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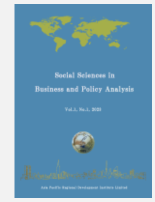

Inaugural Statement

It is with great pleasure and anticipation that we introduce to you the inaugural issue of Social Sciences in Business and Policy Analysis, a groundbreaking academic journal dedicated to exploring the intricate relationship between business and public policy in the face of a rapidly changing world. In this era of unprecedented scientific and technological progress, as well as daunting challenges such as climate change and environmental pollution, the need for comprehensive research and innovative solutions has never been more critical.

The interplay between business and public policy has always been symbiotic, shaping and influencing each other in profound ways. As the geopolitical landscape undergoes dramatic transformations, governance becomes increasingly complex for policymakers in countries and regions worldwide. The decisions made by governments have far-reaching consequences for businesses, societies, and individuals, necessitating a deeper understanding of the intricate dynamics at play. Likewise, businesses have a profound impact on public policy through their economic activities, corporate social responsibility, and engagement with various stakeholders.

The challenges we face today demand a multidisciplinary approach that draws from social sciences to analyze and address the complex problems affecting our societies. Housing, food, transportation, consumption, and investment—these fundamental aspects of human life—are inextricably linked to the evolving geopolitical landscape and the growing urgency of environmental sustainability. To navigate the uncertainties brought about by these changes, we firmly believe that social sciences must play a central role in providing insights, ideas, and methodologies to the global academic, political, and business communities.

Social Sciences in Business and Policy Analysis aims to be at the forefront of this transformative journey. Our journal serves as a platform for rigorous scholarly research, thought-provoking analyses, and innovative ideas that bridge the gap between theory and practice. By fostering dialogue and collaboration between academia, policymakers, and business leaders, we aspire to generate actionable knowledge and evidence-based recommendations that can shape public policy, inform business strategies, and contribute to the betterment of society at large.

Within the pages of this journal, you will find a diverse range of articles that delve into the intricate complexities of the interactions between business and public policy. Our esteemed contributors, hailing from various disciplines within the social sciences, offer fresh perspectives, empirical insights, and theoretical frameworks to illuminate the challenges we face and the opportunities that lie ahead. Through rigorous peer review and meticulous editorial oversight, we present you with a collection of scholarly works that represent the highest caliber of academic thought and research.

As we embark on this intellectual journey together, we invite you, our readers, to actively engage with the ideas presented within these pages. We encourage policymakers to draw upon the research findings to inform their decision-making processes, businesses to incorporate the insights into their strategies for sustainable growth, and scholars to build upon these works to advance our collective understanding of the complex interplay between business and policy.

In the spirit of fostering collaboration and knowledge exchange, we welcome diverse perspectives, interdisciplinary research, and innovative methodologies that push the boundaries of traditional scholarship. Together, let us embark on a quest to unravel the complexities of our world, inspire evidence-based action, and forge a more sustainable, equitable, and prosperous future for all. We extend our heartfelt appreciation to the authors, reviewers, editorial board members, and the dedicated team behind the scenes who have made this journal a reality. Your invaluable contributions have laid the foundation for a vibrant academic community dedicated to exploring the nexus of social sciences, business, and public policy. With unwavering commitment to knowledge, innovation, and impact, we present to you the inaugural issue of Social Sciences in Business and Policy Analysis. May it ignite curiosity, spark meaningful conversations, and inspire transformative change.

Editor Team

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Logical Structuring and Risk Analysis of Development Shifts in the Middle East Region

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KEYWORDS

Middle East;
International Relations;
Geopolitical Dynamics;
Israel-Palestine Conflict;
Balance of Power Theory

ABSTRACT

In the evolving landscape of international relations, the Middle East stands at a pivotal juncture, influenced by both historical legacies and contemporary geopolitical dynamics. This paper delves into the intricate interplay of socio-political, economic, and geopolitical factors shaping the region's trajectory. Amidst the backdrop of global power shifts, the Middle East's development narrative underscores the necessity of cooperative solutions. However, multifaceted risks, including escalating security dilemmas, economic challenges, and geopolitical rivalries, threaten its stability. Using the balance of power theory, this study integrates the dynamics of the Middle East with the broader landscape of international politics, aiming to unearth the underlying logic behind its policy directions. The recent resurgence of the Israel-Palestine conflict serves as a focal point, reflecting broader tectonic shifts in the global balance of power. The paper concludes by emphasizing the importance of cooperative endeavors and a nuanced understanding of the region's dynamics for ensuring peace and prosperity.

1. Introduction

In the post-pandemic era, the sluggishness of the global economy and the turbulence of the international political order have posed unprecedented challenges to international relations. The risks of regional conflicts and geopolitical crises are escalating, reflecting not only shifts in the traditional power structures but also the emergence of new geopolitical dynamics. The armed conflict between Russia and Ukraine in 2022 undoubtedly serves as a significant marker for this period. This confrontation not only signifies a turning point where the conventional international order begins to crumble but also clearly embodies the trend of multipolar world development. This event showcases the competition and antagonism among major powers while revealing the challenges and opportunities faced by smaller nations in the new international context. Against this backdrop, the Middle East, positioned at the heart of the Eurasian landmass, is also exhibiting new developmental characteristics. Reconciliation and cooperation are becoming the prevailing trends in the region, reflecting a reconsideration of long-standing conflicts and confrontations and an adaptation to the new international milieu.[1] This trend seems to herald a reintegration of the Arab world, offering renewed hope for peace and prosperity in the region. However, the resurgence of the Israel-Palestine conflict introduces an element of uncertainty to this positive trajectory. This conflict not only epitomizes the enduring disputes in the Middle East but also mirrors the evolving geopolitical dynamics. This situation not only jeopardizes peace and stability in the Middle East but also challenges the region's multilateral diplomacy. In such circumstances, how to balance the interests of all parties and ensure regional peace and stability becomes a paramount task for Middle Eastern nations. A series of intricate shifts cast a shadow over the developmental prospects of the Middle East. Given this context, systematically sorting out and analyzing the multi-dimensional changes in the region, and scientifically discerning its characteristics and trends, is emerging as a crucial issue in international political studies.

2. Literature review

The Middle East has historically been a confluence of global political, economic, and cultural interactions. In recent years, the evolving situation in the region has garnered widespread academic attention. From a historical perspective, J. Lasmar and Leonardo Coelho Assunção Santa Rita revisited the Middle East's transformation into a stage for a series of regional conflicts and major power disputes since the demise of the Ottoman Empire.[2] They highlighted that these confrontations have profoundly influenced the evolution of the region's security complexities. From a geopolitical standpoint, Olivia Glombitza and K. Ulrichsen delved into the myriad changes in regional and domestic orders in the Middle East and the Persian Gulf post-2011. They posited that ideational factors play a pivotal role in both peace-building and threat construction, suggesting that achieving regional peace and stability requires not only material resources and tangible actions but also appropriate perceptions and thought processes.[3] M. Beck and T. Richter examined the shifts in the regional order in the Middle East following the Arab Spring, proposing that a new regional order, describable as a highly contested multipolar system, has emerged. This unstable regional system is reinforced by three facets: the securitization of policies, the increasing fragmentation of regional institutions, and the emergence of persistent conflict zones.[4] From a political and constitutional lens, Berna Öney analyzed the ideological dimensions of constitutions in the Middle East and North Africa, arguing that this dimension can be defined by a nation's openness to freedom and modern values. The article also presented evidence of the fourth phase of Islamic constitutional development, integrating the concept of the rule of law with Islamic norms, indicating that political and constitutional factors also play a crucial role in the region's evolving situation.[5] Some Chinese scholars have also explored this issue from various dimensions such as causes, characteristics, and trends.[6]-[12]

While these studies elucidate the developmental logic of the Middle East in modern times to some extent, the region's recent significant policy shifts have introduced new dynamics that existing research struggles to explain. The changes in the region are intricately linked to global political shifts. Balance of power theory posits that the distribution of power in the international system influences state behavior and the stability of the international order.[13] While the theory has various forms and variants, its core assumption is that states are rational, self-interested, and security-seeking entities that choose strategies of cooperation or competition based on perceived benefits and threats.[14] The theory also suggests that states respond to powerful or rising adversaries through balancing or bandwagoning to maintain or alter the power equilibrium in the international system. Thus, this study employs the analytical framework of the balance of power theory(Figure 1), attempting to integrate the dynamics of the Middle East with the macroscopic landscape of international politics, aiming to unearth the underlying logic behind its series of policy directions. Ultimately, this research endeavors to discuss the developmental characteristics and future trajectories of the region, offering insights for related studies in international politics.

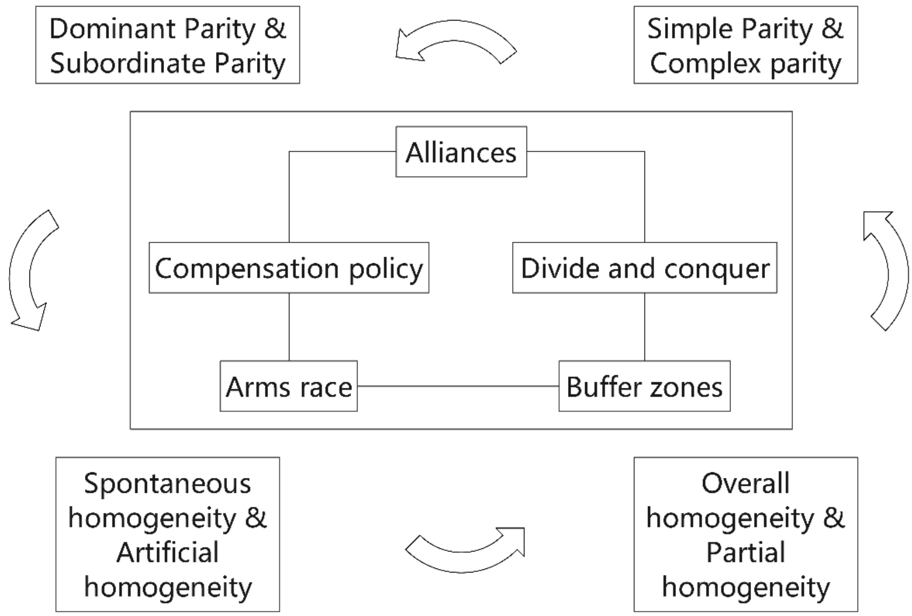

Figure 1 Basic framework of the balance of power theory

3. Reconciliation and Cooperation: New Trends in Middle Eastern Development

3.1 State Development as the Mainstream Governance Orientation

The modernization journey of Middle Eastern countries has been tumultuous, marked by conflicts in ideology, religious thought, class relations, and geopolitics. As a latecomer in development, the Middle East's dynamics are constantly influenced and intervened by global superpowers, infusing the region's growth with uncertainties.[15] This can be primarily observed on two fronts: domestically and internationally.

Firstly, on the domestic front, Middle Eastern countries are susceptible to the interference of dominant powers.[16] For their vested interests, elites, religious leaders, and military warlords often directly intervene in governance, disregarding the nation's modernization. This leads to a divergence between individual and collective interests. On the other hand, imbalances in industrial structures and a scarcity of human resources have kept economic growth at a low level, offering little momentum for modernization.

Secondly, from an international perspective, the Middle East has long been at risk of geopolitical conflicts. The reasons are multifaceted, encompassing religious antagonisms, ethnic animosities, ideological disparities, and conflicting national interests. Coupled with the intervention and propulsion of international forces, Middle Eastern countries have frequently erupted into armed conflicts and large-scale wars, such as the five Middle Eastern wars and the Iran-Iraq War. These disruptions have often halted the region's modernization process, with some countries even experiencing significant decline. Under the influence of these uncertainties, the Middle East has consistently been unable to focus on its nation-building, causing its development to lag behind the mainstream trends of modern human civilization.

In recent years, a focus on state development has emerged as a governance consensus among Middle Eastern nations. This shift is evident in the policy documents of various countries. Regional powers like Turkey, Egypt, Saudi Arabia, and Iran have all rolled out medium-to-long-term development plans, prioritizing industrial construction and technological advancement. The pivot in the governance focus of these regional heavyweights indicates a transformation in the primary contradictions of the Middle East.

3.2 Reconciliation and Cooperation as the Trend in State Relations

Following the "Arab Spring," multiple power centers emerged in the Middle East, such as the "Traditional Islamic Alliance," "Pro-Muslim Brotherhood Alliance," "Shiite Resistance Alliance," and "Moderate Alliance," among others.[17] These factions viewed each other with suspicion, engaging in intense rivalries across various domains, plunging the Middle East into fragmentation and disorder. The Middle East also remains the least integrated region globally.[18]

However, since 2021, confrontations between these regional blocs have eased, and the warming of multilateral relations has accelerated. This trend is evident in three aspects. First is the reconciliation among the three major camps: Turkey, Israel, and the Arab nations. In 2022, Turkish President Erdoğan visited the UAE and Saudi Arabia, followed by a return visit by Saudi Crown Prince Salman to Turkey. Turkey also normalized relations with Egypt in 2023. The same year, Israeli President Herzog visited Turkey, with high-level discussions taking place at the UN General Assembly in September. Moreover, following the 2020 "Abraham Accords," the 2022 "Negev Forum" further enhanced relations between Israel and Arab nations. These diplomatic moves indicate a steady warming of tripartite relations. Second is the reconciliation between Iran and the Arab world. In 2022, Kuwait and the UAE resumed ambassadorial diplomatic relations with Iran, and Saudi Arabia initiated talks with Iran. In 2023, with China's efforts, the two countries issued a joint statement agreeing to restore diplomatic relations. By September of the same year, both nations exchanged ambassadors, marking a historic reconciliation between the two major camps.[19] Relations between Iran and other countries like the UAE and Bahrain also gradually improved. Third is the internal reconciliation among Arab nations. Long-standing divisions, such as pro-US vs. anti-US, pro-Muslim Brotherhood vs. anti-Muslim Brotherhood, and pro-Iran vs. anti-Iran, have prevented the Arab world from forming a stable consensus. However, with Saudi Arabia's announcement of restoring diplomatic ties with Syria, the Arab world is attempting to reintegrate Syria. The active assistance and "earthquake diplomacy" during Syria's 2023 earthquake further attest to this.

3.3 Seeking Autonomy Becomes a Regional Consensus

The notion of global multipolarity is becoming a consensus among the elite in Middle Eastern countries.[19] The balance of international power is undergoing profound changes, with the rise of emerging market countries and developing nations. No longer can one or a few nations dominate international affairs; instead, multiple influential nations and blocs have emerged. This multipolar trend provides medium-sized countries and regional alliances with greater strategic flexibility, allowing them to exert more significant international influence. Due to their geographical location and energy resources, Middle Eastern countries possess the capital to seek international strategic autonomy.

This regional consciousness is first reflected in their foreign policies. Middle Eastern countries actively seek cooperation with various political forces, aiming to build a global partnership network. For instance, while Saudi Arabia maintains its alliance with the US, it is also expanding cooperation channels with countries like Russia, China, and India. In 2023, Iran joined the Shanghai Cooperation Organization, and some Middle Eastern countries even joined the BRICS nations. These examples indicate that Middle Eastern countries are trying to reshape the international order by strengthening cooperation with various political forces.

The pursuit of regional autonomy is also evident in the struggle for discourse power in areas of advantage. For example, during the Russo-Ukrainian conflict, Middle Eastern countries, leveraging the "OPEC+" organizational framework and acting from regional interests, formulated energy policies and repeatedly rejected US requests for increased oil production. This not only reflects these countries' growing discourse power in the oil sector but also their determination to uphold regional autonomy. Furthermore, Middle

Eastern countries are not solely relying on the traditional oil industry; they are actively promoting the transition to new energy industries, aiming to secure a more advantageous position in the global economic industrial chain.

4. Dissolution and Reconstruction of Balance in the Middle East

4.1 The Israel-Palestine Conflict: The Catalyst for the Collapse of Balance

If the rise of the reconciliation trend and the sense of autonomy are seen as the maintenance and improvement of the balance in the Middle East, then the recent resurgence of the Israel-Palestine conflict is becoming the starting point for the collapse of this balanced structure. This conflict is a complex one, triggered by a combination of religious, ethnic, territorial, and political factors. It involves Israel, Palestine, and other Arab nations, and also affects the interests and influence of major powers like the United States and Russia. The immediate spark for this conflict was a series of actions by Israel in Jerusalem, including the eviction of Palestinian residents from East Jerusalem and restrictions on Palestinians visiting the Temple Mount for prayers during Ramadan, leading to strong protests and resistance from the Palestinians. The Palestinian militant group Hamas launched a military operation codenamed “Al-Aqsa Flood” on October 7, 2023, firing over 5,000 rockets at Israel and sending armed personnel into southern Israeli territory, capturing several Israeli Defense Forces generals. In response, Israel conducted extensive airstrikes and artillery shelling on the Gaza Strip, destroying Hamas’s command centers, tunnels, and weapon caches, and declared a “state of war.”

While the United States attempted to mediate between the conflicting parties immediately, its diplomatic efforts seem to have been ineffective so far. The international community’s efforts for peace also couldn’t deter Israel’s determination for retaliation. For Hamas, under the long-term pressure from Israel, its resolve for armed resistance is unwavering. As for Israel, the current government is historically the most hardline right-wing administration, and the domestic political and social environment is far from peaceful. This intense military action serves dual purposes: on one hand, it aims to weaken Hamas’s military capabilities and political influence, showcasing to the international community its firm stance and determination; on the other hand, it helps the ruling government divert domestic political crises and societal divisions, thereby consolidating its rule and legitimacy. Therefore, at present, neither side seems to have a strong desire or motive for a ceasefire. However, the escalation of this conflict could lead to structural changes in the previously stable balance of the entire Middle East region.

4.2 A Microcosm of the Global Balance of Power

In the wake of the Russia-Ukraine conflict, the world has witnessed an intensified jostling for power among global giants. This escalation has transformed the Middle East into a veritable “chessboard” for geopolitical maneuvering. Here, the intricate dance of power sees China and the U.S. locked in a technological duel, Russia and the EU wrestling over energy supremacy, and the U.S. and Russia in a tug-of-war for strategic allies. This evolving dynamic in the Middle East is not an isolated phenomenon but a reflection of broader tectonic shifts in the global balance of power.

The Middle East holds a dual significance in the global arena. On one hand, it is pivotal to China’s ambitious “Belt and Road” initiative, aiming to reshape global trade routes. On the other, it remains the linchpin of the U.S. “petrodollar” system, a cornerstone of global finance. Moreover, the volatility of the Middle East has direct ramifications for the Russia-Ukraine conflict, underscoring the region’s interconnectedness with global geopolitics. It is, therefore, an academic and policy imperative to recognize that any destabilization in the Middle East could trigger a cascade of upheavals in the international order.

Despite recent diplomatic overtures between Arab nations and Israel, the simmering Israel-Palestine conflict presents a formidable challenge to regional stability.[20] At its core, the Palestinian issue encapsulates the age-old territorial contestation between the Arab and Jewish communities. This struggle, steeped in layers of ethnic, religious, and geopolitical complexities, remains a festering wound in the collective consciousness of both groups. Israel's historical stance of armed dominance over the Palestinians has exacerbated these tensions, with each act further entrenching mutual distrust and animosity. The recent flare-up in hostilities has pushed many in the Arab world to their psychological brink, amplifying the urgency for a resolution. An unchecked escalation from Israel could very well be the catalyst for a broader Middle Eastern conflagration.

The potential for a full-blown war in the Middle East carries with it profound global implications. The most immediate concern would be its impact on the Russia-Ukraine conflict. Western nations, already stretched thin in their support for Ukraine, might find their resources further strained. The U.S.'s decision to reallocate aid from Ukraine to Israel is a testament to this delicate balancing act. Such recalibrations could be decisive in shaping the outcome of the Russia-Ukraine standoff. Furthermore, the global strategies of powerhouse nations would be significantly affected. Both China's "Belt and Road" vision and the U.S.'s Middle East blueprint hinge on the region's stability. While global powers possess the agility to recalibrate their strategies, the Middle East's centrality cannot be understated. The U.S., given its deep-seated ties with Israel, is bound to prioritize its support, even if it means diluting its focus in other strategic areas like the Asia-Pacific. This could inadvertently create vacuums, allowing rival powers greater latitude, and potentially reshaping global power dynamics.

4.3 Trends and Characteristics of Changes in the Middle East

The Middle East, a region historically characterized by its intricate web of geopolitical dynamics, is currently undergoing significant transformations. These changes, while rooted in historical contexts, are also reflective of the broader shifts in the global political landscape. To understand the future trajectory of the region, it's essential to delve into the key trends and characteristics shaping its present and future.

Firstly, there's an emerging trend of reconciliation in the Middle East. This is not merely a fleeting sentiment but a strategic imperative. The majority of countries in the region recognize that a return to a pervasive state of conflict is detrimental to their national interests. The emphasis on development, both socio-economic and political, has become a shared vision among these nations. The initial successes, albeit modest, have been encouraging. This positive momentum underscores the idea that reigniting large-scale conflicts is not the preferred choice for most governments. The relatively swift response of the Arab world to the recent Israel-Palestine conflict is a testament to this. The nature and intensity of this conflict, and more importantly, its resolution, will be contingent on Israel's strategic calculus. Will Israel perceive this as an all-out war, or will it opt for calibrated, targeted strikes against specific entities?

Secondly, as the global order undergoes a phase of restructuring, Middle Eastern countries find themselves at a crossroads. The Israel-Palestine conflict, while regional in its scope, has broader implications, signaling a disruption in the global balance of power. For Middle Eastern nations to navigate this new world order effectively and to maximize their developmental prospects, they must adopt a proactive stance. This involves not only understanding their individual national interests but also conceptualizing the Middle East as a cohesive geopolitical entity. Establishing a unified regional identity will be instrumental in amplifying their collective voice on the global stage, thereby enhancing their influence in international affairs.

Lastly, the unfolding dynamics of the Israel-Palestine conflict serve as a barometer for the broader Middle Eastern trajectory. Israel's current actions, perceived by many as provocative, are treading on the sensitive spiritual and cultural ethos of the Islamic world. Symbolic gestures, such as the raising of black flags in

Iran and red flags in Syria, are emblematic of the simmering discontent and anger among Muslims. Yet, it's crucial to recognize the nuanced nature of this sentiment. While there's palpable anger, it doesn't necessarily translate into a unanimous call for large-scale warfare. The Islamic world, diverse in its political, cultural, and socio-economic fabric, is grappling with this complex interplay of power and sentiment. The eventual direction of the Israel-Palestine conflict, and by extension, the broader Middle East, remains shrouded in uncertainty.

In conclusion, the Middle East stands at a pivotal juncture. The choices made by its nations, individually and collectively, will have profound implications, not just for the region but for the global order. As scholars and policymakers grapple with these complexities, a nuanced, informed, and empathetic understanding of the region's dynamics will be paramount.

5. Conclusion and discussion

The Middle East, often described as the world's geopolitical epicenter, stands at a pivotal juncture. Its trajectory is shaped by a complex interplay of socio-political, economic, and geopolitical factors. While the region's historical and cultural richness offers a tapestry of opportunities, its present is marked by a series of challenges that threaten its future stability and prosperity. In the broader discourse of international relations and global politics, the Middle East's development narrative underscores the necessity of cooperative, win-win solutions. Yet, the contemporary landscape, riddled with multifaceted risks, casts a shadow over the prospects of lasting peace and sustainable development.

5.1 The Looming Shadow of Security Risks

At the forefront of these challenges is the escalating security dilemma. The region, historically a cauldron of conflicts, is witnessing a resurgence of tensions, with the specter of war looming larger than ever. The intricate web of alliances and rivalries, coupled with external interventions, has created a volatile environment. The ramifications of this heightened security risk are profound. Beyond the immediate human cost, prolonged instability could derail the region's developmental trajectory, pushing it into a quagmire of stagnation or, worse, regression. The international community, therefore, faces a moral and strategic imperative to prevent further escalation and foster an environment conducive to dialogue and diplomacy.

5.2 Economic Challenges: The Underbelly of the Middle Eastern Mirage

Parallel to the security concerns is the region's economic conundrum. Economic development is not uniform across the countries of the Middle East (Table 1). Despite its vast natural resources, particularly oil, the Middle East grapples with deep-seated structural economic issues. The dual challenges of diversifying economies away from oil-dependence and navigating the complexities of the global economic order have exacerbated existing problems. Countries are feeling the pinch of fiscal pressures, and the path to industrial transformation is fraught with obstacles. This economic quagmire manifests in stark wealth disparities, alarmingly high unemployment rates, and pervasive corruption. Such economic fragility, if left unaddressed, could further fuel social unrest and political instability, casting a pall over the region's future prospects.

Table 1 GDP status of major Middle Eastern countries in 2022

Countries	GDP ranking for 2022	GDP proportion among major Middle	Total GDP in 2022 (in billions

		Eastern countries in 2022	of US dollars)
Saudi Arabia	1	23.05%	1108.15
Turkish	2	18.83%	905.53
Israel	3	10.87%	522.53
United Arab Emirates	4	10.55%	507.54
Egypt	5	9.88%	475.23
Iran	6	7.32%	352.21
Iraq	7	5.62%	270.36
Qatar	8	4.69%	225.48
Kuwait	9	3.84%	184.56
Oman	10	2.38%	114.67
Jordan	11	1.02%	48.84
Bahrain	12	0.92%	44.39
Cyprus	13	0.59%	28.47
Yemen	14	0.43%	20.65

Data source: IMF and China Caitong Securities Research Institute

5.3 Geopolitical Chessboard: The Great Game Redux

Lastly, the Middle East remains a theater for the grand geopolitical game, with major powers jockeying for influence. Issues such as the Yemeni crisis or the simmering tensions between Iran and Azerbaijan are not isolated incidents but symptomatic of a larger geopolitical contest. These rivalries, often exacerbated by external interventions, threaten to undermine regional cohesion. The Middle East's historical legacy as a battleground for empires serves as a somber reminder of the perils of external meddling. Unless there's a concerted effort to address these geopolitical tensions within a regional framework, the vision of a peaceful, integrated Middle East remains elusive.

5.4 In Summation

The Middle East's challenges, while daunting, are not insurmountable. The region's rich history is a testament to its resilience and adaptability. However, the current confluence of security, economic, and geopolitical challenges necessitate a reimagining of strategies and approaches. Cooperative endeavors, rooted in mutual respect and understanding, offer the best path forward. The international community, regional powers, and local stakeholders must come together, transcending narrow interests, to chart a course towards a peaceful and prosperous Middle East. The stakes, both for the region and the world, are too high to settle for anything less.

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Neo-Colonialism in Africa: France's Ongoing Policy Influence and Its Impact on African Autonomy

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KEYWORDS

Military coup d'état;
Françafrique；
France's neo-colonialist tactics;
Sub-Saharan Africa

ABSTRACT

In the wake of the Second World War, a wave of decolonization movements and national independence swept across the globe, and the former French colonies in Africa became independent in the following two decades, which at the same time marked the collapse of the French colonial empire. However, French influence persisted on this huge continent and continued to be felt in varied ways throughout Africa, particularly in West Africa and the Sahel region. In recent years, the fall of pro-French Governments in France's former African colonies has demonstrated the negative impact of its African policy on those countries, leading to a rise in the will of the African people to fight for genuine autonomy. This study aims to demonstrate how France continues to exert its influence over its former African colonies through a variety of means, including resource looting, financial control, and military presence, in order to realize its neo-colonialist strategy and ultimately reap beneficial results. This study also demonstrates a rational assessment of the decline of French influence in Africa and the presence of other world powers in Africa, as well as a hopeful view of the future of Africa's struggle for true independence and autonomy.

1. Introduction

While the Russo-Ukrainian War seems to be descending into an interminable and protracted war, the military coup d'état in the Republic of Niger, a former French colony in West Africa, which resulted in President Mohamed Bazoum being detained by his guards and placed under house arrest as well as the occupation of state television by Niger soldiers to declare the victory of this military coup d'état, has recently drawn attention to the African continent, which has previously received relatively little exposure. [1] At the same time, France took a strong stand against the coup d'état, with President Macron declaring that he would defend French interests in the Niger and ECOWAS （Economic Community of West African States） threatening military intervention in the Niger. While Mali, Burkina Faso and Algeria, have proclaimed their support for the coup d'état and declared that any external military intervention in Niger would be tantamount to a threat to them, the situation has appeared to be spiraling out of control for a time. This coup d'état, which took place in the region of the world where coup d'états occur most frequently, appears to be just another struggle for power, but it is actually a revolution and a fight against France's neo-colonialist tactics. Neocolonialism was introduced in 1956 to describe the special economic and cultural relationship between European countries and their former colonies after the Second World War. [2] In the 1960s, neo-colonialism was used by the Ghanaian politician Kwame Nkrumah in the context of the decolonization movement in Africa. Neocolonialism is different from the traditional colonial strategy in that it controls a country and influences its political situation by economic means, cultural means, or "conditional assistance" rather than by using military force to conquer a nation. However, the slight difference in France's neo-colonial strategy is that it keeps a military presence in its former colonies in Africa through "Military Collaboration" or "Counter-Terrorism," while it maintains economic control over them through the circulation of the West African franc and the Central African franc as well as the exploitation of their mineral resources.

The military coup d'état in Niger in July was not an isolated incident; in fact, it was the eleventh coup d'état to take place in the Sahel region—also known as the "Coup d'état Belt"—since 2020. Actually, more coup d'états have occurred in French-speaking nations than in English-speaking ones in West Africa and the Sahel region， since 1990, accounting for 78% of the region's 27 coup d'états. [3] This raises the question of what France brought to these former colonies that has led to the current situation. The French presence in Africa has a long history. As early as the 17th century, the First French Colonial Empire established its first trading post in Senegal in West Africa, and in the following 18th and 19th centuries, the French colonial empire's territory in Africa was dramatically exaggerated, occupying a large amount of land in North Africa, West Africa and Central Africa, making it the largest occupier of colonial territory in Africa. In the aftermath of World War II, many of France's African colonies achieved independence during the decolonization movement and wave of national independence. [4] At first glance, it looked like that France had lost many of its colonies, and many Africans rejoiced in their countries' newly found freedom. True independence, though, remained elusive. Through a variety of tactics, France continued to impose control over Africa, creating the special and intricate "Françafrique" relationship. The word "Françafrique", which is composed of the words "France" and "Africa" in French, is used to describe the "close" relationship between France and its former African colonies. This "close" relationship has objectively brought economic and industrial progress to France's former colonies in Africa, as Félix Houphouët-Boigny, the first President of Côte d'Ivoire, used the term in recognition of France's positive role in the economic growth and political stability of Côte d'Ivoire. [5] But as it has become increasingly clear that France's negative impact on African countries outweighs its positive impact, the term "Françafrique" is now being used to criticize the "neo-colonialism" that France has imposed on its former colonies in Africa. The word "Françafrique" in the study of international relations can be defined as "France's political and economic influence to make Africa its sphere of influence or backyard", according to Maja Bovcon, a specialist in West African analysis. Based on a French linguistic interpretation, the word is made up of the adjective "Français" and the noun "Afrique"， with "Français" denoting "French or France's". Thus, the literal translation of the word "Françafrique" can be "France's Africa," which is close to Maja Bovcon's interpretation from an international relations perspective.

2. France's neo-colonialist tactics in Africa

2.1 Resource Looting

The French resource plundering of West Africa today is focused on the robbery of natural resources, natural uranium is a perfect illustration for this case, as opposed to the colonial-era pillage of Africa's demographic resources. As the world's second-largest producer of nuclear power, France relies on nuclear energy for 70.6% of its electricity production. To maintain its nuclear power plants, France requires approximately 8,000 tons of natural uranium annually. Additionally, as one of the few nuclear-armed nations, uranium resources also hold significant military significance for the French military. [6] Therefore, natural uranium plays an indispensable role in both France's civilian and military nuclear sectors. Niger, which produces 4.7% of the world's natural uranium, comes in third place behind Kazakhstan and Australia in 2021. In 2022, Niger provided natural uranium for over 103 nuclear reactors in 13 EU Member States, making it the second-largest natural uranium supplier to the EU. At the same time, Niger is the third largest natural uranium supplier to France between 2005 and 2020, meeting 19% of its demand for 56 nuclear reactors and 18 nuclear power plants.

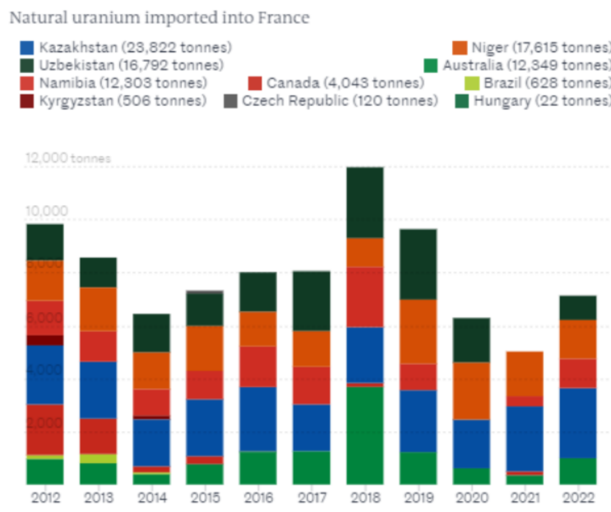


Figure 1 Natural uranium imported into France from 2012-2022. Technical Committee Euratom

Despite having made a substantial contribution to France's nuclear energy development, Niger receives little in return, with about 85% of the country's people still lacking access to electricity, and only 12% of the proceeds from uranium exports going back to Niger. Additionally, the uranium mining industry in Niger generates sizable profits for Orano, the French nuclear energy group that is more than 90% state-owned, which owns more than 59% of three mines in the north of the nation: The Aïr mines, The Akokan mining site, and the Imouraren mine. According to a 2013 report by Oxfam, Niger gave the French organization Orano around 30% of the uranium it required, but Orano only paid Niger 7% of the total. Through negotiations with the Niger government, the corporation also obtained tax breaks worth tens of millions of euros. According to estimates, France, the main purchaser of natural uranium from Niger, purchases the uranium annually for an amount that is significantly less than market value — equal to 0.8 €/kg—while purchasing natural uranium from Canada for an amount that is comparable to 200 €/kg. [7] As one of the world's least developed countries and one of the poorest, with nearly 60% of its population living on less than 1$ a day, Niger is ranked at the bottom of the United Nations Human Development Index, and the plundering of natural uranium, the Niger's main export, by France, has exacerbated the economic situation of this poorest of countries.

Niger is not the only country whose resources are being exploited by France. Gabon is the world's second largest producer of manganese after South Africa, and the French mining group Eramet has been present in Gabon for decades, its subsidiary Comilog extracting 90% of Gabon's manganese thanks to the world's largest manganese mine - Moanda mines. Manganese is widely used in electric vehicle batteries, and it has been listed by the European Commission as one of the 23 key raw materials for the energy transition. [8] African countries are rich in natural resources, while France is highly dependent on African raw materials such as cobalt, uranium, copper, manganese, phosphate and bauxite. The import of these raw materials from Africa is essential for the development and operation of France's high-tech industries, aerospace, nuclear energy and weapons.... France's mining investments in Africa cover a number of countries, such as Gabon, Mali, the Democratic Republic of the Congo (DRC), etc. France's mining investments in Africa are also a major source of raw materials for the development and operation of its high-tech industries. French companies are also engaged in oil and gas extraction activities in several African countries. TotalEnergies, a giant French energy company, is present in Niger, Cameroon, Congo-Brazzaville and Côte d'Ivoire. France has invested heavily in the energy sector in these countries to access energy resources.

In 2018, the World Bank published a figure of Adjusted Net Saving (ANS) for all regions of the world. [9] ANS measures the true rate of saving in an economy after taking into account investments in human capital, depletion of natural resources and damages caused by pollution. Adjusted net saving, known informally as genuine saving, is an indicator that aims to assess an economy’s sustainability based on the concepts of extended national accounts. If a country's net savings are positive and the accounting includes a sufficiently broad range of assets, economic theory suggests that the present value of social welfare is increasing. Conversely, persistently negative adjusted net savings indicate that an economy is on an unsustainable path. [10] Sub-Saharan Africa is the only region in the world where the ANS is negative, the World Bank concludes that Sub-Saharan Africa loses roughly $100 billion of ANS annually. Although the depletion of natural resources is not the only indicator affecting the ANS, it is clear that natural resource depletion is one of the key factors in the negativity of the ANS in sub-Saharan Africa, a region rich in natural resources. The large-scale exploitation of natural resources by multinational corporations in the region is obviously not the right path for the sustainable economic development of the sub-Saharan Africa region. These multinational energy companies often include French energy companies.

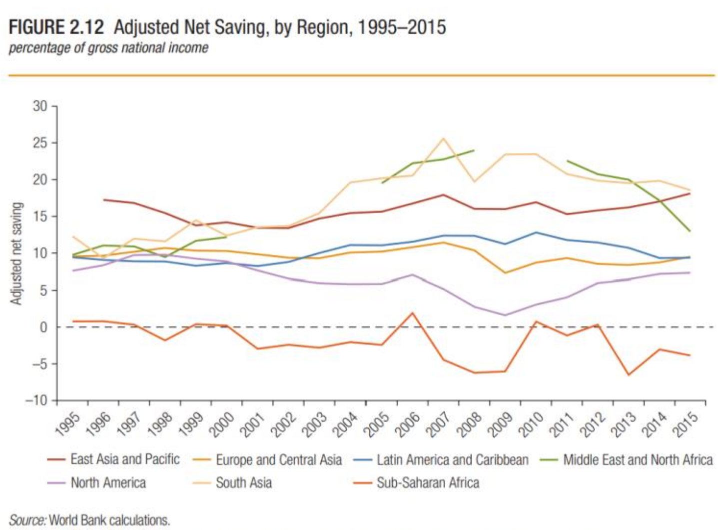


Figure 2 Adjusted Net Saving, by Region, 1995-2015, percentage of gross national income. World Bank calculations. (2018)

2.2 Financial Control

In addition to the plundering of Niger's uranium resources, France's economic plundering of Niger is also reflected in its fiscal and monetary policies. Niger, along with seven other West African countries, is part of the West African Economic and Monetary Union (UEMOA) and uses the CFA franc as its currency. The CFA franc is pegged to the euro at a fixed exchange rate set by France and guaranteed by the French government. However, the French Ministry of Finance controls the issuance and printing of the CFA franc, the nations that use the currency pay a mint tax to France, 50% of the UEMOA's foreign exchange reserves must be held at the French central bank, and there is a sizable French presence on the central bank boards of West African nations. Therefore, despite appearing to be jointly managed by France and the central banks of West African nations, the West African franc's monetary system is in fact under France's de facto authority. UEMOA lacks monetary autonomy and the authority to issue additional currency, which makes it difficult for the governments to make loans and causes the economy to expand slowly. In addition, these countries have no control over the price of its currency and is unable to use the exchange rate to control the currency in the case of a financial crisis. Despite the obvious drawbacks, what is worse is that it seems difficult for these countries to move away from this currency. The Economic Community of West African States (ECOWAS), which consists of 15 countries in West Africa (including UEMOA), announced plans to introduce the ECO currency in 2020. However, due to the epidemic and other circumstances, in 2021, ECOWAS member states decided at a summit that the ECO currency would not be introduced until 2027. Some economists have analyzed that one of the major influencing factors is the failure of the economic situation of the member countries to meet the convergence criteria. According to Macroeconomic Convergence Criteria Adopted by The Authority of ECOWAS Heads of State and Governments in 2015, member states are required to fulfill the following criteria to ensure macroeconomic stability when the single currency is issued.

Primary Criteria [11]

（1）Ration of Budget deficit (commitment basis, including grants) to GDP: lower than or equal to 3% of GDP.

（2）Average annual inflation rate: less than 10% in short term ad 5% as from 31st December 2019.

（3）Central Bank financing of Budget Deficit: less than or equal to 10% of previous year’s tax revenue.

（4）Gross external reserves: greater than or equal to three months of imports cover.

Secondary Criteria

（1）Nominal exchange rate variation: (+/- 10%).

（2）Public debt to GDP ratio: less than or equal to 70%.

But unfortunately, until 2017, the ECOWAS member states did not reach the mentioned criteria. It is worth to note that the adoption of the CFA franc by West African nations decreases the risk of inflation, avoids significant exchange rate swings, and is objectively favorable to the stability of the region's economies and currencies. [12] From the standpoint of global trade, the peg between the CFA franc and the Euro can ensure merchants' faith in this currency, which promotes international trade and commercial cooperation. If ECOWAS members use the single currency ECO, which is not pegged to the euro, how will the ECO safeguard exchange rate stability, secure traders' confidence in this new currency, and win international backing? [13] [14] [15] All of these are worthwhile issues to consider. In addition to these difficulties, France's opposition to UEMOA member states participating in the ECO currency may be another reason why the single currency may not be introduced in 2020. [16] According to economist Séraphin Prao, the execution of this project was somewhat hampered by Macron's trip to Côte d'Ivoire in 2019.

CRITERIA	TARGET	2011	2012	2013	2014	2015	2016	2017	2018*
Primary Criteria									
Ratio of Budget deficit (including grants on commitment basis, including grants)	≤3%	9	6	9	6	6	3	7	5
Average annual inflation rate	≤10%	12	12	12	14	14	12	11	11
Central Bank financing of the Budget Deficit	≥10%	12	13	14	13	12	13	12	15
Gross external reserves	≥3	14	13	13	14	12	13	14	14
Secondary Criteria									
Nominal exchange rate variation	±10%	13	14	14	13	13	12	12	13
Ratio of Public debt to GDP	≤70%	13	13	13	11	11	11	12	11

Figure 3 Number of Countries that Met the Covergence Criteria in ECOWAS. WEST AFRICAN MONETARY AGENCY (2017)

2.3 Military Presence

The French military presence on the African continent has a long history, as many French soldiers came to the continent during the colonial era to fight for the motherland and to open up colonies. Between 1960 and 2013, France conducted 31 military operations in Africa, all of them in Francophone countries. Between 1960 and 1994, France signed military agreements with 27 African countries, [17] [18]and these military interventions and agreements have played an important role in protecting France's economic and political interests on the continent, especially by keeping unpopular pro-French leaders in power. Today, the Sahel region, which is plagued by extreme poverty, backwardness, and regional conflicts, is a breeding ground for terrorism. France started military operations in 2012 and 2014 with the names "Operation Serval" and "Operation Barkhane" to combat terrorism. Armed forces were sent to the Sahel region to cooperate with the G5 Sahel in the fight against terrorism. Nevertheless, after years of counterterrorism operations, the French military has not made much headway, and if anything, the threat of terrorism has grown. Significant criticism has also been leveled at these efforts. The Minister of State of Burkina Faso, Bassolma Bazie, in his recent speech to the United Nations General Assembly, had suspected that the terrorist forces in the Sahel region were being financed by external forces such as France and the United States, and had continued to maintain a military presence in the region on the pretext of counterterrorism. [19]

However, as anti-French sentiment rises and the people of West Africa's desire for true independence and freedom increase, France has experienced significant defeats in the Sahel region in recent years. France left Mali, Burkina Faso, and the Central African Republic between 2022 and early 2023 as a result of anti-French regimes taking control in the Sahel countries and widespread protests. And on 24 September, two months after the military coup d'état in Niger, French President Macron announced that he would recall his ambassador in Niger and withdraw the 1,500 French troops in Niger to their homeland before the end of the year. As a result, only 1,000 French troops in Chad remain in the Sahel. But the withdrawal of French troops did not mean the complete disappearance of French military forces in Africa, in this continent, France still has five military bases, a total of 3,820 military combatants, and a small number of troops to participate in the European Union's operations in Africa and the United Nations peacekeeping missions. The presence of French troops on the African continent not only allows France to protect its expatriates but also gives it the ability to intervene at any time and in any place to defend its interests in Africa as well as to continue to expand its influence. [20] In his address to the United Nations General Assembly, Bassolma Bazie also stated that one of the primary causes of the high number of coup d'états on the continent is the influence of certain nations and organizations that plunder resources, promote poor governance, and cultivate proxies in Africa, resulting in corrupt and ineffective governments and the suffering of the people. He added that " Coup d'états are just a result, and if we eradicate the causes, so will the results diminish."

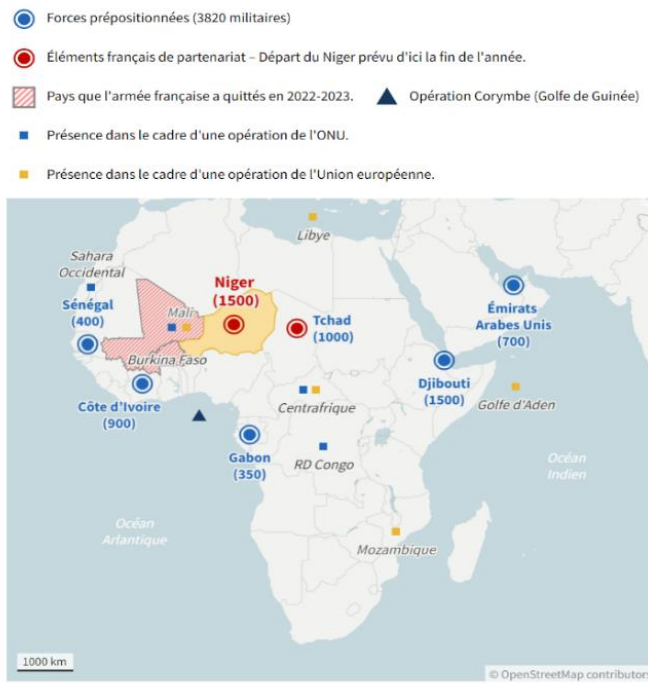
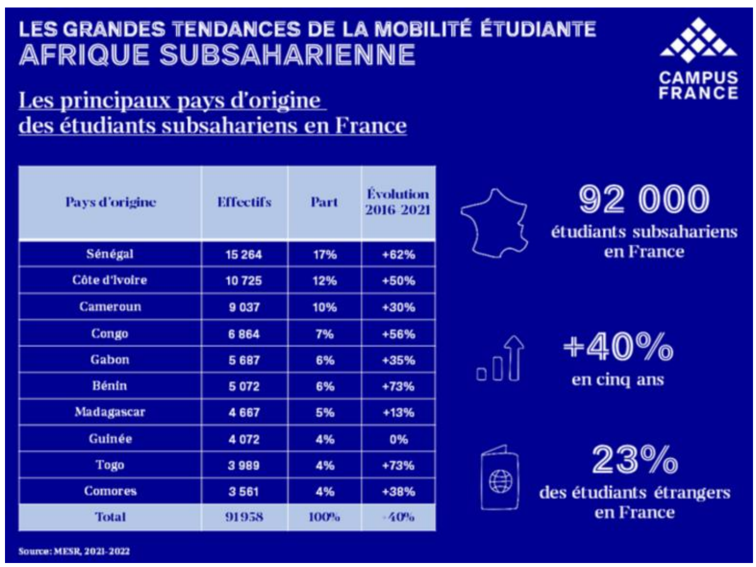


Figure 4 French military presence in Africa until 25 September 2023. French Ministry of Defence (2023)

3. Other factors

The loss of labour and talent is also one of the reasons why Africa has long struggled to develop. In the days of the slave trade, many Africans came to France as slaves. In World War II, the French Army of Africa contributed to the liberation of French soil and the victory of the Allied Forces, and many Africans were sacrificed as a result. After World War II, due to the high casualties caused by the war, the French government introduced many labour force from Africa for the needs of economic construction and national reconstruction, and many Africans from French colonies left their lands to work and participate in the reconstruction of France. However, in modern times, France's attraction to the talent and labour force of its former African colonial countries is mainly through its cultural and linguistic appeal. Because the official language of most of France's former African colonies is French, and the education system is also influenced by France, young people from France's former African colonies are more likely to choose to study and work in France, and are more likely to integrate into French society, and as a result, France has gained access to a relatively high-quality talent and labor force, whereas West African countries are facing a loss of talent and labor force. A number released by Campus France in 2022 indicated that, for a considerable amount of time, France has continued to hold its place as the preferred study destination for sub-Saharan African countries. In 2021–2022, 92,000 international students from these countries studied in France, a 40% increase over the previous five years.

As for the political dimension, France is often criticized for undermining the sovereignty of other countries through its influence. After the end of the Cold War, France used its aid policy to Africa as a foreign policy tool to change the political systems of certain African countries, and the most important principle of France's aid policy to Africa was based on the protection of France's economic interests, and France would consequently support a number of pro-French authoritarian governments and corrupt leaders. France provided military, technical and financial support to the Hutu Government during the 1994 Rwandan genocide, an act that tarnished its image both in Africa and in the international community. In recent years, President Macron wants to improve France's reputation in Africa, he is looking to develop a new narrative to improve France's relations with its former African colonies, and making efforts in the areas of economic, historical memory, and aid. But Macron's ideas have been constrained by some historical factors, France's internal political and decision-making structures, resulting in a rapid turnaround of France's policy in Africa that remains uncertain.



Pays d'origine	Effectifs	Part	Évolution 2016-2021
Sénégal	15 264	17%	+62%
Côte d'Ivoire	10 725	12%	+50%
Cameroun	9 037	10%	+30%
Congo	6 864	7%	+56%
Gabon	5 687	6%	+35%
Bénin	5 072	6%	+73%
Madagascar	4 667	5%	+13%
Guinée	4 072	4%	0%
Togo	3 989	4%	+73%
Comores	3 561	4%	+38%
Total	91958	100%	+40%

Figure 5 The major trends in Sub-Saharan African student mobility. French higher education and research ministry (2021-2022)

4. Other players

Niger, Mali, and Burkina Faso signed a charter in the Malian city of Bamako shortly after the military coup d'état in Niger. The charter established a defense alliance and decided to form the Alliance of Sahel States with the goals of battling terrorism, organized crime, and common defense. This resulted in the formation of a "coalition against France" in West Africa as well as the dissolution of the G5 Sahel, which had been established in 2014. With the withdrawal of French troops and the sharp decline of French influence in the region, there is every indication that the region has come under the influence of the Russian Wagner Group, which seems to be behind the military coup d'états in all three countries of the Alliance of Sahel States. As Russia's agent in Africa, the Wagner Group, which operates mainly in Mali, the Central African Republic and Sudan, provides military combat support, security and military training services to its African clients. In return, the Wagner Group receives cash payments or resource concessions, such as logging rights and control of the gold mine. [21] Russia's influence on the African continent is not a recent phenomenon. During the Cold War, the Soviet Union used the African continent as the stage for its great power influence, portraying itself as the liberator of African nations so as to help them to get rid of the influence of European colonizers, and as a result, some African people saw the USSR as a much more attractive partner to work with than the West. [22] To this day, the pro-Russian wave in Africa still exists, with two polls by Premise Data in August 2023 showing that Russia is trusted highly in a number of African countries, with more than 60% of the population in Niger identifying Russia as the most trustworthy country, while in Mali the figure is up to 71%. Against the backdrop of the Russian-Ukrainian war, Russia's rift with the West has grown deeper and deeper, and in order to break the West's diplomatic isolation, Russia has taken steps to continue to expand its influence in Africa to gain more diplomatic support at the United Nations. [23] At the second Russia-Africa Summit, the leaders of Burkina Faso and Mali declared their support for Russia's special military operation against Ukraine and the President of the Central African Republic said that the Russia-African Summit provides an opportunity for African countries to resist the hegemony of certain countries.

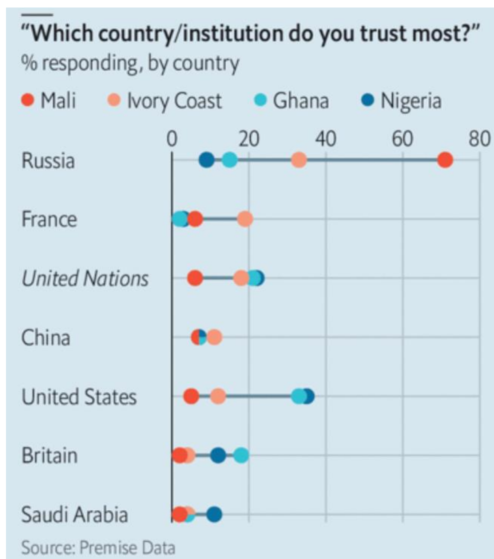


Figure 6 "Which country/institution do you trust most?", by West African country(in%). Premise Data(2023)

In addition to Russia and France, the African continent is also a stage for the demonstration of the influence of other world powers, with China and the United States continuing to exert different influences on this vast continent at the same time. [24] China's influence in Africa has been demonstrated mainly through economic and trade cooperation and infrastructure construction. As early as the 1960s, China assisted Zambia and Tanzania in the construction of railroads. Between 2000 and 2020, China provided help to African nations in the construction of more than 13,000 km of railways, almost 100,000 km of highways, around 1,000 bridges, nearly 100 ports, and more than 80 large-scale power plants. [25] As for trade, China has held the position of Africa's largest trading partner for 14 consecutive years, with China-Africa trade hitting a record $282 billion in 2022, a 16.6% increase from 2021. In 2022, China's exports and imports to and from African countries all grew by more than 11% compared to 2021Despite the fact that China's aid to Africa is not tied to any political conditions, there are still Western politicians who believe that Africa is falling into China's debt trap. [26] China denies this view and argues that China is dedicated to helping Africa get out of poverty. In 2023, a study by the CHINA AFRICA RESEARCH INITIATIVE at Johns Hopkins University in the United States of America showed that China was an active participant in the G20

Debt Relief Initiative, contributing up to 63% of the debt relief, and that China had contributed greatly to helping restructure the heavy debt burdens of some African countries. [27] [28]

Different from China, the United States, in addition to various economic and trade exchanges with Africa, has deployed 29 military bases in 15 African countries, with a garrison of about 6,000 troops, of which 13 are enduring bases and 16 are non-enduring bases. [29] [30]The African countries in which U.S. troops are stationed are mainly concentrated in East Africa and West Africa. It is undeniable that the presence of U.S. troops on the African continent, where terrorism is rampant, has played a positive role in combating terrorists, but the presence of U.S. troops on the continent must have its own geopolitical considerations. For example, U.S. military bases in East Africa can join those in the Middle East and the Mediterranean, giving the United States the ability to intervene at any time in the recently erupted Israeli-Palestinian war. The U.S.'s ability to quickly intervene in regional affairs and project capabilities to protect its own interests is made possible by the presence of American troops in Africa, but this interventionism also raises questions about potential interference with the sovereignty of African nations.

5. Conclusion

The African continent has indeed become a platform for major world powers to showcase their economic and military strength, as well as to compare the merits and drawbacks of their foreign policies. France's neo-colonial strategy, characterized by various forms of exploitation in West African countries, has exacerbated the burden on these nations, resulting in concerning economic conditions. Western nations' policies in Africa often exhibit a lack of due respect for the sovereignty of African countries, allowing global giants like Russia and China to steadily expand their influence with different policy paradigms. For African countries, international assistance and foreign trade and economic cooperation are important, but the political objectives of the Western countries that are embedded in such assistance and cooperation have a negative impact on the long-term development of these countries and pose a threat to their sovereignty and independence. Burkina Faso leader Ibrahim Traoré said at the recent 2nd Russia-Africa Summit, " A slave who cannot assume his own revolt does not deserve to be pitied." How Niger, West Africa, and the African continent can escape the fate of being enslaved by the great powers and interfered with by external forces and achieve real development is something that African leaders need to work hard to achieve.

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Challenges and Countermeasures of Collaborative Cultivation of Innovative Talents in Higher Education in the Guangdong-Hong Kong-Macao Greater Bay Area

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KEYWORDS

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Talent Cultivation

ABSTRACT

This research explores the paradigm of innovative talent cultivation in higher education within the Greater Bay Area (GBA), anchored in the foundational tenets of synergy theory. As the GBA emerges as a beacon of regional integration and development, the power of collaboration and synergy becomes evident. The study identifies both the unique opportunities and challenges that the GBA faces in talent development. Emphasizing the importance of linguistic integration and cultural identity, the research proposes a robust collaborative talent cultivation mechanism and advocates for an integrated "Industry-Academia-Research" model. Through an in-depth analysis, the paper highlights how these strategies, deeply rooted in mutual respect, understanding, and shared goals, can instigate transformative change in higher education. The insights presented serve as a valuable blueprint for regions worldwide, underscoring the GBA's pioneering approach to collaborative higher education frameworks that foster regional growth and innovation.

1. Introduction

Following the international bay areas of San Francisco, New York, and Tokyo, the Guangdong-Hong Kong-Macao Greater Bay Area (GBA, see Figure 1) has emerged as a focal point in the global economic landscape, representing a dynamic fusion of culture, economy, and innovation in the new era. Since its establishment in 2019, the GBA has demonstrated rapid growth in regional economic collaboration. This evolution is characterized by the nation's strategic infrastructure development, policy support, and the shared pursuit of economic prosperity and innovative growth across the three regions. Notably, the "Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area" (hereinafter referred to as "the Outline") explicitly emphasizes the aspiration to transform the GBA into a talent hub, invigorating various innovative entities and supporting the youth of Hong Kong and Macao in their mainland endeavors [1]. Clearly, the crux of the GBA lies in the cultivation of innovative talents, which is pivotal for sustained growth and regional competitiveness. Higher education institutions (HEIs) serve as crucial bases for nurturing innovative talents, making it imperative to prioritize the cultivation of innovative talents in Higher Education (HE). In terms of HE, the three major international bay areas have collaborated and integrated university resources and organizational management, significantly enhancing the development of HE [2]. A deeper exploration into the cultivation of innovative talents in HE is warranted. Synergism theory offers a robust theoretical underpinning for the cultivation of innovative talents in the GBA. The theory accentuates the generation of a collective effect through cooperative interaction that surpasses the sum of individual contributions, providing a compelling perspective for the GBA's HE talent cultivation approach. By amalgamating educational resources from the three regions and synergizing multi-stakeholder participation in the talent cultivation process, the GBA is poised to transcend traditional boundaries and establish a novel HE innovative talent collaborative cultivation mechanism. However, the cultivation of innovative talents in the GBA is a long-term endeavor. In such a culturally diverse and vibrant region, despite its abundant resources and unique opportunities, it still grapples with significant challenges in collaborative cultivation, stemming from cultural diversity and insufficient collaborative motivation. Currently, the GBA's innovative talent cultivation has shown initial success but still requires enhancement. On one hand, with robust policy support, achievements have been made in academic-industry collaboration and talent attraction. On the other hand, deeper exploration and strategic intervention are needed in areas such as bridging cultural disparities between the three regions, constructing a unified collaborative cultivation system, and ensuring equitable distribution of educational resources. Thus, this study, grounded in synergism theory and aligned with the GBA's unique developmental context, delves into the developmental trends of the three regions in the HE domain concerning innovative talent cultivation, aiming to elucidate the opportunities, challenges, and future directions for innovative talent cultivation in the GBA.

Figure 1 GBA Cities, Map based on Gov HK [3]

2. Literature Review

2.1 Synergism Theory

Originating from the Greek word "synergos," meaning "working together," [4] synergism emphasizes the enhanced effect produced when entities collaborate. This principle has been applied to understand complex systems, organizational behaviors, and collaborative efforts across various domains. Historically rooted in biological systems, where the combined effect of two or more drugs was observed to be greater than their individual contributions, Chou's pioneering work on the theoretical foundation of synergistic action in drug combinations provided comprehensive insights into how the combined effect surpasses the sum of individual effects [5]. García-Fuente et al. further refined the understanding of synergism, underscoring the importance of accurately determining dose-effect curves for effective synergistic outcomes [6]. The theory subsequently demonstrated relevance in the realms of organizational and talent development. In the context of HE, synergism offers a compelling framework. Synergistic innovation, as defined by the integration, collaboration, fusion, and shared values of HEIs, enhances the efficiency, level, and quality of functional activities in regional educational cooperation [7]. Synergistic cultivation can be perceived as the embodiment of the synergistic concept in talent cultivation. The talent cultivation system in HEIs is a complex system composed of multiple subsystems, such as governments, enterprises, and HEIs, reflecting the essence of synergism theory. Specifically, talent cultivation in HEIs encompasses internal synergies among faculty allocation, specialized courses, and internship bases [8], forming an integrated educational resource and synergizing multi-stakeholder participation throughout the talent cultivation process. Hence, synergism theory forms the foundation for innovative talent cultivation in the HE domain. Moreover, the theory suggests that by fostering a collaborative and supportive environment, regions can amplify their talent development outcomes. Especially in a culturally integrated region like the GBA, coordinated synergies of diverse strengths can propel more innovations and growth, such as deepening teacher collaborative cultivation contributing to win-win regional educational cooperation [9].

2.2 Concept and Practice of Innovative Talent Cultivation

Innovative talent cultivation is a multifaceted concept that has garnered widespread attention in academia and policy circles. At its core, it refers to a systematic process of nurturing individuals' creative thinking, challenging established norms, and driving innovation in their respective fields9. The philosophy of innovative talent cultivation is rooted in the belief that innovation is not merely a spontaneous act but can be nurtured through deliberate efforts. This involves a blend of formal education, experiential learning, mentorship, and exposure to various challenges. Over the years, various models and frameworks have been proposed to encapsulate the essence of innovative talent cultivation. A prominent model is the 21st-century 4C core competency model, emphasizing critical thinking, communication, collaboration, and creativity as the four pillars of innovative cultivation[11]. Through these four core competencies, the model aims to nurture 21st-century talents for lifelong development and to address societal challenges. In practice, innovative talent cultivation often manifests in multiple educational dimensions, such as specialized programs, interdisciplinary courses, research opportunities, and academia-industry collaborations. These initiatives aim to provide individuals with a holistic learning experience, equipping them with the skills and mindset to tackle complex challenges and foster innovation. With the rapid advancements in information technology, the concept of innovative talent cultivation continues to evolve and gain contemporary significance. Zhang et al. explored the blended learning model, emphasizing computational thinking as the cornerstone of innovative talent cultivation[12]. This approach underscores the importance of integrating technology with traditional learning paradigms for effective talent development. Lei, based on the PDCA cycle theory, provided novel insights into how synergistic efforts can significantly enhance innovative talent cultivation in the context of multi-synergistic integrated circuit industries [13]. Rong et al. further delved into the transition from traditional software engineering education to the "Internet Plus" paradigm, emphasizing innovative talent cultivation methods to meet the demands of the digital age [14]. Additionally, the role of the ecosystem, comprising educational institutions, industry partners, policymakers, and society at large, is paramount. A supportive ecosystem can amplify talent cultivation efforts, creating a virtuous cycle of innovation and growth.

2.3 Current Research Status on Innovative Talent Cultivation in the GBA

The GBA is a unique confluence of culture, economy, and technology, evolving synergistically. Given its strategic significance, the region has consistently been a subject of extensive research, particularly in the realm of innovative talent cultivation. In 2020, the Ministry of Education and the Guangdong Provincial Government released the "Development Plan for Higher Education Cooperation in the Greater Bay Area." The plan highlighted the objective of establishing world-class universities in the GBA, playing a pivotal role in realizing the vision of becoming a world-class city cluster and an international hub for talents and innovation [15]. Furthermore, the "Outline" also proposed the strategic positioning of building a "globally influential international science and technology innovation center"[1]. It is evident that innovative talent cultivation can not only align the GBA's education with global standards but also nurture seeds for establishing a science and technology innovation center. In recent years, numerous studies have begun to explore the GBA's talent cultivation methods, challenges brought about by its diverse landscape, and strategies to foster innovation. These studies are primarily concentrated in Chinese journals, with a plethora of literature focusing on the GBA's collaboration and development. As synergism, a theory promoting orderly operations between regions and different systems, many researchers have emphasized methods for the GBA to coordinate the strengths of Guangdong, Hong Kong, and Macao. This involves policy integration, academic collaboration, and industry partnerships, all aimed at creating a conducive environment for talent development. Yang et al. analyzed the knowledge innovation network within the GBA, emphasizing the region's potential and challenges posed by its diverse institutional and cultural landscape [16]. Their findings underscored the importance of strategic collaboration in promoting innovation in the region. Bai & Li conducted a comprehensive review of various talent cultivation models in the GBA, emphasizing the need for innovative approaches to cater to the region's unique requirements [17]. Other scholars have constructed synergistic cultivation models based on the GBA's industrial needs [18], aiming to achieve collaborative cultivation of talents in the field of higher engineering education. These studies provide a multidimensional understanding of the GBA's synergism theory, innovative talent cultivation practices, and unique dynamics. However, current research on innovative talent cultivation in the GBA is primarily based on a single dimension, lacking a systematic study and discourse.

3. Challenges of Collaborative Cultivation of Innovative Talents in the GBA

3.1 Opportunities for the Cultivation of Innovative Talents

The construction of the GBA is a major strategy for promoting regional coordinated development in the new era of China. This indicates a significant shift in the region's policies, funding, and manpower. Such a transformation provides more opportunities for the cultivation of innovative talents. Firstly, the policy support and geographical advantages of the GBA create an excellent platform for innovative talent cultivation, effectively accelerating resource aggregation in the region. The 19th National Congress report clearly defined the construction strategy and policy arrangements for the GBA, emphasizing its vital role as a national strategy [19]. This policy framework highlights the importance of developing the area in line with national objectives, providing a robust environment for innovative talent cultivation. As one of the most economically developed regions in China, located at the center of China's southern coastline, the GBA possesses significant geographical advantages. Internally, it boasts well-developed infrastructure and convenient transportation, especially with the full connectivity of the Hong Kong-Zhuhai-Macao Bridge and the Guangzhou-Shenzhen-Hong Kong high-speed railway, enhancing regional connectivity and promoting resource integration and industrial aggregation. Externally, it serves as a crucial gateway connecting Southeast Asia and the rest of the world. Its thriving trade, finance, and logistics industries continuously enhance the region's economic vitality, building a contemporary hub for innovative talent development.

Secondly, the 21st-century 4C talent cultivation model provides a solid theoretical foundation for the GBA's innovative talent cultivation. The 4C model, emphasizing critical thinking, communication, collaboration, and creativity, is becoming increasingly important in modern society. Critical thinking involves logical thinking and reasoning abilities, helping learners make judgments, decisions, and solve various problems using systemic thinking. Communication refers to effectively expressing one's ideas while listening to others. Collaboration emphasizes working with others and sharing joint responsibilities. Creative thinking involves brainstorming to generate new and valuable ideas. Given the rapid changes and demands of the 21st century, especially in areas like finance, law, e-commerce, entrepreneurship, and business English [17], this model is particularly relevant. A study highlighted the effectiveness of the overall instructional design of Information Problem Solving (IPS), indicating that the 4C model can play a key role in cultivating complex skills like IPS in higher education [19]. Currently, higher education institutions in Guangdong, Hong Kong, and Macao use the 4C model as the core competency for education, jointly exploring directions for curriculum reform, providing guidance for future collaborative talent cultivation. The trend of collaborative education in the GBA is becoming more apparent, with Hong Kong universities establishing branches in the mainland, introducing more innovative teaching concepts to the mainland, and indirectly promoting educational integration between the two places. This emphasis on core competencies ensures not only that talents possess proficient skills but also that they have the soft skills required for innovation and collaboration.

Thirdly, the GBA's outstanding economic strength provides a solid material foundation for its innovative industrial development. With its active and robust economic activities, the GBA's technological innovation capabilities have also seen significant development in recent years. According to the "2020 Global Innovation Index," among the top 100 most dynamic tech clusters globally, the Shenzhen-Hong Kong-Guangzhou tech cluster ranks second, only behind the Tokyo-Yokohama tech cluster. Simultaneously, some universities in the GBA have also demonstrated outstanding research potential and innovation capabilities. Among them, 24 universities have been selected in the third-party index evaluation ranking of world universities, proving breakthroughs in the field of higher education innovation. Five universities in Hong Kong are ranked in the top 100 of the 2022 QS World University Rankings. Hong Kong universities also collaborate closely with mainland industries, achieving the transformation of scientific and technological achievements around the bay area's industrial development. Additionally, the GBA is home to a group of young and vibrant innovative enterprises. Huawei and Tencent have been listed among the world's most innovative companies, playing a leading role in the GBA's innovative enterprise development [20].

3.2 Challenges Faced by the GBA in Talent Cultivation

3.2.1 Identity Differences

The GBA integrates diverse cultural and linguistic backgrounds, making it a region with a complex linguistic ecology of multiple languages and scripts, thus facing significant identity challenges. Due to geographical and historical reasons, the common communication languages in Hong Kong society are English, Cantonese, and Mandarin. In Macao, the primary languages are Cantonese, Portuguese, and Mandarin; in the nine cities of the Pearl River Delta, they mainly use Cantonese, Mandarin, and Hakka [21]. In terms of script, Hong Kong uses English and traditional Chinese characters, Macao uses Portuguese, traditional Chinese characters, and English, while the official script of the nine cities in the Pearl River Delta is simplified Chinese [22]. The "bilingualism and trilingualism" in Hong Kong and the "trilingualism and quadrilingualism" in Macao present challenges for educational integration and talent cultivation in the GBA. These linguistic differences increase the cost of communication and collaboration in talent cultivation.

On the other hand, the GBA has a diverse and complex cultural background, and these cultural differences are significant barriers to innovation cooperation between cities [23]. Although Guangdong, Hong Kong, and Macao have historically belonged to the same Lingnan geographical and social region, sharing a common cultural origin, the cultures of Hong Kong and Macao have long been influenced by Western characteristics due to their colonial history. This continuous collision of Chinese and Western cultures has brought diverse intellectual sparks to Hong Kong and Macao but has also caused long-standing confusion and division in identity recognition among their citizens, especially the younger generation. Cultivating innovative talents requires leveraging the benefits of multiculturalism to foster critical thinking and a broad international perspective while addressing the broader challenges brought about by identity differences. Therefore, it is essential to seek common ground while preserving differences, build a GBA cultural community, face the challenges of the real world and the Hong Kong issue, and adopt coordinated methods to promote collaborative talent cultivation.

3.2.2 Lack of a Unified System of Collaborative Education

Although the three regions within the GBA share common historical and cultural ties, the vast linguistic and cultural differences, combined with the "one country, two systems" policy differences, have resulted in three distinct education systems in the GBA. This differentiation is especially evident in higher education. Despite the emphasis on collaborative talent cultivation in the GBA's development, there is a clear lack of a unified collaborative education system. The absence of standardization may lead to inconsistencies in talent development and hinder the process of collaborative education.

Firstly, there's a lack of unity in educational philosophies and teaching models, leading to insufficient momentum for innovative education. There are significant differences in curriculum content, teaching methods, and evaluation standards among the three regions. In recent years, the GBA has actively expanded higher education resources, enlarging the scale of higher education clusters through independent fundraising and collaborative education. However, this collaboration is mainly concentrated in developed areas like Guangzhou, Shenzhen, and Zhuhai. As the GBA's construction progresses, the layout of universities from Hong Kong and Macao is gradually expanding to cities like Foshan, Dongguan, Zhaoqing, and Zhongshan. Clearly, this is an expansion of Hong Kong and Macao universities into mainland universities. How can universities in the nine cities of the Pearl River Delta accelerate their alignment with Hong Kong and Macao? How can a two-way, interconnected education model be achieved? These are topics that need exploration in the future. Additionally, from a collaborative perspective, the associated effects of the GBA's higher education cluster still appear relatively insufficient. On the one hand, there's a lack of internal association within the education system. Due to the lack of communication and reference between the educational systems of the three regions, it's challenging to smoothly transfer the learning outcomes of students from different regions and universities. This lack of educational communication also increases costs to some extent. On the other hand, the innovative effects of the higher education system's cluster are still lacking. As of 2018, the innovation influence of universities in the Guangdong-Hong Kong-Macao Greater Bay Area was relatively high, only lagging the San Francisco Bay Area [24]. Additionally, compared to the Beijing-Tianjin-Hebei region and the Yangtze River Delta region, the GBA's universities have relatively high R&D expenditure, but the number of R&D personnel is relatively low. This indirectly leads to lagging innovation outcomes, and the quality also needs improvement (see Table 1). It's evident that although the current investment in higher education resources in the GBA is growing rapidly and holds vast innovative potential, there's still significant room for improvement in the transformation and industrialization of technological achievements. The knowledge innovation and overall quality of higher education in the GBA need enhancement.

Table 1 Innovative effects of higher education clusters in the three major regions in 2018 [25]

Region Name	R&D Expenditure as a Percentage of GDP	Number of R&D Personnel	International Papers (in 10,000s)	Patent Applications (in 10,000s)	Proportion of Invention Patents	Proportion of Technology Export Turnover	Growth Rate of R&D Expenditure	Growth Rate of R&D Personnel	Growth Rate of Patent Applications
Guangdong-Hong Kong-Macao Greater Bay Area (GBA)	0.20%	47,772	4.6	2.8	55%	10%	13.20%	6.20%	21%
Beijing-Tianjin-Hebei Region	0.38%	60,126	7.4	3.4	71%	31.20%	13.20%	3.70%	11%
Yangtze River Delta Region	0.16%	91,331	13	9.5	64%	18.90%	12.90%	5.10%	12%

Data source: Guangdong-Hong Kong-Macao Greater Bay Area Higher Education Big Data Research Center

Secondly, there's a lack of efficient integration paths for teaching staff. The primary body for innovative education in higher education is the teaching staff. On the one hand, this group is the core element to ensure the overall improvement of regional higher education quality, playing a vital role in ideological guidance, knowledge dissemination, and promoting social progress. On the other hand, they are the foundation for cultivating innovative talent skills, collaborative development, and joint creation of productivity. Therefore, the teaching staff bears the reform responsibility of cross-border collaborative governance and collaborative education in the GBA. However, the inertia of different educational systems in the three regions, regional environmental differences, and uneven personnel quality restrict the identity recognition and collaborative actions of teachers. Additionally, there are differences in the training standards and core professional capabilities required for teachers in the three regions. In recent years, universities in the bay area have tried to promote reforms in the teacher collaborative training system through teacher exchanges, mutual course recognition, and other methods. The recent 5th Guangdong-Hong Kong-Macao Greater Bay Area Teacher Ethics Forum, jointly hosted by South China Normal University and the Hong Kong Education University, became an innovative attempt for the collaborative development and deep integration of education in the three regions. However, in the long run, the three regions still need to establish a comprehensive teacher training system. This can integrate university teaching resources, form a "knowledge resonance" among the teaching staff, and promote cross-domain collaboration in innovative talent cultivation.

3.2.3 Imbalance of Power

Globally, the primary approach for developed countries to cultivate innovative talents is to build an industry-academia-research model. With the continuous growth of enterprises and civil forces, the integration of industry, academia, and research in the Guangdong-Hong Kong-Macao Greater Bay Area's talent cultivation model is becoming increasingly evident. Although more and more enterprises are trying to cooperate with universities, such as jointly cultivating doctoral students through collaborative education and setting up laboratories for talent R&D and innovation, most collaborations between universities, enterprises, and civil forces in the GBA are spontaneous and autonomous, inevitably facing restrictions in the process. Coupled with the imbalance of rights among these entities, it's challenging to form a joint educational force, which may hinder the formation of collaborative education and affect the overall goal of innovative talent cultivation.

Firstly, the innovative concept of collaborative education is relatively lagging, and the intrinsic motivation for collaboration among the main bodies is weak. The "2020 China Patent Survey Report" showed that the collaborative innovation rate of enterprises, universities, and research institutions was 6.5% [26]. This clearly indicates that the current collaborative momentum in China, and specifically in the GBA, is noticeably insufficient. According to a survey report on the industry-academia-research situation in Guangdong Province, a major region of the GBA, 92.95% of universities are involved in industry-academia-research cooperation, with key universities participating at a rate of 100% [27]. However, the focus of universities, enterprises, and research institutions is not unified, leading to a gap in talent cultivation goals and needs. The lack of a unified talent cultivation standard also makes it difficult to achieve deep collaboration.

Secondly, the system for building collaborative education is not well-established, and there's an imbalance in the levels of collaboration among the main bodies. Due to the inherent complexity and uniqueness of the GBA's internal systems, there's still no reasonable operating management mechanism formed among regional governments, universities, enterprises, research institutions, and even civil organizations. Currently, the GBA's industry-academia-research cooperation lacks reasonable institutional arrangements in terms of policy support, resource collaboration, cooperation models, and feedback mechanisms. This leads to a lack of cooperation within a set of operating rules, resulting in vague cooperation goals, unclear responsibility divisions, restricted resource integration, and unstable sustainable cooperation. Additionally, with the imbalance in the levels of collaboration among the main bodies, communication often focuses on project cooperation, making it difficult to form a long-term, in-depth cooperation mechanism.

Thirdly, the civil forces in collaborative education are restricted, unable to stimulate market vitality. Civil forces include non-governmental organizations, community groups, charitable organizations, and other non-profit organizations, which have tremendous potential in educational cooperation. On the one hand, civil forces can act as bridges between universities, enterprises, and governments, promoting communication and cooperation among all parties. On the other hand, compared to traditional educational institutions, civil forces have greater flexibility in project implementation, fundraising, and talent cultivation. This flexibility often places a higher emphasis on innovation and can quickly adapt to changes in the education sector. For example, the Tin Ka Ping Foundation, as an essential representative of civil forces, frequently collaborates with universities and encourages innovation, which is very beneficial for cultivating innovative talents. In recent years, some think tanks have also begun to explore collaborative education. However, the development of these civil organizations still faces many restrictions. Among them, limitations in funds and resources, and insufficient policy support are often the most significant influencing factors. These not only restrict their operational scale but also affect their role in educational cooperation. Additionally, due to differences in culture, values, and operating models, there may be cooperation barriers between civil forces and universities and enterprises. These barriers may include trust issues, unclear cooperation mechanisms, etc. Furthermore, public misunderstandings and doubts about the role of civil forces in education may also affect their ability to raise funds, recruit volunteers, and cooperate with other organizations.

4. Strategies for Collaborative Cultivation of Innovative Talents in the GBA

4.1 Philosophical Foundation: Language Integration and Cultural Identification

Strengthening language integration and cultural identification in the GBA is crucial for promoting regional integration and talent cultivation. Efforts should be made to transform the linguistic resources of the GBA into cultural capital that promotes regional integration, reinforces national identity, and enhances national competitiveness. On one hand, the rich linguistic ecosystem should be integrated into the higher education talent cultivation system. The promotion of multilingualism, combined with the study of traditional Chinese and regional cultures, will enable talents in the GBA to better understand the cultural implications behind linguistic diversity, fostering a sense of belonging to the GBA. There should also be an emphasis on cultivating international talents through a "Chinese + profession" approach, connecting efforts in faculty development, resource construction, and mechanism innovation through a common language. Moreover, leveraging the abundant resources of the GBA, there's a need to enhance the cultivation of linguistic talents. The unique geographical advantage of the GBA presents a distinctive higher education landscape, with diverse types of institutions, varied operational models, and an evolving interdisciplinary academic structure. This diverse educational environment provides an excellent backdrop for innovating linguistic talent cultivation mechanisms. Efforts should be made to establish collaborative mechanisms for linguistic talent cultivation, enhancing the efficiency and quality of talent cultivation through resource sharing and complementarity [28]. On the other hand, cultural identification is the foundation for innovative collaborative education. It's essential to address the spiritual and cultural needs of the youth in the GBA, guiding them towards a shared cultural consensus and enriching the cultural essence of the GBA.

4.2 Mechanistic Provision: Collaborative Talent Cultivation Mechanism in the GBA

Collaborative talent cultivation in the GBA is an ambitious endeavor, necessitating a comprehensive cultivation mechanism that encompasses top-level design, mid-level systemic interactions, and micro-level practical implementations. From a top-level design perspective, national policies should be refined to provide macro-level guidance for collaborative talent cultivation, such as planning for university clusters, facilitating faculty exchanges, and integrating talent mobility elements. Under collaborative development objectives, both central and local governments should continue to play a guiding role. From a mid-level systemic interaction perspective, collaborative talent cultivation in the GBA requires policy support and coordinated efforts from educational authorities, offering a robust shared platform. For instance, policies should be formulated to define the objectives, content, and steps for university collaborative cultivation. In terms of regulatory governance, there's a need to explore effective directions for evaluating the quality of collaborative higher education, establishing a scientific and efficient dynamic quality supervision system. Additionally, policies that promote integration across the three regions, such as policies for integrating youth from Hong Kong and Macau into the mainland, should be strengthened. From a micro-level perspective, the focus should be on joint teacher training models, utilizing collaborative education platforms for dynamic cooperation. The establishment of a comprehensive development platform for teacher education in the GBA and the construction of professional development training bases for teachers are key to promoting collaborative teacher cultivation. Furthermore, digital platforms should be utilized to create online resource-sharing platforms. The introduction of technologies like cloud computing, big data, and AI can further deepen the integration of collaborative teacher cultivation. The GBA's teacher education collaboration, with its wide scope and significant impact, is a crucial avenue for promoting regional collaborative talent cultivation, providing solid support for nurturing innovative talents in the GBA.

4.3 Collaborative Model: Integration of Industry, Academia, and Research

Under the collaborative theoretical framework, the construction of a talent cultivation mechanism relies on the cooperation of governments, universities, and enterprises. This collaboration aims to establish a balanced and effective evaluation system, achieving a dynamic balance between university talent cultivation and corporate talent cultivation. The integration of industry, academia, and research provides a clear development path for collaborative talent cultivation. Firstly, various stakeholders should integrate their collaborative talent cultivation philosophies, seeking common ground while preserving differences, and strengthening the initiative and responsibility of all parties. Universities, as major venues for talent cultivation, should clarify the purpose and objectives of innovative talent cultivation, constructing an open and innovative system of resource sharing, mutual benefits, joint projects, and collective talent cultivation. Enterprises should play a role in guiding students to translate academic knowledge into practical applications, while research institutions should provide advanced research platforms to compensate for the deficiencies in university research facilities. Secondly, efforts should be made to enhance the collaborative talent cultivation capabilities of all stakeholders, refining the mechanisms for industry-academia-research collaborative cultivation. Establishing management institutions for the GBA's industry-academia-research collaborative cultivation system will facilitate coordination, communication, benefit distribution, and collaborative cultivation among all parties. Information flow and resource integration are essential for ensuring the coordinated operation of all stakeholders. Therefore, through the integration of university curricula, corporate implementation platforms, and research institution outcome transformation mechanisms, the efficient operation of the industry-academia-research integration model can be realized. Lastly, private entities should be encouraged to actively participate in the collaborative talent cultivation initiative, exploring new paths for think tank collaborative cultivation. Think tanks, as the "brain trusts" and "idea repositories" of the modern era, have a unique role in collaborative talent cultivation. To nurture innovative talents, it's advisable to establish a GBA Think Tank Alliance, strengthening regional collaboration in talent cultivation and expanding its outreach, providing more opportunities for the youth to engage on a broader social platform and gain more innovative practical experiences.

5. Conclusion

Amidst the evolving dynamics of regional integration, the GBA epitomizes the potency of collaboration and synergy, particularly in the domain of higher education. The narrative of the GBA, as delineated in this paper, accentuates the criticality of fostering innovative talent within higher educational institutions, thereby promoting regional unity and sustainable advancement. As postulated by scholars like Gray and Westly, collaboration fundamentally revolves around diverse entities harnessing their multifarious strengths and distinctions to surmount inherent challenges. Through mutual value generation and concerted participation, they proffer solutions to pressing imperatives. The GBA's initiatives in amalgamating varied cultural vistas, championing innovation via the "Chinese + Profession" approach and harnessing the "Industry-Academia-Research" collaborative model resonate with this spirit of cooperation. These endeavors are not merely about bridging gaps but about crafting a cohesive matrix of shared values, aspirations, and objectives, all pivoting around the central role of higher education in molding future innovators. Moreover, the GBA's synergistic blueprint for talent cultivation in higher education, articulated through strategic design, systemic collaboration, and grassroots implementation, mirrors a comprehensive strategy for nurturing future trailblazers. By engendering an ambiance conducive to scholastic prowess and innovative ideation, the GBA ensures its intellectual capital is primed with the requisite competencies, acumen, and ethos for the region's sustained ascendancy.

In summation, the GBA's trajectory furnishes invaluable insights into the pivotal role of higher education in regional metamorphosis and the transformative essence of collaboration. By capitalizing on the unique competencies of diverse entities and fostering a unified vision of innovative talent development, the GBA is delineating a roadmap towards a luminous, more harmonized future. As the region perpetually evolves, it stands as a luminary for global counterparts, exemplifying how collaboration, deeply rooted in mutual respect, comprehension, and shared aspirations, can catalyze monumental shifts. The insights gleaned from the GBA's odyssey underscore the paramountcy of collaborative endeavors in higher education in today's interconnected milieu, offering a paradigm for regions aspiring to analogous milestones of integration and progression.

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Research on the co-governance of shared bicycles: taking Shenzhen's legislative consultation as an example

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KEYWORDS

Shared bicycles;
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ABSTRACT

The shared bicycles, which spread diffusely, has become an important part of urban public transportation system. Benefiting from the shared-economy and growth of Internet, the shared bicycles makes up for the shortcomings of traditional public transportation and facilitates urban residents. However, it could not be avoided that a lot of problems such as disorderly expansion and competition, waste of resources, traffic safety, and deposit risks occur posing problems and challenges for urban governance in many cities, including Shenzhen. The shared bicycles is both public and market-oriented，which means if there is no long-term and sustainable standard, it will not be able to fundamentally solve the dilemmas and problems the shared bicycles met. For this situation, Shenzhen has chosen to promote the collaborative governance through legislation. The law establishes the government's authority and responsibility as the main character of governance in regulating the management of shared bicycles, urging the shared bicycles enterprises transform their development strategy to focus more on service optimization and technology innovation. Only by creating a governance model of construction，co-governance and sharing，can shared bicycles get out of or transcend the predicament, develop into a normal means of transportation in the urban transportation system.

1. Introduction

Shared bicycles have carried the hallmark of the sharing economy since their inception. They have driven the reform of bicycle transportation supply through the utilization of the Internet and big data, offering a fresh, green solution for urban transportation infrastructure and residents' mobility. This, in turn, has paved the way for the development of a green and low-carbon economy. While major cities in China have essentially achieved full coverage of rail transit and buses, providing a convenient transportation system, the problem of incomplete coverage in certain areas poses a hindrance to urban residents, a critical challenge for building sustainable green cities and promoting low-carbon urban environments. Shared bicycles address this issue by offering services in densely populated areas with relatively complex traffic situations, thereby expanding the coverage area of public transportation to some extent. They provide a new direction for completing the "puzzle" of the transportation system and promoting eco-friendly travel for city dwellers. Shenzhen, as a major market for shared bicycles in China, has seen significant growth. According to statistics from the Shenzhen Municipal Transportation Bureau as of March 2022, there were over 29 million registered shared bicycle users in Shenzhen, with a daily usage exceeding 1.3 million people.

However, the rapid development of shared bicycles has also presented challenges for urban space management, traffic regulation, and industry development in Shenzhen. To ensure that shared bicycles can thrive and continue to serve the city's residents sustainably, it is crucial to conduct in-depth research on the obstacles encountered during their development and the multiple challenges they pose to urban governance.

2. Literature Review

Currently, there is a wealth of research in China regarding the use of collaborative governance to address the issues related to shared bicycles. Various scholars have presented their viewpoints from different perspectives on the roles different stakeholders play in collaborative governance.

Sun Jin and Yuan Ye suggest that the government should set regulatory boundaries for the development and competition of shared bicycle companies, with a focus on strengthening fair competition review.[1]

Chen Shuquan and Wang Kaiyuan propose that legislation should be introduced to fill the regulatory gaps in the management of shared bicycles. [2]This legislation would provide a legal basis and fundamental support for the operation and management of shared bicycles. Shen Guoqi and Zhang Keke recommend that shared bicycle operators establish a user integrity mechanism to enhance product quality.[3]

Gao Xihan argues that companies should develop strategic plans and use innovative management techniques to address the chaotic competition in the market. Qin Jianguo and others suggest the cultivation of user group awareness to create a self-governing community. [4]This includes helping users develop internal incentives, ensuring mutual supervision by opening up information channels, and achieving autonomous governance of shared bicycles. [5]

Xiao Qian, Lin Kongtuan, and others propose that, in addition to government regulation, there should be efforts to educate users about proper bicycle usage. Shared bicycle companies should establish a user credit system and reduce the costs associated with responsible bicycle usage.[6]

This article, after summarizing the development of shared bicycles in major Chinese cities, examines the multiple challenges and their underlying causes that shared bicycles have faced during their development in Shenzhen. It also analyzes Shenzhen's approach to collaborative governance, as reflected in the legislation enacted in 2021, the first of its kind in the country, known as the "Shenzhen Economic Zone Internet Rental Bicycle Management Regulations." This legislation uses a collaborative governance approach, involving multiple stakeholders in the process, to shape a shared bicycle co-construction and co-governance model.

3.The development of the bike-sharing industry

The concept of sharing, in conjunction with the rise of "Internet+" and the push for "green and low-carbon" initiatives, has rapidly expanded and permeated various industries. Bicycles, as one of the primary means of short-distance transportation for residents in China, due to their extensive presence, garnered significant attention when the concept of "sharing" was integrated with them. Consequently, numerous companies emerged in the shared bicycle industry, and although it initially received substantial social acceptance and recognition, many issues began to accumulate and spread as soon as shared bicycles entered urban areas. While the "development hides a multitude of flaws," temporarily masking these problems, they began to surface as the number of shared bicycles continued to grow, along with the user base. The development of the domestic shared bicycle industry can be broadly divided into stages: the parallel phase of problem accumulation and bike deployment growth, the contradictory phase of problem emergence and sustained development, and the phase of government regulation and guidance.

3.1 Rapid Deployment and the accumulation of issues

The rapid growth of the sharing economy has made the public realize that although shared bicycles are a relatively new concept, their high acceptability and cost-effectiveness have led to explosive growth in user registration and usage as these bicycles are deployed. Simultaneously, the pursuit of scale expansion for greater benefits by shared bicycle companies, coupled with the increasing demand from residents, has driven these companies to adopt even "panic-inducing" deployment strategies to capture the market, resulting in a rapid increase in the number of shared bicycles in cities. Each shared bicycle company has chosen its own competitive strategy and primary target areas. Mobike, for example, has focused on utilizing smart technology to enhance the riding experience. [7] On the other hand, Ofo has emphasized large-scale deployment to increase convenience. Ofo expanded its shared bicycles to major cities, while Mobike focused on the Beijing, Shanghai, and Guangzhou markets. Youon Bike primarily deployed its bicycles in the Yangtze River Delta and Pearl River Delta regions, while xiao-ming bicycles operated primarily in the Shanghai area. As of the end of 2016, the total number of shared bicycle users in China had reached nearly 20 million. In Shenzhen, there were seven companies deploying internet bicycles, with over ten million registered users, more than 500,000 deployed bicycles, and an average daily turnover rate of 5.4 times per bicycle. [8]

Upon the entry of shared bicycles into urban environments, various governance issues have continued to accumulate. Initially, users would park these bicycles haphazardly, causing blockages in urban spaces and provoking dissatisfaction among citizens and public opinion. Subsequently, some shared bicycles were subject to vandalism, unauthorized use, and damage by certain users. This led to an increasing number of shared bicycles being abandoned and left to deteriorate due to a lack of timely recovery and repairs, ultimately turning them into "urban litter." This not only inconvenienced users but also resulted in significant losses for the companies operating the bicycles. Furthermore, the timeliness and fairness of deposit and refund arrangements by some shared bicycle companies soon garnered widespread social attention. Even amidst the public discourse and controversies surrounding these issues, shared bicycle companies, without fully addressing these problems, continued to adopt aggressive market expansion strategies, continually increasing the scale of bicycle deployment and user acquisition.

3.2 The conflicting between emergence of shared bicycles and sustained development

As both the number of shared bicycle companies and the volume of deployed bicycles continued to increase, preexisting issues remained unresolved and were increasingly pronounced. Some shared bicycle companies lacked long-term planning and crisis management capabilities, and their capital backers were unable to provide sufficient support. Faced with the compounding challenges, some companies opted to transform their business models or exit the market altogether. Many cities, including Beijing, Shanghai, and Shenzhen, recognized that the excessive expansion of shared bicycles was causing various governance problems. To mitigate the negative impacts of shared bicycle development on their cities, these cities began to limit the number of shared bicycles through special enforcement actions and similar measures. In September 2017, the Shenzhen Municipal Transportation Commission issued the "Implementation Plan for Standardized Management and Rectification of Internet Rental Bicycles in Shenzhen." This plan called for a suspension of additional bicycle deployments in public urban spaces during the period of regulation and rectification. [9]It also required that improperly parked bicycles be handled through a unified platform. Violations involving bicycles parked in public areas without timely removal could result in fines and vehicle confiscation for the companies responsible. Furthermore, within just a year after two major rounds of substantial financing, Little Yellow Bike (Xiao Ming), which had accumulated over 4 million registered users and collected over 800 million yuan in deposits, faced bankruptcy and legal actions. It became the first shared bicycle company in the nation to declare bankruptcy. [10] Meanwhile, the industry giants Ofo and Mobike also confronted significant challenges in their continued development. In December 2018, Ofo faced a financial crisis, involving several billion yuan. The inability to refund user deposits sparked a major controversy. Some media outlets obtained Ofo's balance sheet from around six months prior, which showed debts exceeding 6 billion yuan, with user deposits exceeding 3.5 billion yuan. Mobike, despite being acquired by Meituan and receiving new capital injection, maintained its fundamental business strategy and continued to experience losses. [11]Shared bicycle companies facing significant developmental crises attempted to salvage their operations by adjusting business strategies, dealing with the aftermath, or choosing to exit or transition. However, those that continued to operate shared bicycles still lacked new business strategies and remained trapped in the cycle of "fundraising—deploying more bicycles—capturing more customers—expanding fundraising." They had not yet found a sustainable and profitable development path that could coexist with urban order.

Although shared bicycles fundamentally entail a rental process and establish contractual relationships based on the rental of a vehicle, the rental procedure for shared bicycles is more straightforward, cost-effective, and convenient compared to renting traditional modes of transportation. It offers a short-distance transportation solution that targets the "pain points" of many residents, which has garnered significant user recognition. The low barriers to usage and convenient conditions have attracted a massive user base. User demand, grounded in practicality, has provided continuous impetus for the expansion of shared bicycles. This has also driven companies to compete with a "quantity-first" approach, to some extent, overlooking the issues and risks that accumulated during development. Shared bicycle companies have persistently sought to expand their coverage, intending to survive by covering up problems, and this approach has led to the exacerbation of issues rather than their resolution. As shared bicycles continued to grow, these problems spread and eventually led to a critical point where the development of shared bicycles faced significant challenges and entered a vortex of controversy.

3.3 The government's regulatory and guidance

The development of the shared bicycle industry has not only profoundly altered the urban transportation landscape but has also attracted significant capital investment, driven by profit motives. Under the influence of capital-driven growth, shared bicycle companies often overlooked the optimization of bicycle management and development strategies. This led to the accumulation of challenges related to deposit collection and refunds, space occupation, and other issues. The negative consequences of these challenges directly impacted urban transportation governance and the maintenance of social order, gradually distancing the shared bicycle industry from its original goal of optimizing urban transportation. The shared bicycle industry opened up a new realm of development, and local government regulations for urban transportation were not prepared to address this emerging sector. Therefore, the management of shared bicycles became an unavoidable and pressing issue that governments needed to address.

The shared bicycle industry, from its inception and rapid expansion to the challenges it faced, demonstrates that a nascent sector cannot achieve sustainable development solely through self-regulation and industry self-norms. Local governments, as the leaders of governance, must not only play the role of managers but also create a favorable market regulatory environment. They should continuously adjust their strategies in managing the industry while providing moderate guidance for its development based on the interests of the city and the maintenance of social order. Taking Shenzhen as an example, the government's approach to regulating and guiding the shared bicycle industry is characterized by a top-down and rapid response. On one hand, the government can promptly issue targeted governance policies. On the other hand, management practices are gradually moving towards "baseline thinking," emphasizing guidance for the development of shared bicycle companies without excessive direct administrative intervention. For instance, in February 2017, Shenzhen's traffic police bureau, education bureau, and other entities jointly issued a "Joint Statement on Regulating the Use of Shared Bicycles by Minors." This statement targeted shared bicycle companies and their user information screening processes, prohibiting the use of shared bicycles by children under 12 years of age. In September of the same year, the Shenzhen municipal government issued the "Implementation Plan for the Standardized Management and Rectification of Internet Rental Bicycles in Shenzhen," requiring strict rectification of shared bicycles within six months. This plan covered areas such as the scale of shared bicycles and the establishment of new parking areas. If shared bicycles were improperly parked and not promptly addressed, companies would face fines and the confiscation of their shared bicycles. Subsequently, Shenzhen continued to optimize its approach to shared bicycle management. After thoroughly considering input from relevant companies, the public, and experts, the city transitioned from action-oriented governance to normative governance. In 2019, Shenzhen introduced interim measures and standards for the management of internet rental bicycles, specifying detailed infrastructure and technical requirements for deploying bicycles and setting service standards for shared bicycle companies. These measures also defined the scope of government management and responsibility relationships across different government levels and departments.

4.The multiple challenges in shared bicycle governance in Shenzhen

Shenzhen, as a large and densely populated metropolis, faces a multitude of challenges in governing shared bicycles. These challenges primarily revolve around three key areas.

4.1 The competition for spatial usage rights in the shared bicycle

The spatial usage rights in the shared bicycle industry can be broadly categorized into two main aspects: the right-of-way required for riding on roads and the right to park shared bicycles in urban public spaces. The right-of-way pertains to the specific space and time allocated for traffic participants, including motor vehicles, pedestrians, and bicycles, to conduct transportation activities on roads. In the context of urban traffic, this right-of-way is defined by traffic regulations and pertains to the space and time allocated for various traffic participants to operate on roads. [12]Over the past few decades, urban development in China has seen a significant increase in the number of motor vehicles, which has gradually led to the erosion of dedicated cycling lanes. For instance, in the case of Shenzhen, during its early development, bicycles had relatively well-defined rights-of-way. However, as the city rapidly expanded and the number of motor vehicles surged, bicycles lost their dedicated rights-of-way, and motor vehicles established dominance in terms of road usage rights. The increasing popularity of shared bicycles has resulted in debates and disputes over the redistribution of road usage rights. The question of whether bicycles can reclaim a significant share of existing road usage rights has become a crucial factor in determining the growth of shared bicycles. In densely populated metropolises like Shenzhen, where road and land resources are extremely scarce, resolving conflicts related to the allocation of road usage rights presents a challenging issue for the government, which serves as the road administrator. [13]The competition for road usage rights is a fundamental issue that directly impacts the successful integration of shared bicycles into urban transportation systems and requires careful consideration and resolution.

Since the inception of shared bicycles, their inherent public transportation value and innovation have been acknowledged by both the government and society. However, during the rapid expansion of shared bicycles, the issue of parking rights was sometimes neglected. The government relied solely on voluntary actions by shared bicycle companies to establish parking zones and urged users to park their bicycles in a regulated manner through recommendations. Shenzhen, as a densely populated metropolis with a complex transportation system, relies heavily on public transportation for most of its residents. Shared bicycles conveniently cover short distances between transportation hubs, residential areas, and workplaces, providing a convenient mode of mobility. However, during rush hours, many shared bicycles are haphazardly parked around subway and bus stations, occupying limited space with a large number of bicycles. Furthermore, due to the uneven distribution of shared bicycles and user density, shared bicycles often experience temporal clustering and dispersion in densely populated areas. Users sometimes lack a sense of public ethics, resulting in the disorderly parking of shared bicycles and impacting urban order. Two main issues contribute to the problem.

First, Lack of User Awareness and Public Ethics: Many users, in their pursuit of convenience and time savings, often park shared bicycles arbitrarily, contributing to urban disorder. The low cost of punishing those who damage shared bicycles has led to phenomena such as vandalizing shared bicycles with paint or modifying their components for personal use, turning shared bicycle resources into a "tragedy of the commons."

Second, Failure to Implement Electronic Fencing: Despite government encouragement to shared bicycle companies to use GPS to designate permitted and prohibited parking areas and set up electronic fences to regulate bicycle parking, many companies have not fully implemented these measures. This reluctance is due to various factors. Firstly, relying on user self-awareness is nearly impossible. Therefore, enforcing electronic fence parking rules must be associated with punitive measures. This implies that companies need to define boundaries for user behavior, and the severity of these punitive measures can influence user willingness to continue using the service, potentially leading to customer attrition. Secondly, setting up electronic fences introduces a new layer of competition. From a profitability standpoint, parking space represents profit potential for shared bicycle companies, and each company will strive to secure space through various means, which could create additional negative impacts.

The parking rights conundrum in Shenzhen's shared bicycle ecosystem reflects a complex interplay of user behavior, market competition, and the need for effective governance to maintain urban order and facilitate the continued growth of shared bicycles.

4.2 The lack of long-term and unified regulatory standards

The economic nature of shared bicycles underscores their highly market-oriented characteristics. Yet, it also carries an implicit implication that government regulation, as the "visible hand," must intervene to ensure the proper development of the bike-sharing industry. Without such intervention, there is a risk of capital expansion and investment becoming chaotic, ultimately undermining the effective functioning of bike-sharing systems. In recognition of this, in 2017, the Ministry of Transport and other relevant authorities issued guiding opinions requiring internet-based bicycle rental companies to enhance awareness among their staff responsible for bicycle parking management. This involved the implementation of measures such as monitoring credit records to effectively regulate user parking behavior. While these recommendations were well-timed and aimed at addressing the issues arising from the rapid growth of bike-sharing, the actual governance challenges are far from simple. Each city presents unique disparities in terms of geographic areas, bike-sharing operators, and user demographics. As a result, the guidance provided may not effectively resolve the root problems. In the case of Shenzhen, shortly after the issuance of the "guiding opinions," the city quickly released specific guidelines for curbside bike parking. However, these measures fell short of fundamentally resolving the issue of disorderly bike parking within the city. On one hand, due to the limited scope of the documents, the lack of comprehensive management directives from the government left room for uncertainty and negotiation between businesses and the authorities, giving rise to deeper governance challenges. This complexity makes the governance process significantly intricate. Furthermore, even as the responsibilities of government departments have become more defined, the existing administrative system in China, characterized by multi-agency cross-management, often leads to blurred responsibility boundaries, a culture of shifting responsibility, and low efficiency in executing actions. These challenges have undoubtedly exacerbated the complexities of comprehensive governance for bike-sharing. In the case of Shenzhen, despite the issuance of several targeted documents aimed at addressing the challenges faced by the city's bike-sharing sector, a lack of unified management standards and clear directives among different departments remains a notable issue. Various agencies, including the Transportation Commission, Municipal Urban Management, and Municipal Traffic Police, have all played roles in the regulatory framework, creating a somewhat fragmented approach. For instance, the planning and construction of urban bicycle transportation networks and the provision of guidance for bike parking facilities have been under the purview of different departments. [14]In contrast, the direct regulation of bike parking requires collaboration among the Municipal Traffic Police, the Municipal Urban Management Department, and local neighborhood offices.

Bike-sharing companies not only function as industry operators but also hold vast reservoirs of data. They have access to information such as the number of registered users, user activity, fleet size, distribution patterns, deployment strategies, maintenance standards, technology deployment plans, and user reward and penalty rules. Recognizing the importance of governing the behavior of these companies, governments have sought to establish regulations that compel bike-sharing companies to assume the role of key stakeholders in managing vehicle parking and maintenance. However, the bike-sharing industry is relatively new, and both companies and regulators are still in the process of navigating uncharted waters. This lack of mature experience and empirical data can make it challenging for the industry and government to formulate scientifically grounded regulations and standards for specific technologies, thereby undermining the rationality and scientific basis of industry norms.

4.3 The conflict between the public nature and market orientation of bike-sharing services

The development of the bike-sharing industry exhibits a dual nature. As part of the transportation system, it offers a high degree of accessibility, making it a form of public transport. In this sense, bike-sharing services possess a public character, and bike-sharing companies can be seen as providers of public services. One of the key characteristics of public bike-sharing systems is their strong public welfare aspect, often operating as a nonprofit endeavor with a significant one-way cost incurred by the government. These systems are marked by limited capital reinvestment and recycling. While some areas, including parts of Shenzhen, have attempted to introduce market-oriented operation to public bike-sharing, they still carry a substantial public welfare aspect, necessitating long-term and sustained financial support to maintain system operation. [15]Traditional city public bike-sharing systems entail various expenses, including vehicle selection and deployment, infrastructure construction, vehicle maintenance, recovery, and replenishment, all of which are covered by the government. This approach represents a means by which the government executes its social functions. However, in the case of bike-sharing, it operates as a profit-generating tool provided by private enterprises. In the bike-sharing industry, the market takes precedence over the government as the main operator, delivering both bicycles and services. Bike-sharing systems emphasize operational efficiency and have a high degree of market orientation, operating as profit-driven tools for businesses. They aim to generate revenue by quickly establishing leasing relationships with users and prioritize cost recovery and financial returns on the initial investment. This approach offers significant operational flexibility compared to traditional public bike-sharing systems.

From this perspective, an inevitable conflict arises between profitability and the common good. Enterprises, in order to sustain the operation of bike-sharing services, inevitably seek to maximize their returns. [16]However, bike-sharing services, as a form of social public service, must consider the balance between profit and the common good. Firstly, bike-sharing, while operated by private enterprises, still relies on public resources, making it unrealistic to be completely detached from the public sphere. In essence, bike-sharing services generate revenue by utilizing public spaces. While these services contribute to the improvement of urban transportation, the profit-maximizing nature of bike-sharing companies means that they cannot independently and thoroughly resolve the various public issues arising from bike-sharing. These problems remain unresolved and recurrent, leading to the inefficient waste of public resources and increased urban governance costs. Secondly, the unregulated expansion driven by "land-grabbing" and "user acquisition" practices by bike-sharing companies. The number of users and the land area occupied by each station are the foundation for the expansion of bike-sharing companies. To ensure stable flow and income, many companies opt for early "expansion" based on quantity rather than actual demand. According to a report by the Shenzhen Municipal Transportation Commission, Shenzhen witnessed a surge in the number of bike-sharing bicycles from over 400,000 to nearly 800,000 between 2016 and 2018. [17]

Moreover, due to the flexibility of business operations and competitive needs, companies hold certain proprietary information that cannot be disclosed in a timely manner, resulting in information asymmetry in society. This leads to a lag in the oversight role of politics and society, resulting in market failure and strong negative externalities. Thirdly, conflicts arise from the misalignment of interests among bike-sharing companies, the government, and users. Bike-sharing companies are concerned with maintaining revenue levels. They must weigh the impact on profit maximization when formulating penalty mechanisms for violators and recovering damaged bicycles. This lack of enthusiasm on the part of companies to actively implement stricter bicycle management measures can be attributed to this consideration. [18]The government, as the main body of urban governance and manager of social resources, seeks to improve governance efficiency and reduce governance costs. It requires companies to cooperate in assuming corresponding social responsibilities to prevent the wanton waste of social resources, thereby indirectly increasing the operating burden and expenses of businesses. Users, driven by personal interests and the convenience of use, often find it difficult to fully adhere to various parking management rules.

5. A Collaborative Governance model for Bike Sharing

The bike-sharing industry combines the openness of the sharing economy with the convenience of the internet. It is provided by market-oriented private enterprises and offers a public service. Traditional approaches of either "restrictive" or "laissez-faire" governance, where issues are addressed in a piece-meal fashion, are not conducive to the healthy development of the industry. Therefore, legislation is necessary to establish a sustainable and uniform set of management standards. The governance of bike-sharing is a multi-stakeholder collaborative process. Collaborative governance emphasizes the voluntary, equal, and cooperative participation of all stakeholders. This is essential due to the complexity, dynamics, and diversity inherent in the social system. In the process of promoting legislative governance of bike-sharing, it is essential to prioritize collaborative governance. Leveraging the unique function of collaborative legislation, it allows the government, enterprises, citizens, and other stakeholders to engage in discussions. This ensures the clarification of responsibilities for all parties involved, enabling legislation to strike a balance among the various interests and gain broader acceptance. It becomes the "greatest common denominator" for bike-sharing governance. The concept of legislative negotiation is both universal and distinctive. Through negotiation, consultation, and argumentation, it facilitates constructive interactions among the nation, the ruling party, and various segments of society. [19]This connects the realm of public discourse with the institutionalized legislative process, allowing the opinions of various segments of society to exert a substantial influence on legislative decisions. As a result, it expands the depth and breadth of democracy. In the process of promoting legislative negotiation, the government, as the principal entity responsible for urban governance and social resources, plays an irreplaceable role in establishing the rules of conduct for members of society. It guides other stakeholders to collectively achieve management objectives. [20]However, this does not imply that other stakeholders are superfluous or incapable of contributing to governance. On the contrary, given the critical importance of "negotiation," if undue focus is placed on a particular stakeholder's role while neglecting the participation of others and obscuring their responsibilities, the process of governance, even with legislation in place, will be fraught with challenges.

5.1 The legislative negotiations led by governing bodies

In Shenzhen, since the inception of the bike-sharing industry in the city, various management measures have been introduced at different times to address specific issues. While these measures have proven effective in the short term and provided timely solutions to certain problems, they have been lacking a more robust and sustainable set of management standards. This changed in 2021 with the introduction of the "Regulations on the Management of Internet Rental Bicycles in the Shenzhen Special Economic Zone," which took the form of legislation and played a pivotal role in guiding the collaborative governance of bike-sharing. From the perspective of the period before and after the enactment of this legislation, the government, as the primary governing entity, demonstrated proactive leadership. Taking legislative negotiation as an opportunity, the government guided bike-sharing companies to standardize their operations. The government assisted these companies in reshaping public trust as a core objective in their industry development. This entailed integrating the diverse social resources controlled by different stakeholders to enhance the effectiveness of social governance and create a legal basis for governance. This proactive guidance from the government can be primarily observed in the following three areas.

Firstly, it is essential to engage in multi-party negotiations. The term "multi-party" primarily signifies the richness of negotiation levels and the diversity of the system. In contrast to the "directed consultation" employed in the formulation and execution of laws and regulations, "multi-party negotiations" emphasize the involvement of multiple stakeholders at different levels. To effectively address the multifaceted issues arising from the development of bike-sharing, the government cannot simply rely on a command-and-control approach. Instead, it should adopt a service-oriented mindset and work towards issue resolution by creating platforms, enhancing institutional frameworks, strengthening oversight, and providing information. Through collaboration with market entities and social forces, the government can engage in institutional, financial, and information provision, allowing various stakeholders to participate in collaborative governance. The growth of the bike-sharing industry presents novel governance challenges, necessitating the introduction of new laws and regulations to address existing gaps and optimize governance efficiency. At this juncture, multi-party legislative negotiations become a crucial opportunity for consensus building. The government's involvement in legislative negotiations within the political consultative conference aids in strengthening connections between its members, market entities, and the general public. This process enables the authentic and objective collection of relevant opinions, facilitating the fulfillment of its duties. It also harnesses the strengths of political consultative conference members and democratic parties in political consultation and participation in governance. These efforts revolve around the challenges presented by bike-sharing policies, using legislation as a foundation and governance effectiveness as the goal, and involve the receipt of valuable decision-making advice and recommendations.

Secondly, it's important to establish standardized management. As urban populations continue to grow and approach saturation, the number of shared bicycles should not be unlimited. It needs to be maintained at a reasonable proportion to the city's population. Since the introduction of bike-sharing in Shenzhen, many bike-sharing companies have employed strategies like the "bicycle flood" and "territorial expansion" to expand their market presence. This has often led to an increasing ratio of bikes to residents, which places added strain on the city's transportation system, adversely affecting the daily commutes of its citizens. Through various targeted governance efforts, the Shenzhen government recognized the need for legal mechanisms to regulate the volume of shared bikes and to determine a total supply that better aligns with the city's needs. Building on the foundation of legislation, starting from 2017, Shenzhen has engaged in discussions and collaborative actions with bike-sharing companies to establish dynamic deployment ratios for shared bikes in different areas, addressing the problem of excessive concentration of bikes in specific times and locations. This effort seeks to rectify issues like shared bikes occupying pedestrian paths and motor vehicle lanes, creating new traffic congestion "black spots," and the phenomenon of excessive bike accumulation in specific areas.

Thirdly, there's a need to enhance urban transportation planning to protect the "road rights" of shared bicycles. Disputes over the right of way for shared bicycles have been long-standing in Shenzhen. As the governing authority, Shenzhen's relevant departments, prior to pushing for legislation, invited various stakeholders, including companies, residents, and community organizations, to participate in the governance process through negotiated discussions. This gradually shifted the previous focus on prioritizing motor vehicles in road allocation, improving the travel conditions for shared bicycles, and laying the groundwork for legal justification for "road rights." Starting from a collaborative governance approach, the legislative push officially affirms the status of shared bicycles, further integrating them into the city's public transportation system. With the introduction of legislation, shared bicycles are considered in the planning and development of transportation infrastructure and roads. Beyond 2022, the Shenzhen government, as a means of keeping the legal framework up-to-date, continues to engage in negotiations with various stakeholders to update regulations governing bicycle use and corresponding penalties, thereby providing legal protection for shared bicycle users. Simultaneously, this ensures the standardization of shared bicycle usage behaviors and enhances their integration with other public transportation modes.

5.2 Driving the repositioning of businesses for development logic

Shared bicycle companies must establish a solid operational logic as the foundation for long-term success in urban environments. A reasonable operational logic implies that companies should not only focus on profitability but also take on social responsibilities related to product management and maintenance. Businesses cannot sustainably operate while accumulating debt or constantly shifting resources to cover operational shortcomings. To operate successfully in the long run, they should have the necessary resources to address any negative social consequences their products may produce. Since the inception of the shared bicycle industry, collecting user deposits has been a common method for generating revenue. Relying on deposit fees for profit implies that the business model of shared bicycles is shifting closer to traditional bike rental services. However, considering that many shared bicycle companies have chosen to exit the bicycle market and diversify their business models, there are significant doubts about whether this approach can sustain businesses in the long term. As the costs of deploying, maintaining, and reclaiming shared bicycles continue to rise, maintaining low usage fees may lead to insufficient revenue for the companies. If price adjustments are too steep, it could deter users, leading to a significant decline in the overall profitability of shared bicycles. Thus, it is important to strike a balance between generating revenue and ensuring user satisfaction. The indiscriminate pursuit of short-term profit can lead to a loss of users and hinder the development of the industry. After experiencing various controversies related to user deposits in the shared bicycle industry, regulatory frameworks were introduced through multi-stakeholder negotiations and legislation to address these issues. The shared bicycle deposit regulations, as outlined in the "Regulations," represent the consensus and spirit of collaboration achieved through these negotiations. They aimed to establish clear rules regarding the collection of user deposits, thus creating a more balanced and fairer environment. These regulations also clarify that user rental fees have become an essential source of profit for shared bicycle companies, shifting their revenue model away from relying solely on deposits.

To achieve rapid growth and reverse operating deficits, shared bicycle companies have historically employed low-cost services and aggressive strategies to amass more customers, such as the "war of bicycles." However, the practice of offering massive subsidies to gain market share and generate profits has been proven to carry significant risks. It leaves companies without the necessary resources for bicycle maintenance, repairs, and regional adjustments. Furthermore, it hinders their ability to promptly address the negative consequences of shared bicycles on traffic order, city appearance, and other aspects of urban life, thereby preventing the effective management of these societal costs. In the process of participating in legislative negotiations, companies must recognize that the demands of other stakeholders should not be overlooked within the framework of collaborative governance. [21]If companies aim to sustain their operations by increasing profitability, they must cooperate with other governance stakeholders, especially while receiving guidance and support from the government, to reshape a sustainable development logic and create new profit models or avenues. From the perspective of assisting companies in redefining their development logic, the government plays a role that combines service and management. Legislative negotiations serve as a crucial means of achieving these objectives. Within the boundaries of applicable laws and regulations, shared bicycle companies can diversify their revenue streams, for example, by heavily developing supplementary income from advertising on top of rental income. This approach can enhance revenue capacity and stability, thus improving the operational capabilities of shared bicycle businesses and fostering sustainability. Collaborative efforts between the government and businesses can lead to the integration of shared bicycles and public bicycles, creating a new model in which the government and companies contribute their strengths, ensuring the long-term success of shared bicycles.

5.3 Facilitating data sharing and technological upgrades

Compared to other cities, Shenzhen stands as a pioneer in the realm of information-based governance. Both businesses and the government possess a wealth of data. Therefore, whether in terms of regulations or laws, each new enactment involves multi-party negotiations before it comes into effect and cannot bypass the application and management of data. Incorporating "negotiation" into legislation provides legal support for the joint construction of a credit mechanism by businesses and the government. This empowers shared bicycle companies to develop rational expansion and deployment plans based on the transportation data and user data provided by the government, preventing excessive deployment that could lead to resource wastage. It also makes it more convenient for users to access information about parking areas and traffic conditions, thus promoting the proper parking of shared bicycles. It also allows the government to diversify its sources of information by gaining insights from user feedback and adjust public policies accordingly.

Embedding the concept of technology and sharing into management, and enabling the sharing, commonality, and negotiation of data among various stakeholders is a concrete manifestation of the sharing concept in the collaborative governance of shared bicycles. On one hand, in the process of governing shared bicycles, the government and businesses can legally aggregate their data into a unified database, accelerating the efficiency of collaborative governance among various parties. By making full use of the advantages of big data's interconnectivity, a data-sharing bridge is established, creating an environment for communication and fostering mechanisms of mutual trust among the government, businesses, and citizens. This ensures that all parties can take more timely actions using real-time data. On the other hand, data sharing is a crucial prerequisite for the collaborative governance of shared bicycles. To establish a trilateral collaborative governance framework, barriers in information sharing and differences in data acquisition channels must be broken down. This allows the government, businesses, and the public to communicate seamlessly and continuously within the context of information and data collection and sharing.

Moreover, the development of shared bicycle companies integrates the characteristics of Internet big data, including mobile payments, location services, and traffic route predictions. This provides an opportunity for technological innovation, the establishment of a collaborative development system among industry, academia, and research institutions. It allows for innovative approaches to address various aspects of shared bicycle development, promoting the integration and efficient utilization of production factors. For example, in the case of legislation resulting from negotiations, which establishes the responsibilities and obligations of companies, there is an emphasis on increasing data transparency. Through open, common, and shared data, companies collaborate with the government to develop a user credit system. Based on user usage patterns, they can create corresponding riding regulations to curb violations and encourage more meticulous management of shared bicycles. Companies can also improve their real-time tracking technology for shared bicycles, aligning with government traffic planning. They can adjust the number of shared bicycles deployed according to population density and space availability. This helps in redesigning parking areas based on demand, providing clearer usage guidance for citizens, and reducing the costs of urban governance.

6. Conclusions

The shared bicycle industry, from its inception to expansion, and facing development challenges, has now embarked on a strategy for transformation and growth. This journey presents new challenges and opportunities for optimizing and advancing urban governance in the new era. The enrichment and improvement of public services depend on the participation of diverse stakeholders. Under the framework of collaborative governance, it doesn't imply that the government is shifting its regulatory responsibilities to other entities. Instead, it raises the bar for how the government can become a more effective participant, enhancing urban governance efficiency. When dealing with a social commodity like shared bicycles, characterized by the Internet and the sharing economy, it's crucial to approach the issue from the perspective of collaborative governance. Through multi-stakeholder negotiations and full-process participation, legislation can be established that provides a long-term and unified standard. Legislation developed through negotiation gains higher acceptance, adaptability, and flexibility. It allows the government to govern with precision and a legal foundation. Within the collaborative governance framework, multiple stakeholders, including the government, market, and the general public, participate in governance. This approach ensures that shared bicycles become a transportation tool that harmoniously coexists with urban development and is compatible with the urban transport system. It maximizes social benefits and promotes public transport services towards greater efficiency and rational supply.

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The Impact of Changes in Geopolitical Patterns on Global Economy and Trade —— a focus on the investment and industrial chain sector

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KEYWORDS

Geopolitical pattern;
Global economy and trade; High-tech manufacturing;
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ABSTRACT

Geopolitical dynamics have always played a pivotal role in shaping the global economic landscape, and recent shifts driven by evolving alliances, trade disputes, technological advancements, and emerging regional powers have presented both challenges and opportunities for countries and businesses operating within this sector. The restructuring of the global industrial chain holds significant implications for China and emerging markets in East Asia. China's increasing influence and geopolitical interference, coupled with disruptions in the high-tech industrial chain caused by US restrictions, have reshaped the geopolitical landscape and created imbalances in global market supply dynamics. Leading economies can cooperate to tackle the human toll of climate change and public health crises by sharing technology in advanced manufacturing and renewable energy. By effectively navigating these changes and embracing collaborative approaches, countries can adapt to the evolving geopolitical landscape, overcome challenges, and capitalize on opportunities for sustainable growth and development in the investment and industrial chain sector.

1. Introduction

The dynamics of global geopolitics have always played a crucial role in shaping the global economy and trade. The intricate relationship between political power, economic interests, and international relations has a profound impact on the investment and industrial chain sector. In recent years, the world has witnessed significant shifts in geopolitical patterns, driven by various factors such as evolving alliances, trade disputes, technological advancements, and emerging regional powers. These changes have brought about both challenges and opportunities for countries and businesses operating within the investment and industrial chain sector.

The current state of economic globalization has prompted American society to question its effects like never before. The long-standing industrial division of labor and geopolitical stability between China and the United States are now facing significant challenges. [1] The existing framework, which shaped the global economic order, is on the verge of being disrupted. Instead, the two major economies, China and the United States, are engaged in intense competition and even conflicts regarding investment, economic, and trade issues, all revolving around the restructuring of the geopolitical pattern.

The repercussions of the global industrial chain restructuring, driven by the United States, will be particularly impactful on China and emerging markets in East Asia. The consequences, especially on the global high-tech industrial chain, are expected to have far-reaching implications. [2] As the United States seeks to assert stricter rules for investments in advanced technologies, such as global technology, it will pose a significant test for Sino-American relations. It is crucial to navigate this situation carefully to avoid any extreme developments in the geopolitical landscape.

Under the premise of averting an escalation of the geopolitical situation, the global market will focus on exploring ways to enhance the resilience of the industrial chain and investment in the face of geopolitical shifts. This emphasis on resilience aims to mitigate the risks associated with disruptions in global supply chains, geopolitical tensions, and trade disputes. Countries and businesses must adapt to the new geopolitical realities and develop strategies that reduce their dependence on specific markets and industries. [3] By doing so, they can minimize risks and enhance their own resilience.

One of the key strategies to enhance resilience is to strengthen domestic industries. Countries can invest in research and development, innovation, and technological capabilities to reduce reliance on external sources. By nurturing a robust domestic industrial base, countries can better withstand geopolitical shocks and maintain economic stability. This approach has been particularly evident in China's efforts to advance its high-tech industries and reduce its reliance on foreign technologies. [4]

Moreover, diversifying supply chains and sourcing strategies can help mitigate risks associated with geopolitical tensions. Businesses can explore alternative sourcing locations and establish strategic partnerships in different regions to ensure a more balanced and resilient supply chain. The concept of nearshoring, which involves locating production facilities closer to end markets, has gained traction as a means to reduce vulnerabilities associated with long-distance supply chains. [5] By spreading production and sourcing across multiple countries, businesses can minimize the impact of geopolitical disruptions on their operations.

Investment diversification is another crucial aspect of enhancing resilience. Investors and multinational corporations often reassess their investment strategies in response to geopolitical changes. This can involve diversifying investment portfolios across different countries and industries to spread risks and capitalize on emerging opportunities. Countries can attract investment by creating favorable business environments, providing incentives, and ensuring political stability. Strengthening regional economic integration through initiatives like free trade agreements and economic blocs can also enhance investment opportunities and facilitate diversification.

Furthermore, fostering international collaboration and dialogue is essential to navigate the complexities of the evolving geopolitical landscape. Countries and businesses must work together to establish transparent and predictable trade policies, promote open markets, and facilitate investment flows. Multilateral organizations, such as the World Trade Organization (WTO), play a crucial role in facilitating negotiations and resolving trade disputes. Engaging in constructive dialogue and seeking win-win solutions can help alleviate tensions and create an environment conducive to economic growth and stability.

In conclusion, the ongoing questioning of the effects of economic globalization in American society, along with the evolving geopolitical landscape, is reshaping the global economic order. The competition and conflicts between China and the United States regarding investment, economic, and trade issues are leading to a restructuring of the global industrial chain. This restructuring, particularly in the high-tech sector, will have far-reaching consequences. However, by focusing on enhancing the resilience of the industrial chain and investment in the face of geopolitical shifts, countries and businesses can navigate these challenges and stabilize the development of the world economy. [6] Strengthening domestic industries, diversifying supply chains and sourcing strategies, diversifying investments, and fostering international collaboration are all key strategies to enhance resilience and adapt to the new geopolitical realities. By embracing these strategies, countries and businesses can mitigate risks, capitalize on opportunities, and build a more robust and sustainable economic foundation.

2. The Impact of Industrial Chain Restructuring on China and East Asian Emerging Markets: Navigating Geopolitical Shifts and Technological Challenges

The restructuring of the global industrial chain has profound implications for China and emerging markets in East Asia. China's growing influence in the global economic and trade pattern is gradually reshaping the geopolitical landscape, particularly in the Middle East, which has traditionally been dominated by the United States. [7] By strengthening cooperation with Russia and other BRICS countries and expanding the Belt and Road Initiative, China aims to assert its position and expand its influence. Simultaneously, the high-tech industrial chain, which determines the future development of the world, faces significant disruptions due to the United States' suppression of China's chip-related industries. [8] This has resulted in an imbalance in the global market's supply dynamics. In response, China is implementing countermeasures in high-tech industries, raw materials, and new energy sectors. Additionally, the implementation and expansion of the Friendshoring policy by the United States have implications for the manufacturing and investment environment of economies in Central and South America and Southeast Asia. This article will explore the multifaceted impact of industrial chain restructuring on China and East Asian emerging markets, considering the geopolitical shifts, technological challenges, and regional market dynamics.

2.1 China's Growing Influence and Geopolitical Interference

China's rise as a global economic power has enabled it to gradually reshape the geopolitical landscape. In the Middle East, traditionally dominated by the United States, China's increasing economic engagement has allowed it to interfere in the region's geopolitical situation and energy market. Through initiatives like the Belt and Road strategy, China has strengthened cooperation with Russia and other BRICS countries, expanding its influence and challenging the United States' long-standing dominance. This evolving dynamic has the potential to create tensions and competition between China and the United States, particularly in strategically important regions.

China's expanding influence in the Middle East and beyond not only impacts global economic and trade patterns but also has significant implications for the energy market. As China secures access to crucial resources, it disrupts the traditional balance of power and challenges the United States' control over energy resources. This shift in power dynamics may lead to increased geopolitical tensions and competition between the two superpowers.

2.2 Disruptions in the High-Tech Industrial Chain

The high-tech industrial chain plays a pivotal role in shaping the future development of the global economy. However, it has been severely impacted by the restructuring of the industrial chain, particularly due to the United States' suppression of China's chip-related industries. [9] These actions have resulted in an imbalance in the supply of the global market, affecting businesses worldwide and introducing uncertainties in the availability and pricing of critical components and technology.

The United States' measures to restrict China's access to advanced technologies and semiconductor manufacturing capabilities have highlighted the vulnerabilities of global supply chains. This disruption has compelled countries and businesses to assess their reliance on foreign technologies and develop domestic capabilities in high-tech industries. China, recognizing the importance of self-reliance, has intensified its efforts to enhance its technological capabilities and reduce dependence on foreign sources. This has led to increased investments in research and development, innovation, and talent development.

2.3 China's Countermeasures and Turmoil in the Regional Market

In response to the challenges posed by the restructuring of the industrial chain, China has been implementing countermeasures to safeguard its interests and reduce vulnerabilities. The country recognizes the need to strengthen key industries to ensure economic stability and mitigate disruptions. By focusing on high-tech sectors, raw materials, and new energy, China aims to enhance its self-reliance and technological advancement.

To achieve this, China has been investing heavily in research and development (R&D), innovation, and domestic production capacity. The government has implemented policies and initiatives to support the growth of industries such as artificial intelligence, biotechnology, semiconductors, and renewable energy. [10] These efforts are aimed at reducing China's dependence on foreign technology and resources while fostering the development of domestic industries.

However, China's pursuit of self-reliance and technological advancement has led to intensified competition within the regional market. As China strengthens its domestic industries, it may disrupt established supply chains and create new dynamics in the global economy. [11] This can have both positive and negative implications for countries in East Asia, particularly emerging markets.

On one hand, the increased competition from China can spur countries in the region to enhance their own technological capabilities and develop new industries. It presents an opportunity for these countries to diversify their economies and reduce reliance on a few key sectors. By investing in R&D, fostering innovation, and improving the business environment, these countries can position themselves as attractive destinations for foreign investment and technological collaboration.

On the other hand, the disruption of established supply chains can create challenges for countries heavily reliant on China as a key trading partner. [12] Changes in trade dynamics, market access, and supply chain disruptions can significantly impact these countries' economies. They must carefully assess the risks and opportunities associated with the evolving geopolitical landscape and adjust their strategies accordingly.

To navigate these challenges, regional cooperation and collaboration become crucial. Countries in East Asia should strengthen their partnerships and work together to mitigate the potential negative impacts and foster resilience. This can involve initiatives such as information sharing, policy coordination, and joint investment in infrastructure projects that promote regional connectivity.

Furthermore, countries in the region should also explore diversifying their trading partners and markets. By expanding trade relationships with other regions, they can reduce their dependence on any single market and mitigate the risks associated with disruptions in the regional market.

In addition to regional cooperation, countries should also focus on enhancing their own competitiveness. This includes investing in human capital development, improving the business environment, and promoting innovation and entrepreneurship. By fostering a skilled workforce, creating a conducive business environment, and encouraging innovation, countries can attract investment and build resilience against external shocks.

It is important for countries in East Asia to remain proactive and adaptable in the face of China's countermeasures and the resulting turmoil in the regional market. [13] By embracing the opportunities presented by China's technological advancements and fostering regional cooperation, countries can navigate the changing dynamics and emerge stronger and more resilient in the global economy.

Reviewing the policies and initiatives implemented by China to support its key industries, it is clear that the country has taken significant steps to foster self-reliance and enhance its technological capabilities. These measures are aimed at reducing dependence on foreign technology, boosting domestic industries, and positioning China as a global leader in strategic sectors.

The "Made in China 2025" initiative outlines specific targets and focuses on high-tech industries, emphasizing indigenous innovation. This strategic plan provides a roadmap for achieving technological advancement and increasing domestic market share in key sectors. The National Integrated Circuit Industry Development Guidelines and the establishment of semiconductor-focused funds demonstrate China's commitment to developing its semiconductor industry. By providing financial support, tax incentives, and research funding, China aims to build advanced chip manufacturing capabilities and reduce reliance on imported semiconductors. The Belt and Road Initiative (BRI) is a comprehensive infrastructure project that promotes Chinese industries and exports. Through investments in transportation, energy, and telecommunications infrastructure, China aims to enhance connectivity and trade, opening up new markets for its domestic industries. China's generous subsidies for new energy vehicles (NEVs) and the establishment of charging infrastructure demonstrate its commitment to reducing dependence on imported oil and combating air pollution. These measures support the growth of domestic NEV production and adoption. The establishment of State Key Laboratories (SKLs) provides significant funding and resources for research and development in key scientific and technological areas. This promotes innovation and supports the development of advanced technologies in priority sectors. China's policies to encourage technology transfer and enhance intellectual property protection aim to acquire foreign technology and expertise while addressing concerns about intellectual property theft. These measures support the development of domestic industries and enhance confidence among foreign investors and technology partners. Furthermore, China's national renewable energy development plans and the provision of financial incentives and favorable policies have positioned the country as a global leader in renewable energy production and deployment.

China's policies and initiatives demonstrate its commitment to fostering self-reliance, enhancing technological capabilities, and reducing vulnerabilities in key industries. By investing in research and development, providing financial support, and implementing favorable policies, China aims to boost domestic industries, reduce dependence on foreign technology, and establish itself as a global leader in strategic sectors. These measures reflect China's determination to shape its economic future and play a prominent role in the global economy.

2.4 Impact of the Friendshoring Policy on Central and South America and Southeast Asia

The implementation and expansion of the Friendshoring policy by the United States have significant implications for the manufacturing and investment environment of economies in Central and South America and Southeast Asia. This policy aims to incentivize companies to relocate their production and supply chains from China to countries in these regions, reducing dependence on Chinese manufacturing. The Friendshoring policy presents both opportunities and challenges for the economies in Central and South America and Southeast Asia. On one hand, it can attract investments, create job opportunities, and stimulate economic growth. On the other hand, it may lead to increased competition among countries vying to attract foreign investment and potential disruptions in existing industrial and trade relationships. To attract investments under this policy, these regions must adopt strategic measures that enhance their appeal to foreign investors.

I. Enhancing Infrastructure and Streamlining the Regulatory Environment

One crucial aspect for attracting investments is the development of robust infrastructure and a streamlined regulatory environment. Improving transportation networks, logistics systems, and digital connectivity is essential to facilitate the movement of goods and information. Upgrading ports, airports, roads, and digital infrastructure can significantly enhance the ease of doing business and make the regions more attractive to investors.

Additionally, governments should focus on simplifying and streamlining regulations and reducing bureaucratic red tape. Clear and consistent regulations, along with transparent and efficient procedures for permits, licenses, and customs clearance, create a favorable business environment. By improving the regulatory framework, Central and South American and Southeast Asian economies can instill confidence in investors and encourage investment inflows.

II. Developing Skilled Workforce and Fostering Innovation

Investments are often driven by the availability of a skilled and adaptable workforce. Governments in these regions should prioritize education and skills development programs to ensure a competent labor force. Collaborating with educational institutions and industry stakeholders can help design training programs that align with the needs of potential investors, fostering a talent pool that matches industry requirements.

Furthermore, promoting innovation and research and development (R&D) activities is crucial for long-term competitiveness. Governments should invest in initiatives that support innovation, such as funding for R&D, the establishment of technology parks and incubators, and the promotion of collaboration between academia, industry, and research institutions. By nurturing innovation and developing a culture of research and development, these regions can attract technology-intensive investments and foster economic growth.

III. Promoting Regional Cooperation and Integration

Regional cooperation and integration play a vital role in attracting investments and creating a more conducive investment environment. Governments should actively participate in regional trade agreements and initiatives, fostering cross-border investment facilitation. Collaborative efforts in infrastructure development, customs harmonization, and joint marketing can create larger markets, economies of scale, and a more appealing investment landscape.

Moreover, engaging in targeted investment promotion activities is essential. Establishing investment promotion agencies or enhancing existing ones can effectively market the regions to potential investors. This includes participating in international investment forums and exhibitions, organizing investment missions, and conducting targeted marketing campaigns. By actively promoting the regions' investment potential and showcasing opportunities, Central and South America and Southeast Asia can generate interest and attract foreign direct investment.

Attracting investments under the Friendshoring policy requires a strategic approach by economies in Central and South America and Southeast Asia. Improving infrastructure, streamlining the regulatory environment, fostering a skilled workforce and innovation, and promoting regional cooperation are key focus areas. [14] By implementing these strategies, these regions can enhance their appeal to foreign investors, positioning themselves as attractive investment destinations. With a conducive investment environment, these economies can unlock their growth potential, drive economic development, and create mutually beneficial partnerships with investors from around the world.

3. The impact of US investment restrictions on the high-tech sector on the Asia-Pacific market

Under the current international economic order, the Asia-Pacific market has emerged as a key investment destination for developed economies such as the United States, the European Union, and Japan in the high-tech sector. These economies have not only invested heavily in the region but have also transferred significant production technologies, contributing to the growth and development of the high-tech industries in

Asia-Pacific countries. However, recent US investment restrictions have the potential to disrupt the traditional industrial advantages and consumer markets in the region, leading to significant long-term impacts.

The United States has implemented various measures to restrict investment in certain sectors, particularly in high-tech industries, citing national security concerns. These measures include increased scrutiny of foreign investments, the imposition of export controls, and restrictions on technology transfers. The primary target of these restrictions has been China, as the US government aims to curb China's technological development and safeguard its own technological leadership. [15]

One of the key impacts of US investment restrictions in the high-tech sector is the disruption of traditional industrial advantages in the Asia-Pacific market. Historically, countries in the region have relied on foreign investment and technology transfers to build their high-tech industries. The presence of multinational corporations from the United States and other developed economies has provided access to advanced production technologies, research and development capabilities, and global supply chains. This has allowed Asia-Pacific countries to leverage these advantages and become major players in sectors such as electronics, telecommunications, and semiconductors.

However, with US investment restrictions, the flow of foreign investment and technology transfers may be impeded. This can hinder the development of high-tech industries in the region, limiting access to advanced technologies and slowing down innovation and competitiveness. Local companies may face challenges in acquiring cutting-edge technologies and may find it difficult to compete globally. As a result, the traditional industrial advantages that the Asia-Pacific market has enjoyed may be eroded, impacting economic growth and job creation.

Furthermore, the consumer markets in the Asia-Pacific region may also be affected by US investment restrictions. The high-tech sector plays a crucial role in driving consumer demand and economic growth, as products such as smartphones, computers, and electronic appliances have become integral parts of daily life. Restrictions on investment and technology transfers can disrupt the supply chains of these products, leading to potential shortages, increased prices, and reduced consumer choices. Moreover, the Asia-Pacific market has been a significant destination for US high-tech exports. Restrictions on investment may lead to a decline in US exports to the region, affecting US companies' access to lucrative consumer markets. This can have a negative impact on the US economy, as the Asia-Pacific market represents a substantial share of global consumer demand.

The policies and initiatives undertaken by the United States, including the passage of bills like the Infrastructure Investment and Jobs Act, The CHIPS and Science Act of 2022, and the Inflation Reduction Act, as well as the reorganization of the alliance system, can have significant implications for global investment in high-tech manufacturing, particularly in the Asia-Pacific region, including China. The passage of the Infrastructure Investment and Jobs Act and The CHIPS and Science Act of 2022 reflects the United States' commitment to enhancing its domestic high-tech manufacturing capabilities. These measures aim to stimulate investment and production in areas such as infrastructure development, semiconductor manufacturing, and research and development. As the United States strengthens its high-tech manufacturing sector, it may lead to increased competition in the global market, potentially impacting investment flows in the Asia-Pacific region, including China.

The United States' efforts to isolate China in the economic and trade system and supply chain through initiatives like the Indo-Pacific Economic Architecture (IPEF) and the CHIP Four Alliance (CHIP 4) can also influence global investment in high-tech manufacturing. These alliances seek to create alternative economic frameworks and supply chain networks that exclude or limit China's participation. [16] As a result, investors and businesses may reconsider their investment strategies and supply chain configurations, leading to potential shifts in high-tech manufacturing investments away from China and towards other countries in the Asia-Pacific region. The US-Japan-India-Australia Quadrilateral Security Dialogue (Quad) and the security partnership AUKUS can impact global investment in high-tech manufacturing, including in China. These collaborations focus on security and defense capabilities, but their influence extends to economic and technological domains. Enhanced security cooperation among these countries may lead to increased scrutiny of investments in critical sectors, including high-tech manufacturing, with implications for China's access to foreign investment and technology.

However, it is important to note that the potential influence on global investment in high-tech manufacturing in China is complex and multifaceted. China remains a significant player in the global high-tech manufacturing sector, with established capabilities, a large domestic market, and ongoing efforts to cultivate innovation and technological advancements. While certain policies and initiatives may present challenges, China's strong domestic ecosystem and market attractiveness may continue to attract investments. Additionally, global investment decisions are influenced by multiple factors, including market size, cost competitiveness, infrastructure, intellectual property protection, and regulatory environments. Countries in the Asia-Pacific region, including China, can respond to changing dynamics by implementing policies to enhance their own attractiveness for high-tech manufacturing investments. This includes fostering a favorable business environment, investing in research and development, strengthening intellectual property rights protection, and promoting collaboration between industry and academia.

The policies and initiatives undertaken by the United States have the potential to influence global investment in high-tech manufacturing, including in China. Efforts to enhance domestic capabilities, reorganize alliances, and reshape supply chains can impact investment flows and strategies. However, the actual outcomes will depend on various factors, such as the implementation of policies, responses from other countries, China's ability to adapt and innovate, and the evolving geopolitical and economic landscape in the Asia-Pacific region.

In response to US investment restrictions, countries in the Asia-Pacific region may adopt various strategies to mitigate the impacts and maintain their growth momentum. One approach is to enhance domestic innovation and research and development capabilities. Governments can invest in education and skill development to foster a pool of highly skilled workers who can contribute to technological advancements. They can also provide financial incentives and support for domestic research institutions and start-ups to promote innovation and entrepreneurship.

Another strategy is to strengthen regional cooperation and collaboration. By working together, countries in the Asia-Pacific region can pool resources, share knowledge, and jointly invest in research and development projects. Regional collaborations can help mitigate the impact of investment restrictions by reducing reliance on specific countries and diversifying technology sources. Initiatives such as joint research programs, technology parks, and intellectual property sharing arrangements can foster innovation and strengthen the overall competitiveness of the region.

Countries in the Asia-Pacific region can explore opportunities to deepen economic integration and diversify their trade relationships. By expanding trade partnerships with other regions and countries, they can reduce their dependence on any single market and mitigate the risks associated with investment restrictions. Initiatives such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership (RCEP) provide platforms for countries in the region to enhance regional economic integration and broaden their trade networks. It is worth noting that while US investment restrictions may pose challenges, they also present opportunities for Asia-Pacific countries to accelerate their own technological development. Restrictions can act as a catalyst for increased domestic investment in research and development, driving innovation and the creation of new industries.

By focusing on areas of comparative advantage, such as renewable energy, biotechnology, and artificial intelligence, countries in the region can position themselves as leaders in emerging technologies.

US investment restrictions in the high-tech sector have the potential to disrupt traditional industrial advantages and consumer markets in the Asia-Pacific region. The flow of foreign investment and technology transfers may be impeded, impacting the development of high-tech industries and consumer access to advanced technologies. However, countries in the region can respond by enhancing domestic innovation, strengthening regional cooperation, and diversifying trade relationships. By embracing these strategies, the Asia-Pacific market can mitigate the impacts of investment restrictions and continue to drive economic growth and technological development in the region.

4. A common global response to the trend

4.1 Enhancing domestic innovation and research and development capabilities in the Asia-Pacific region

Countries in the Asia-Pacific region can prioritize the strengthening of education and skill development programs, with a specific focus on STEM education. By investing in educational initiatives at all levels and promoting vocational training, governments can cultivate a highly skilled workforce capable of driving innovation. Additionally, fostering collaboration between academia, research institutions, and industry can facilitate knowledge exchange, technology transfer, and the practical application of research findings. This can be achieved through funding mechanisms, joint research programs, and technology parks. Moreover, allocating a significant portion of the budget to support research and development activities, establishing dedicated R&D funds, and providing tax incentives for private sector investments in R&D can stimulate innovation and technological advancement.

Governments in the Asia-Pacific region can create an enabling environment that supports innovation and entrepreneurship. This involves streamlining regulations, reducing bureaucratic barriers, and establishing incubators and accelerators to support aspiring entrepreneurs and innovators. By nurturing a vibrant ecosystem, countries can attract talent and investment, foster a culture of innovation, and facilitate the commercialization of research outcomes. Emphasizing industry-academia partnerships and promoting technology transfer agreements can bridge the gap between theoretical knowledge and practical application, leading to industry-led innovation. Furthermore, governments can prioritize the development and adoption of emerging technologies, such as artificial intelligence, blockchain, biotechnology, and renewable energy, by providing funding, regulatory frameworks, and incentives for companies and researchers.

Promoting international collaboration and knowledge sharing is crucial for countries in the Asia-Pacific region to enhance their domestic innovation and R&D capabilities. This can be achieved by participating in joint research programs, collaborating with leading research institutions and industry players from other countries, and fostering knowledge-sharing networks. Access to global expertise, best practices, and cutting-edge research can accelerate domestic innovation. In addition, governments should continuously evaluate and improve their innovation and R&D policies. Regular monitoring of key performance indicators, measuring the impact of policies, and soliciting feedback from stakeholders can help identify areas for improvement. Flexibility and adaptability in policy formulation and implementation are essential to foster a dynamic and thriving innovation ecosystem.

By focusing on these three key areas—strengthening education, collaboration, and funding; creating an enabling ecosystem for innovation and entrepreneurship; and promoting international collaboration and continuous improvement—countries in the Asia-Pacific region can enhance their domestic innovation and research and development capabilities. These strategies will contribute to driving economic growth, fostering technological advancements, and positioning the region as a leader in the global knowledge economy.

4.2 Leading economies work together to address the human toll of climate change and emergent public health crises

The main economies in the world have the opportunity to increase technology sharing in advanced manufacturing and renewable energy, promote the upgrading of global carbon reduction industries, and jointly respond to global emergency public health crises. These collaborative efforts can foster economic resilience, sustainable development, and effective crisis management on a global scale.

One possibility for addressing the impact of changing geopolitical patterns is through increased technology sharing in advanced manufacturing. Advanced manufacturing technologies, such as automation, artificial intelligence, and robotics, have the potential to enhance productivity, efficiency, and competitiveness across industries. By encouraging the sharing of these technologies, major economies can facilitate the diffusion of knowledge and expertise, allowing countries to accelerate their industrial development and reduce the technology gap. This collaboration can lead to the establishment of robust global supply chains, where countries specialize in their comparative advantages, creating a win-win situation for all participants. Similarly, joint efforts in renewable energy technology sharing can contribute to sustainable development and combat climate change. The transition to clean energy sources is crucial in reducing greenhouse gas emissions and mitigating the negative impacts of global warming. Major economies can collaborate in research and development, knowledge exchange, and investment in renewable energy technologies such as solar, wind, and hydroelectric power. Sharing technological advancements and best practices can accelerate the adoption of renewable energy globally, leading to a more sustainable and resilient energy landscape. This cooperation can also create opportunities for job creation, economic growth, and the development of new industries in participating countries.

The main economies can work together to promote the upgrading of global carbon reduction industries. The urgency of addressing climate change requires a collective effort to transition to low-carbon and sustainable industries. Collaborative initiatives can focus on supporting the development and deployment of green technologies, improving energy efficiency, and reducing carbon emissions across industrial sectors. By sharing experiences, knowledge, and resources, countries can accelerate the transformation of their economies, promote sustainable production and consumption patterns, and contribute to achieving global climate goals. Joint responses to global emergency public health crises are crucial for safeguarding public health and minimizing the economic and social impacts of pandemics and other health emergencies. The COVID-19 pandemic has highlighted the interconnectedness of nations and the need for coordinated action. Major economies can strengthen international cooperation in areas such as early detection and response systems, vaccine development and distribution, and public health infrastructure. Sharing data, research findings, and best practices can enhance global preparedness, response capacity, and resilience to future health crises. This collaboration can save lives, protect livelihoods, and facilitate a swift recovery of the global economy.

To facilitate these collaborative efforts, international frameworks and platforms can be established or strengthened. Existing institutions such as the United Nations, World Trade Organization, World Health Organization, and International Renewable Energy Agency can play a crucial role in fostering dialogue, coordination, and cooperation among major economies. Bilateral and multilateral agreements can be forged to facilitate technology sharing, investment flows, and joint research and development initiatives in advanced manufacturing, renewable energy, and public health sectors. Moreover, initiatives such as capacity building programs, joint funding mechanisms, and knowledge-sharing platforms can be established to support developing countries' participation in these collaborative efforts. This inclusive approach can ensure that the benefits of technology sharing, sustainable development, and crisis response are extended to all nations, promoting global economic stability, resilience, and equitable growth.

The impact of changing geopolitical patterns on the global economy and trade can be effectively tackled through increased technology sharing in advanced manufacturing and renewable energy, promotion of global carbon reduction industries, and joint responses to public health crises. By collaborating on these fronts, major economies can foster economic resilience, sustainable development, and effective crisis management worldwide. These collaborative efforts require international coordination, strengthened institutions, and inclusive approaches to ensure that the benefits are shared by all nations. By harnessing collective expertise, resources, and innovation, countries can navigate the evolving geopolitical landscape, address shared challenges, and shape a more prosperous and sustainable future for the global economy and trade.

5. Conclusion

The impact of changes in geopolitical patterns on the global economy and trade, with a focus on the investment and industrial chain sector, is significant and multifaceted. The restructuring of the global industrial chain, driven by evolving alliances, trade disputes, and technological advancements, has brought about both challenges and opportunities for countries and businesses operating within this sector. China's growing influence and geopolitical interference, disruptions in the high-tech industrial chain, and the implementation of the Friendshoring policy by the United States have all contributed to a shifting global landscape.

To navigate these changes and foster economic resilience, countries in the Asia-Pacific region can prioritize enhancing domestic innovation and research and development capabilities. By investing in education, promoting vocational training, and fostering collaboration between academia, research institutions, and industry, countries can cultivate a skilled workforce capable of driving innovation. Additionally, allocating resources to support research and development activities, establishing dedicated funds, and providing incentives for private sector investment in R&D can stimulate technological advancement and create a competitive edge in the global market.

Leading economies have an opportunity to work together and address global challenges such as climate change and public health crises. By increasing technology sharing in advanced manufacturing and renewable energy, promoting the upgrading of global carbon reduction industries, and jointly responding to public health emergencies, major economies can foster economic resilience, sustainable development, and effective crisis management worldwide. Sharing advanced manufacturing technologies and renewable energy advancements can accelerate industrial development, reduce the technology gap, and contribute to a more sustainable and resilient energy landscape. Moreover, collaborative efforts in public health can save lives, protect livelihoods, and facilitate a swift recovery of the global economy in times of crisis.

To facilitate these collaborative efforts, international frameworks and platforms can be established or strengthened, and inclusive approaches can be adopted to ensure that the benefits are shared by all nations. By harnessing collective expertise, resources, and innovation, countries can navigate the evolving geopolitical landscape, address shared challenges, and shape a more prosperous and sustainable future for the global economy and trade. The impact of changing geopolitical patterns on the global economy and trade necessitates proactive and coordinated responses. Through enhanced domestic innovation, research and development capabilities, and collaborative efforts in advanced manufacturing, renewable energy, and public health, countries can adapt to these changes, overcome challenges, and seize opportunities for sustainable growth and development in the investment and industrial chain sector.

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