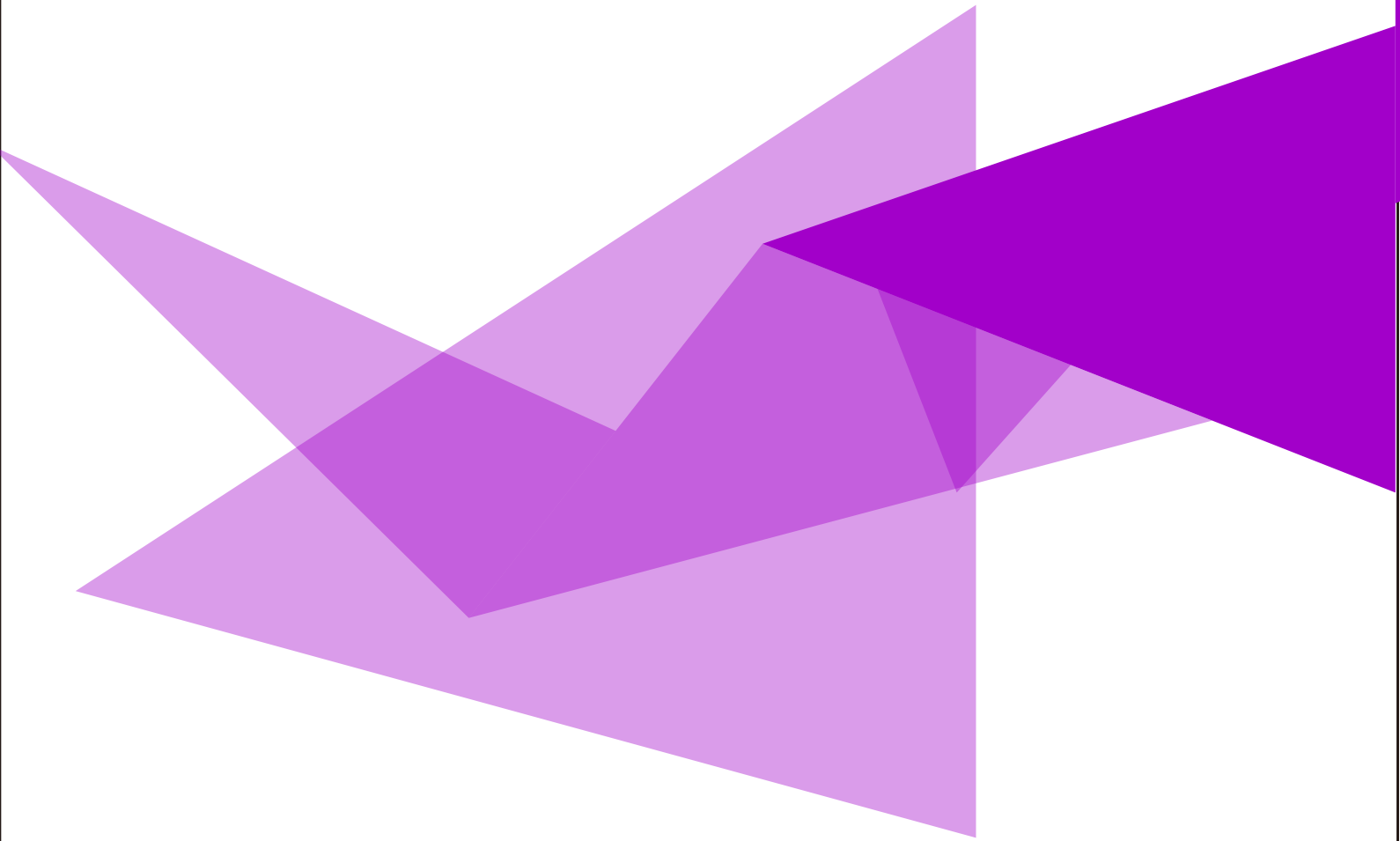
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