



POINT

The rise of techno-geopolitical uncertainty: Implications of the United States CHIPS and Science Act

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Abstract

Growing techno-geopolitical uncertainty affects international business in many ways, calling for more scholarly attention to its causes and multinational enterprise (MNE) responses. The United States CHIPS and Science Act epitomizes the country's recent embrace of techno-nationalism in its economic rivalry with China, which has major implications for IB scholarship and management practice. The Act exhibits two features that fly against America's traditional liberal policy stance of championing an open and rules-based multilateral system. First, its reliance on subsidies, export control, and investment screening signifies departure from free trade and from market-based industrial policies. Second, its use of guardrail provisions pursues the weaponization of global value chains for geopolitical and geo-economic purposes. We view the Act as a showcase of a paradigm shift from market-oriented liberalism to intervention-oriented techno-nationalism, heralding a new era of zero-sum thinking and geopolitical prioritization. By examining the broader trend of techno-nationalism, we explore the distinct features of the Act and analyze the geo-strategies that MNEs need to adopt in response to the resulting techno-geopolitical uncertainty. Our analysis highlights the paradigm shift in policymaking, identifies the root causes of this shift, and examines the potential pitfalls it may create. To navigate this uncertain landscape, we suggest four strategic responses for MNEs: geo-strategies, reconfiguration, resilience, and corporate diplomacy.

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INTRODUCTION

International business (IB) is entering an era that we call *techno-geopolitical uncertainty*, and we see the United States (US) CHIPS and Science Act, signed into law in August 2022, as emblematic of this. Around the globe, multinational enterprises (MNEs) in strategic industries are encountering a slate of new legislative, governmental and regulatory policies that aim to regulate global value chains for geopolitical gains, most notably in high-technology sectors. For better or worse, many countries are abandoning their liberal commitments to an open and rules-based multilateral system to

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take more protective approaches to their trade and investment relationships based on national security concerns (Moffitt, 2016). As techno-nationalism surges, technological decoupling becomes aggravated in complex ways such that technological capabilities become anchored to a country's national security and geopolitical power (Farrell & Newman, 2020; Luo, 2022; Witt, 2019; Witt, Lewin, Li, & Gaur, 2023).

We define techno-geopolitical uncertainty as the propensity of disruptions caused by significant policy changes taken by powerful nation states who seek interlocked techno-nationalist and geopolitical gains vis-à-vis rival states. The rise of techno-geopolitical uncertainty takes place against the backdrop of a liberal international order in crisis. Global economic activity has been governed over the past 70 years by a sprawling and expanding liberal international order (Ikenberry, 2018). After World War II, the US¹ and its allies created a complex global governance system that was organized around openness, rules, and multilateral cooperation. Over time, the US became this order's hegemonic leader, anchoring alliances, stabilizing the global economy, and advocating 'free world' values.² This American-led order expanded outward after the Cold War, with countries in East Asia, Eastern Europe and Latin America embracing pro-business reforms to boost their integration into the global economy. For MNEs and IB scholars studying them, the globalizing rule-of-law-based system provided a relatively predictable IB environment in which MNEs mostly relied on market principles to determine how to expand their IB operations and configure their global value chains (Guillen, 2018; Meyer & Li, 2022).

Today, China's rise as a geopolitical rival to the US illustrates growing tensions between the world's two largest economies, and more broadly between their geopolitically and ideologically divided spheres of influence. Some scholars see a crisis of American hegemonic leadership (Allison, 2017). Especially after the Great Recession of 2007–2009, China as an increasingly powerful nation has become more assertive in their contestation of the existing order (Doshi, 2021; Shirk, 2022). In some cases, it has used active engagement with existing institutions to align international norms and values with those of China (Economy, 2022). In other cases, it has created parallel institutions and programs, such as the Asian Infrastructure Investment Bank and the Belt and Road Initiative, which are more responsive to Chinese interests (Kim & Kim,

2022; Li, Van Assche, Fu, Li & Qian, 2022). Other scholars see a deeper crisis of the international order itself. China's apparent ability to profit within the international order has shaken the domestic consensus in the US on defending and preserving the open and rules-based multilateral system, calling into question the adequacy of existing entities such as the World Health Organization (WHO) and the World Trade Organization (WTO) (Weiss & Wallace, 2021). Regardless of the origin of the crisis, the growing economic rivalry between the US and China is transforming global governance, at times creating a techno-nationalist policy environment that MNEs will need to learn to navigate (Kenney & Lewin, 2022; Luo, 2022; Petricevic & Teece, 2019).

We argue that the US CHIPS and Science Act (hereafter the Act) provides a unique window into this new techno-geopolitically uncertain reality and what it means for MNEs. The Act, and the intensification of strategic rivalry between the US and China, reflects, to a large extent, the recognition by both superpowers of the significance of technological revolution in the new era of fractured globalization (Tung, 2023). It exhibits a few features that fit a larger pattern of techno-nationalism that the US has recently adopted. First, it relinquishes free-trade rules and flies in the face of America's traditional policy stance of championing an open and rules-based multilateral system by accentuating market-distorting and pro-subsidy industrial policies. Investment-screening regimes are increasingly muscular guardians of corporate control, and export controls are in the front line of the innovation race between America and China. All this has heralded a new era of zero-sum thinking, raising concerns about the US willingness to lead and defend the global rules-based system as we know it, presenting what we believe to be the dawn of a new techno-nationalist era in US policy. Second, the Act pursues the weaponization of global value chains as a new tool of this techno-nationalism, which will require MNEs to carefully consider geopolitical alliances and rivalries in the configuration of their activities around the world. Concerned with risks to national security and competition with China, the US has obstinately been considering and adopting even more measures beyond the Act to further scrutinize inbound investments from China, while also preparing to control outbound exports and investments to China. We should note that techno-nationalism is only one aspect of economic nationalism, and both



the rationale and implications of the Act extend beyond technological rivalry alone.³

To date, IB research has had little to say about techno-geopolitical uncertainties in the global business environment and about geo-strategies that MNEs should adopt to cope with them. Our objectives are threefold. One, we intend to illustrate how the Act affects international business broadly, including its diverse repercussions for MNEs that originate from different countries (e.g., the US, China, and other countries). Two, we aim to show why and how the Act is a paradigm shift for international business and what it implies for IB research. Three, we endeavor to address some critical strategic responses to be considered by technology MNEs gravely facing geopolitical tensions, particularly between the US and China. By doing so, we attempt to shed new light on corporate geo-strategies needed to adapt to lingering techno-geopolitical uncertainties that disrupt many aspects of international operations for many firms.

THE US CHIPS AND SCIENCE ACT

The US CHIPS and Science Act is a recent example of a techno-nationalist policy that feeds techno-geopolitical uncertainty. The Act, passed by US Congress in July 2022 and signed into law a month later by President Biden, is designed to solidify the US lead in the semiconductor industry while containing China's rise in global competition. This "produce American" legislation sets aside US\$280 billion to boost American competitiveness, with US\$52 billion allocated specifically toward a range of subsidies, tax credits, and R&D incentives to incentivize the construction, modernization, and expansion of semiconductor fabrication and equipment facilities within the US. The Act also prohibits American nationals (citizens and permanent residents) from supporting the development and production of advanced chips in Chinese firms.

These chips are the lifeblood of the modern economy, powering the core technology that runs everything from automobiles and smart phones to nuclear submarines, aerospace, and quantum systems. They virtually comprise the "brains" for everything, from artificial intelligence to machine learning and the internet of things. This in part explains why this legislation entails far-reaching implications, especially for IB, let alone it came out at a perfect storm moment when the COVID-19 pandemic, the Ukraine war, global supply chain

disruptions, widened geopolitical frictions, nationalist sentiment, and global order waning all prevail.

Prior to the 1980s, the US was the uncontested global leader in the semiconductor industry, and it continues to be the principal player in several high value-added segments of the sector such as semiconductor manufacturing equipment, electronic design automation software, and chip design (Bown, 2020; Miller, 2022). However, it has over the years lost its competitive advantage in the fabrication portion of the chips value chain. Between 1990 and 2021, the US share of global semiconductor manufacturing capacity declined from 40% to less than 15%, due in large part to rising costs in the US and catchup investment initiatives adopted in both public and private sectors in other countries and regions, notably in East Asia. Today, most chips that are designed in the US are manufactured by contract manufacturers – foundries – located in Taiwan, Korea, and increasingly China. Among the US semiconductor companies, Intel is the largest, followed by Micron Technology, Broadcom, Qualcomm, Texas Instruments and Applied Materials. While these US companies dominate in fabless and integrated device manufacturing (or IDM), European counterparts (e.g., ASML) maintain a global competitive edge in sophisticated equipment, and Asian competitors (e.g., Samsung and TSMC) hold a stronger position in foundry. Some of America's largest tech firms, including Google, Apple, and Amazon, rely on Taiwan's TSMC alone for nearly 90% of their chip production (Capri, 2022).

Obviously, the US is not the only country offering subsidies and other incentives to entice the reshoring of key technologies and strategic sectors (e.g., China, the European Union, Japan, Korea and Taiwan have also invested enormously in funding their strategic sectors). It is also important to note that the law is not the first episode of US industrial policy targeting the semiconductor industry. Between 1987 and 1997, the Defense Advanced Research Projects Agency (DARPA) dispersed around \$870 million of federal funding to a consortium of the 14 most successful chip manufacturers, known as Semiconductor Manufacturing Technology (Bown, 2020). Viable industrial policies have been recognized to at times be pivotal to fostering competitive advantages and addressing national security concerns (Porter, 1998). As we will expand on below, however, it is unclear if this applies to the current US context.

What makes the Act unprecedented is its expressly geopolitical purpose – containing and weakening China and other “foreign countries of concern” (e.g., Russia, Iran) via geopolitical “guardrail” provisions. According to the Act, any semiconductor company (US or foreign) that receives federal financial assistance is prohibited to engage in any “significant transaction” involving the material expansion of semiconductor manufacturing capacity in China for a 10-year period without approval from the Department of Commerce. In a sense, the provision sets up a quasi-outbound investment screening instrument that the US government can repeatedly leverage to achieve national security imperatives in their geopolitical rivalry with China (NPR, 2022). The statute also gives the US government the ability to designate other countries as “foreign countries of concern” if those countries are “engaged in conduct that is detrimental to the national security or foreign policy of the United States.” Even further, the law gives these agencies the right to reconsider or redefine which technologies are subject to the prohibition.

With the adoption of the Act, there is the risk that other large countries (including China) may copycat the US to safeguard their national interest. While numerous countries (e.g., China, Singapore, Taiwan, Ireland, Germany, Israel, South Korea) have imposed some form of guardrail provisions on their semiconductor manufacturing subsidies, they have to date not embodied any geopolitical terms, prohibitions, and sanctions. The European Union (EU), for example, introduced its own CHIPS Act to better coordinate against supply disruptions, strengthen and scale up production and innovation throughout the EU semiconductor value chain, but it did not impose constraints on the ability of subsidy recipients to do business with other countries. It is worth noting too that following years of lobbying from Washington, Japan, and the Netherlands recently agreed to join the US with chip controls on China, aiming at limiting access of Chinese firms to key chip manufacturing technologies from the likes of ASML, Nikon, and Tokyo Electron. Table 1 summarizes the content of, and our critique on, the Act.

IS THE ACT A PARADIGM SHIFT?

We envision the Act to be emblematic of three landmark inflection points in US technology policy. First, it suggests that the US Administration

increasingly considers it necessary to abandon traditional free-market rules for aggressive industrial policy actions in their intensifying geopolitical and geo-technological rivalry with China, shaking the longstanding consensus in the US on defending and preserving the open and rules-based multilateral system. Second, it underscores the policy shift to pro-subsidy industrial interventions in high-technology industries. Although such policies by the US government (and other nations) are not entirely new, they have become much more plentiful nowadays. Third, it highlights the US government’s attempt to weaponize global value chains in strategic industries for geopolitical purposes. The three features fly in the face of the liberal principles of an open rules-based multilateral system that have underlined both globalization activities and IB theories over the past decades, pushing further economic and technology decoupling in areas that one can argue are strategic in global competitiveness and national interests. Taken together, they suggest that the US may be abandoning its role as guarantor of the liberal international order and global business and instead is itself injecting significant techno-geopolitical uncertainty into the system.⁴

Relinquishing Free-Trade Rules

We see the Act as part of a larger shift in the US technology competition strategy against China that started under the Trump administration and continues under the Biden administration. The semiconductor industry is unsurprisingly front-and-center in this strategy given its importance in today’s digitized world, its globalized operations, its dual military-civil use, and the global chips shortages during the COVID-19 pandemic, but it is not the only strategic sector that is eyed by the US government. In its geopolitical pursuit against rising China, the Biden administration has signed an executive order mandating ‘China-free’ supply chains within several strategic industries and has expanded the bundle of other measures such as sanctions, export controls, license restrictions, and blocking investments and acquisitions by Chinese firms in US “strategic” sectors (Capri, 2022). For example, in an effort to remove China’s rising strength in the battery supply chain, the 2022 US Inflation Reduction Act disqualifies electrical vehicles that contain Chinese batteries or battery materials from receiving US tax credits. This also exemplifies the US government’s recent embrace of friend-shoring, that is, encouraging US companies

Table 1 The US CHIPS and Science Act and our critique

Feature	Description	Critique	Explanation
<i>Purpose</i>	To solidify US lead in the semiconductor industry and contain China's rise	<i>Unclear long-term competitiveness</i>	The Act may only amplify the competitiveness of the US semiconductor manufacturing segment in the short-run, but may weaken both the US and the global system in the long-run
<i>Funding</i>	US\$280 billion set aside, with US\$52 billion specifically allocated toward subsidies, tax credits, and R&D incentives	<i>Dependence on other countries</i>	No country is self-sufficient in every semiconductor supply chain segment and the US lacks some essential segments for chip manufacturing
<i>Historical context</i>	US was once the global leader in the semiconductor industry but has lost competitiveness over the years	<i>Intensifies geopolitical conflict</i>	The Act will force China to be more self-sufficient, exploit its own choke points in key areas on which the US firms depend, and intensify confrontations between the world's two largest economies
<i>Major US MNEs</i>	Intel, Micron Technology, Broadcom, Qualcomm, Texas Instruments and Applied Materials. However, US tech firms rely on Taiwan's TSMC for nearly 90% of their chip production	<i>Hinders multilateralism</i>	The Act, due to flagging multilateralism and a weakened liberal international order, risks further undermining these institutions and making multilateral collaboration more difficult
<i>Difference with other countries</i>	Emerging economies (including China) offer incentives to attract key foreign technologies. EU poses certain export control for high-tech products. Generally, these countries don't prohibit transactions with foreign firms nor pose extraterritorial sanctions	<i>Monitoring & implementation challenges</i>	While national security and geopolitical concerns are certainly legitimate, policies dealing with foreign investment and transactions have far-reaching consequences and are costly or difficult to monitor and enforce
<i>Constraints</i>	Prohibits any significant transaction involving expansion of semiconductor manufacturing capacity in China for 10 years without approval from the Department of Commerce		

in strategic sectors to concentrate and diversify their supply chains within a group of geopolitical allies with shared democratic values (Harput, 2022). The goal is to prevent less-like-minded nations from unfairly leveraging their market position in key raw materials, technologies, or products to disrupt the US economy or those of its allies (NPR, 2022). In short, the Act came along with growing decoupling and de-globalization (Witt et al., 2023).⁵

The US government has put forward several arguments in favor of the passage of the Act (Ernst, 2021), which have also helped legitimate the more general shift towards techno-nationalist policies. A first position is that China's rising technology prowess threatens US leadership in semiconductors, that this threat will materialize sooner rather than later, and that there is therefore an urgent need for a new US policy approach to counter China's rise. As National Security advisor Jake Sullivan stated, "we have to revisit the longstanding premise of maintaining "relative" advantages over competitors in certain key technologies. We previously maintained a "sliding scale" approach that said we need to stay only a couple of generations ahead. That is not the strategic environment we are in today. Given the foundational nature of

certain technologies, such as advanced logic and memory chips, we must maintain as large of a lead as possible".⁶ According to this view, the US needs to seek absolute technology superiority in its strategic rivalry with China and should therefore prevent Chinese progress on advanced technologies both directly and indirectly by denying key semiconductor products and technologies.

A second position is that a more vigorous industrial policy is essential to win this technological leadership race against China and its state-capitalist model. Deputy Secretary of Commerce Don Graves recently laid out the Biden Administration's views of its Modern Industrial Strategy: "We're focusing these public investments and leveraging private investment in key areas such as semiconductors and clean energy technologies where private industry, on its own, had not factored in our national and economic security interests. We are working with business not only on *what* they invest in, but in *how* they operate, encouraging ways of doing business that get the most out of our workforce through quality jobs and mitigate climate risks. The goal with all of this to enable the American private sector to do what it does best – innovate, scale, and compete" (Graves, 2022). This focus on state support to cultivate strategically important technology

sectors is a departure from the past, when industrial policy was typically viewed as an abomination by many American political and economic leaders. And it is substantial. In addition to the large funding investment provided for US semiconductor manufacturing, the new legislation directs the Department of Commerce to establish 20 regional technology hubs throughout the US that will focus on technology development, job creation, and expanding US innovation capacity (PwC, 2022). While big players that build US manufacturing operations are the ones who will gain the most from the Act, there is the belief among many that smaller companies can be indirect benefactors of the new commitment to build a better American microelectronics fabrication industry (NPR, 2022). When the industry's ecosystem takes advantage of the incentives offered by the Act and global semiconductor manufacturing shifts more toward the US,⁷ it is foreseeable that companies whose operations are currently centered in Asia could increase their business ties to the US. There will certainly be a trickle-down effect where component makers see an increase in orders as the giant manufacturers build out (Calhoun, 2022).

Accentuating Market-Distorting Industrial Policies

The US has long accused China of using its state-led system to subsidize and distort its economy and international business (Bown, 2020). This includes the complaint that China thwarts the liberal principle that domestic and foreign firms should trade on a level playing field by providing Chinese state-owned enterprises (SOEs) with unfair trade advantages and by imposing forced technology transfer deals on foreign businesses as condition for accessing the Chinese market (Mavroidis & Sapir, 2021). The US is also concerned that the Chinese state's close channels of communication with its private sector provides it with a critical lever that it can exploit to advance its geopolitical interests (Gertz & Evers, 2020). And the US is worried about the overly heavy influence of the state in the Belt and Road Initiative (BRI), where the government plays a key role in selecting BRI projects, financing them with preferential loans from Chinese state-owned banks, and using state-owned enterprises for their construction (Li et al., 2022). A burgeoning IB literature studies how this state capitalism shapes China's outward foreign direct investment and global competition (e.g., Buckley, Clegg, Cross, Liu, Voss, & Zheng, 2007; Sutherland, Anderson, Bailey, & Alon, 2020).

In the past, the US has largely responded to these concerns related to China's state capitalism by leaning on the open rules-based international system. One approach has been to bring complaints to the World Trade Organization (WTO) against alleged Chinese violations and blocking the appointment of judges to the WTO Appellate Body against perceived judicial activism that condones Chinese state-capitalist policies (Mavroidis & Sapir, 2021). Another approach has been to negotiate new trade agreements such as the Trans-Pacific Partnership with the intent to create an economic bloc that has strong liberal standards including on investment, the environment, labor, IP rights protection, and state-owned enterprises.⁸

The Act departs from this traditional approach by openly embracing the sort of market-distorting policy that the US has accused China of pursuing (Krueger, 2022). Instead of promoting a level playing field that facilitates the private sector's ability to exploit America's areas of comparative advantage, the Act's reliance on a generous subsidy program to attract semiconductor fabrication signals that the US government is ready to embark on a global subsidy race with China that tries to defy comparative advantage to upgrade its industry.

We acknowledge that there are scenarios when it is appropriate for countries to adopt subsidies in strategic industries, but we do not believe they apply in the current context. Subsidies are a good policy tool when used to correct market failures, that is, when competitive markets fail to deliver socially desirable outcomes (Lin & Chang, 2009). For example, subsidies can encourage businesses to invest in intangible assets such as research and development that benefit not only their firm, but the industry or society as well. They can also help start-ups survive an initial period of losses until they grow large enough to be profitable (infant industry argument). And they can be used on national security grounds to protect strategic industries so as to assure continued production in the event of a war. The Act's focus on influencing the location decisions of large and highly profitable firms in the manufacturing segment of the semiconductor industry, however, suggests that these conditions do not apply here (Calhoun, 2022). Indeed, many leading semiconductor companies including TSMC, Intel and Samsung had already committed to increasing their manufacturing capacity in the US prior to the announcement of the subsidies program (Lincicome & Blumsack, 2021).



The US escalation of market-distorting industrial policies presents three concerns. First, the upside of a strategic subsidy program remains unclear for any country. Under its “Made in China 2025” Plan, China has channeled billions of yuan in subsidies to private firms in strategic sectors such as semiconductors, but the jury is still out whether this was effective (Hammer & Yusuf, 2020). Similarly, America’s 1990s subsidization of R&D in the semiconductor industry ended up inducing its member firms to lower their R&D spending (Irwin & Klenow, 1996). Second, it is doubtful that the US can beat China’s well-oiled state-led system at its own game. The US government, which has historically kept an arm’s length relationship with its private sector, lacks the Chinese government’s close connections with firms (Gertz & Evers, 2020). This prevents the US from effectively developing industrial policies to compel firms to take actions that advance the state’s interest, or at least not as efficiently as China. Third, the downside for the global trading system can be large. The embrace of subsidies is a sign of the failure of multilateral subsidy control in the global system, suggesting that export mercantilism and other forms of selective subsidization will become an increasingly persistent feature of policy responses around the globe (Evenett, 2019). Since most of the competitors of the US in semiconductor manufacturing are like-minded partners such as Taiwan and Korea, it points to a serious problem of policy coordination as they are likely to feel slighted by US technological nationalism.

Weaponizing Global Value Chains

More concerning, the guardrail provisions in the Act represent an effort by the US government to weaponize global value chains to achieve its foreign policy goals. This weaponizing means using global value chains as a tool to achieve geopolitical advantages rather than as an economic or trade goal in and of itself. That is, it allows the US government to increase its control over the global value chain activities of recipient firms not only within America’s borders but also extraterritorially in a way that hurts its geopolitical rivals. Both the US and China (and other countries) have recently expanded the concept and employed it with increasing enthusiasm (Capri, 2022).

To see how this weaponization works, it is important to recognize that countries which oversee critical hubs in global value chains can strategically use their position to choke off critical

economic flows to other countries to their geopolitical advantage (Farrell & Newman, 2019, 2020). Japan’s reaction to a spat with Korea related to wartime retributions demonstrates how choke points can be weaponized. In 2019, Japan restricted exports of three high-tech chemicals to Korea that are being used for making semiconductors and display screens. Japan’s global dominance in the production of these chemicals made it difficult for Korea to source these inputs from elsewhere, and thus threatened to create severe disruptions to Korea’s semiconductor industry.

The Act’s guardrail provisions were designed with a similar choke point logic in mind. There are only a handful of semiconductor companies around the globe that have the capability of fabricating the most advanced chips, including TSMC, Samsung, Intel, Micron Technology, SK Hynix, Global Foundries, and Texas Instruments. The guardrail provisions can thus stifle the development of China’s semiconductor fabrication sector if most of these firms decide to buy into the Act, since subsidy recipients are not allowed to conduct any significant transactions involving the material expansion of semiconductor manufacturing capacity in China for 10 years. Should TSMC or Intel receive funding, for example, they would be prohibited from building or expanding semiconductor facilities in China for a decade.

The Act forces global semiconductor companies to consider a critical tradeoff: do the benefits of the US federal assistance exceed the cost of decoupling their global value chains from China that is expected to be the world’s largest semiconductor market by 2030? With the lion’s share of the Act’s subsidies being expected to go to Intel, Texas Instruments, Micron Technology, Global Foundries, Samsung and TSMC, the answer for now seems to be yes.

The Act is part of a growing number of US policies that attempt to weaponize global value chains. This includes laws that endeavor to prevent MNEs from corporate complicity in human rights abuses along their global value chains. The 2021 Uyghur Forced Labor Prevention Act, for example, states that “Any goods, wares, articles, and merchandise mined, produced, or manufactured wholly or in part in [Xinjiang] should be assumed to be the product of forced labor unless proven otherwise by clear and convincing evidence.” In doing so, the law aims to pressure MNEs to move their global value chains out of Xinjiang to put pressure on China to refrain from engaging in

alleged human rights violations against its Uyghur population. The US government has also weaponized global value chains in their use of foreign direct product rules and export controls to restrict Huawei's access to semiconductors. Not only did the US government curb exports of American-made chips to Huawei and its affiliates, it also stopped US semiconductor equipment manufacturers from exporting their products to any foreign-located companies that sold chips to Huawei (Bown, 2020). Foreign-located firms were thus presented with a choice: continue to do business with Huawei and lose access to American-made tools or stop selling to Huawei and continue to buy American equipment.

While the geopolitical guardrail provisions may in the short run consolidate America's lead in semiconductors, it entails several important risks. First, China considers the Act (combined with other recent techno-nationalist policies) as an act of economic warfare against China's semiconductor industry and is bound to retaliate in due course, perhaps trying to exploit its own choke points in rare earths or other areas. It is unclear how beneficial the vicious circle of US actions followed by Chinese retaliation will be for US technological leadership. Second, the Act may well turn into a Sputnik moment for China, triggering even deeper collaboration and resolve between the Chinese government and its chipmakers to try creative engineering solutions to develop sophisticated semiconductors and chart their own course.⁹ Third, the geopolitical guardrail provisions may alienate several US allies who are ambivalent about being stuck in a US–China technology war on which they were not consulted.

IS REALISM RETURNING?

We argue that the US government's shifting positions unveils the return of a political realist narrative in American policymaking that builds on the zero-sum thinking that states win when they make the self-state stronger and rival states weaker (Mansfield, 1994; Mearsheimer, 2001). We maintain that IB scholarship will need to consider realist narratives to understand today's growing techno-geopolitical uncertainty and MNE responses.

Realism is an international relations theory that conceptualizes the global system to be built on self-interested states that compete for power. Since the system is considered anarchic, states use any means available to retain or strengthen their influence in

world affairs, often causing tension and conflict among rival states (Beitz, 1997; Wight, 1991). In other words, realists maintain that the pursuit of national interests trumps higher ideals (such as the commitment to openness, rules and multilateral collaboration), and that policies reflect this.

According to this intellectual tradition, the original backing of the rules-based international system by the US was primarily because it was self-serving (Wight, 1991). As the world's hegemon, the US created and maintained, for its own benefit, sets of international institutions (or regimes) that govern aspects such as trade and investment. Realists believe that the US will keep the existing system in place as long as it remains strong enough to do so and the benefits from keeping the system exceed the costs (Moffitt, 2016). They argue that the US will abandon the rules-based order once it is no longer in its national interest to uphold it. This could be due to a shift in the balance of power, such as China's rise in power and the inability of the multilateral system to constrain it.

We interpret the Act as the outcome of an increasingly potent realist view in the US government that new policies are needed to win the rising technological battle with China, even if it undermines the multilateral system. The Act advances its techno-nationalist pursuit for geopolitical competition. It combines geopolitical, economic, national security, and ideological considerations. It builds on the thought of "new techno-nationalism" that links cross-border technological exchanges directly to a nation's national security, advocating strong interventions by the state against opportunistic or hostile state and non-state actors from other countries (Luo, 2022). Per the realism logic, it seeks to attain geopolitical gains, building on the premise that the world has entered a new era of systemic rivalry between competing geopolitical powerhouses that differ markedly in ideological values, political systems, and economic models (Farrell & Newman, 2020). This logic rests on the assumption that the competing powerhouses seek to implement technology-enabled mechanisms that enforce and empower vastly different standards around data privacy, surveillance, censorship, transparency, digital money, and intellectual property (Luo, 2022).

While realism-based actions such as the Act may in the short run amplify the international competitiveness of the US semiconductor manufacturing segment relative to that of China, we are concerned that the realist nature of the Act will in the long-run weaken both the US and the global system for a



number of reasons. First, no country is self-sufficient in every semiconductor supply chain segment (Bloomberg, 2022), and it is unclear that this is desirable from either a competitiveness or a national security viewpoint (Farrell & Newman, 2020). The US, for instance, lacks such segments as photolithography tools (the most expensive and complex technology in the industry), highly skilled labor required for complex chip manufacturing, and an advanced manufacturing base (Calhoun, 2022; PwC, 2022). As Porter (1998) pointed out years ago, governmental support alone is insufficient for country competitiveness, which instead necessitates country openness, market competition, workforce productivity, industrial endowment, and even political stability. These will all be undermined in a world with realist policies.

Second, it is unclear to us that the Act will fully commit the most competitive semiconductor firms to place their most performing manufacturing plants in the US. Firms that decide to receive federal funding are required to limit their engagement with China, a country that is already the largest semiconductor market, which is a commitment that many leading firms might not be willing to take. In 2020, China represented 53.7% of worldwide chip sales, or \$239.45 billion out of \$446.1 billion (PwC, 2022). A deeper analysis is needed to determine which type of firms are most likely to take on this offer, under what conditions, and what this means for US competitiveness.

Third, and in line with China's recent Dual Circulation Strategy, the Act will force China to invest more heavily in technologies and be more self-sufficient itself. It may in this respect develop its own geopolitical guardrail provisions that will discriminate against US or foreign companies that have received funding under the Act. Meanwhile, Chinese firms in semiconductor businesses may be compelled to further diversify their global supply chain in cutting-edge chips by partnering with non-US chipmakers who do not receive the US incentives. For legacy (less advanced) chip technology and semiconductor manufacturing, which are not targeted by the Act's guardrail provisions, Chinese firms are already a powerful global competitor. A deeper impact, though, lies in deteriorated confidence of Chinese firms (both state and privately owned) in, and even resentment against, investing in the US as well as their heightened hesitancy of cooperating with US companies for operations both in China and abroad.

Fourth, the Act will itself also intensify geopolitical confrontations between the world's two largest economies, fueling the existential crisis of the liberal international order and presenting new uncertainties and complexities facing MNEs, even those from third countries and outside of technology sectors (Bloomberg, 2022). Ironically, friendshoring purportedly divides "free-market democracies" from authoritarian regimes but the policies that are aimed to drive this IB reconfiguration, including the Act, sharply contradicts the market-based doctrine that has been deeply embedded in the US economic policies over the past decades (PwC, 2022). In our view, the Act creates opportunities for some third-country semiconductor MNEs investing in US (e.g., financial incentives) or selling in China (e.g., exports or partnerships), but overall pains for international business likely outweigh gains given the high interdependence of global value chain activities, for which both China and US are important players. Southeast Asian businesses, for example, find themselves vulnerable to spillovers from US–China trade tensions that threaten global value chain integration and promote reshoring, thereby weakening an important pillar of regional economic growth (Krueger, 2022).¹⁰ We also foresee that restrictions hindering access to high-tech markets in the US and China also raise the potential for creating two entirely separate technology ecosystems, which consequently affect many third-country players. As China produces a larger share of technological goods domestically, the separation grows.

Finally, this legislation, which arose in part due to flagging multilateralism and a weakening liberal international order, risks to further undermine them. Postwar institutions (e.g., UN, WTO) have helped provide economic stability and security for the world. Global order matters because geopolitics often lack higher authority to adjudicate disputes and confrontations among states and importantly this order offers some global standards and norms that can help guide and govern bilateral and multilateral tensions (Moffitt, 2016). Weakening international governance allows, unfortunately, the prevalence of techno-nationalism around the world, makes it more difficult to perform multilateral collaboration, and opens for more discriminatory trade and investment policies (Moisio, 2018).¹¹

HOW SHOULD MNEs RESPOND?

The Act poses new challenges for MNEs' global operations, from reorganizing global value chains to reconfiguring global R&D and manufacturing. It increases the difficulty for MNEs in finding a delicate balance between global market dynamics and incompatible national policies that stretch extraterritorially through the weaponization of global value chains. As such, leading semiconductor firms find themselves facing a paradox: they need compliance with home and host countries' national interests and government requirements, but they also need to grapple with increased interstate tensions and associated interventions in various markets where they operate. We understand that MNEs have limited choices or alternatives to formulate such strategic responses. For example, they may find it difficult to determine which countries can be considered friendly territory and how this may change over time as techno-nationalism permeates.

While it is a tall task for us to present specific actions to be adopted by MNEs in this context, it is clear that the Act will push related MNEs to rethink their geo-strategies and re-assess their exposure to geopolitical and geo-economic risks. Those greatly relying on market shares from both the US and China (market dependence) and technology contributions from these countries (technology dependence) will need to do so most carefully and most urgently as they need to balance between independence (and related control and risk mitigation) and interdependence (and related partnerships, networks and ecosystems) between nations and firms. MNEs need to respond to it in numerous areas, recalibrating geo-strategies, reconfiguring global value chains, augmenting resilience, and executing effective corporate diplomacies.

First, formulating *geo-strategies* that adapt to the Act and to the techno-geopolitical uncertainties it generates is imperative for MNEs. Geo-strategies require MNEs to set up processes to identify and monitor techno-geopolitical risks across a company's global footprint, which are different from traditional political risks that often remain confined within a country (Meyer & Li, 2022; Schuler, Rehbein, & Cramer, 2002). MNEs also need to quantify the impact of geopolitical competition on revenue, supply chain, market entry, M&A, R&D, and other global activities and prepare mitigation plans that could be applied in different scenarios. If

MNEs operate in geopolitically high-risk but competitively important markets, they will need to develop both market-specific and global assessments that fuse corporate strategy and risk management. MNEs, from the US or elsewhere, that avail themselves of the Act's funding, for example, will find it increasingly difficult to balance between seeking efficiency and targeting global compliance. And, assuming China eventually builds more domestic semiconductor self-sufficiency, these companies will potentially find themselves nipped if China seeks reprisals against those that stood by the Act.

For many MNEs, even the best geo-strategies may unfortunately come with a significant decline in market prospects. In a potential return to a bifurcated world not seen since the Cold War, globally active MNEs might once again need to choose in which region of the world they want to be active. For example, the CHIPS Act represents MNEs with an inverse real option problem. Accepting US federal funding takes away a semiconductor firm's right to take a future action regarding its tangible or intangible assets (e.g., investing in Chinese production facility, acquiring ownership share of a partner with facilities in China). In a context of high techno-geopolitical uncertainty, the cancelled real option may well prove to be an especially bitter pill to take for the most competitive and globally engaged MNEs that are currently market leaders in both the US and China but now may need to take a side.

Second, *reconfiguration* is an essential response, describing an MNE's efforts to realign its global posture with new geopolitical conditions. Through the approach, firms aim to maintain evolutionary fitness by adjusting certain parts or regions of global operations in response to fundamental changes in geopolitics (Witt, 2019). This reconfiguration is a strategic adaptation to both opportunities (from geopolitical cooperation) and threats (from geopolitical competition). To achieve so, MNEs may limit their internationalization efforts to friendly territory – that is, geopolitically aligned host countries or markets that uphold good ties with the home country (Petricevic & Teece, 2019). As the Ukrainian war has demonstrated, however, traditional allies are not always aligned on all issues, making it sometimes difficult to determine which countries can be considered friendly territory and how this may change over time.

Proper reconfiguration may also require a flexible architecture for global operations, signifying that



critical components, technologies, designs, and production are not overly dependent on a few focused nations that preserve malignant political relations with other countries wherein the MNE has a vast strategic stake. Alternatively, they may strengthen regionalization – that is, putting more investment emphasis on neighboring countries of the firm's global hubs that hold friendly or cooperative ties with the home country. From a cost-benefit perspective in response to trade wars and protectionist policies, MNEs benefit by regionalizing their operations (Van Assche & Gangnes, 2019). For Chinese MNEs, this reconfiguration also extends to their domestic operations to cope with dual circular economies pushed by the government, and reintegration of foreign-domestic activities. While it sits in the core premise of action-based dynamic capability theory (Zahra, Petricevic, & Luo, 2022), reconfiguration in response to techno-geopolitical disorder has been scarcely studied, yet it is such a critical issue nowadays that virtually every MNE around the world has to come up with viable responses that suit its needs.

Third, *resilience* is a pivotal response to geopolitical techno-nationalism. To cope with geopolitical shocks and chronic stresses associated with the Act and similar policies, foresight that accommodates extreme uncertainties becomes a scarce tacit knowledge that can guide the firm towards recovery and transformation from these shocks. In a world of complex geopolitical changes, a rigid, deterministic plan will not be adequate for long (Luo, 2022). But making everything flexible can be an expensive and messy path, too. MNEs can cement their own geopolitical resilience by focusing more investment on cooperative areas between states, working with corporate peers to advocate for viable national policies, and relocating strategic investments from geopolitically risky countries to “neutral” ones that connect strongly with home, host, and other countries (Luo, 2022; Verbeke, Coeurderoy, & Matt, 2018). This approach requires geopolitical experience, quality networks and partnerships, structural agility, and resilient leadership.

One specific means by which to accomplish resilience at times of techno-geopolitical disruptions is power delegation within the MNE. That is, swift mobilization of global resources and rapid problem-solving requires enough autonomy to frontline subsidiaries that maintain both critical positions and capabilities to lead.¹² Another approach is the reduction of supply concentration and enlargement of supplier diversity. Although

there are costs to adding alternative supply sources for global operations, multi-tier global supply chain system differentiated by varying strategic importance and by varying vulnerability to techno-geopolitical disruptions may help, even though they do not leave the MNE immune against the most stringent geopolitical guardrail provisions. A third consideration lies in the approach of focused factory and export expansion. Focused factories that manufacture model variants on a single platform located in a friend-shoring country and then shipped the finished products for the rest of the region or the world. Fourth, the springboard actions – investing in a third country that may serve as a gateway to global resources or markets, or that maintains stable and cooperative bilateral ties with target countries (Witt, 2019), may help curtail some techno-geopolitical obstructions. Finally, adjusting business or product portfolio so as to align appropriately with both risk exposure to new techno-geopolitical complexity and long-term value-generating may serve as a sound solution for resilience. The sheer size of the Chinese market may still attract many MNEs to stay in there but focus more in businesses, products and services that are less prone to techno-geopolitical risk (e.g. the Act did not impose geopolitical guardrail provisions on investment in the less advanced legacy chips). As MNEs each conduct a portfolio of businesses, geographies, and functions, portfolio resilience – vital for sustainable business success in a world of increasing uncertainty – merits greater scholarly attention.

Resilience becomes even more essential when global sanctions and regulatory risks are considered because escalated applications of sanctions and counter-sanctions across multiple jurisdictions are at the core of today's techno-geopolitical risk. Compliance with one jurisdiction's laws can risk running afoul of another's. Resilience in the face of the growing global weaponization of trade and investment requires not just having a precise understanding of ever-shifting regulatory regimes and a robust compliance capability but also driving a culture of compliance with the organization itself on an issue with no room for error (Witt, et al., 2023). Similarly, the job of scholars is to take a broader, systems-theoretic view and guide managers and boards as they navigate a bifurcated economy of a type that is now qualitatively different from what existed just a decade ago (Tece, 2022). One chief task, among many, for both scholars and practitioners alike is to address

resilience by integrating operational resilience (including technological, supply chain, and financial aspects) with organizational resilience (including structural, behavioral, and cultural aspects) and to identify new solutions that work for new circumstances facing specific MNEs. To minimize exposure to techno-geopolitical risks, for example, MNEs that have already operated in China may transform their wholly-owned subsidiaries or majority-owned equity joint ventures into cooperative alliances for less advanced semiconductor products.

Finally, *corporate diplomacy* is an important response, especially for those MNEs that have a high stake and power of influence in shaping techno-geopolitical conditions. This diplomacy differs from lobbying with legislative, regulatory and governmental institutions as it extends to representation, communication, negotiation, and other approaches that are often employed in the international diplomatic field (Doh, Dahan, & Casario, 2022). In fact, the Act itself is the product of strong lobbying by some US companies which wanted US government protection and funding (NPR, 2022). Viable corporate diplomacy must be carried out by representatives – senior executives and business diplomacy professionals at the headquarters, regional offices and critical foreign markets, and also shared by related departments such as government affairs, risk management, and communications. To the extent possible, leading technology players from developed countries can also work together and take joint actions to defuse some techno-geopolitical disruptions or foster collaboration with various stakeholders. MNEs can work collectively, as some already have, to influence governmental policies that would otherwise harm the firms at home and abroad. Yet determining which policies to advocate for requires due diligence. MNE executives may assess whether it is most effective to work in tandem with regulatory bodies through industry associations or to independently voice concerns specific to the company (Saha, Shirodkar & Lawton, 2023). In fact, the European CHIPS Act, after such collective efforts by technology MNEs in the region, focuses more on market rationality and market segments that leverage the EU's high-skilled workplaces and world-class research system, and in which the EU has either already developed a comparative advantage or will not find itself at an initial disadvantage (Hancke & Calvo, 2022).

Corporate diplomacy also calls MNEs to contribute to responsible globalization in their own ways. The United Nations Global Compact, a non-

binding, principle-based framework counting on many large MNE participants, stands as an example of the responsibility approach. The framework encourages businesses worldwide to adopt sustainable and socially responsible policies, stating ten principles in the areas of world peace, human rights, labor, the environment, value diversity, and social justice. The effort also illustrates that MNEs work together with UN agencies, labor groups, and civil society to tackle some imminent challenges. Respect for diversity also forms one of the UN core values and principles advocated for global companies. Still, MNE leaders should think of ways and take more action to flourish responsible globalization. For example, while digitization symbolizes the fourth industrial revolution, it induces many new risks, from cybersecurity attacks to disseminating extremist ideologies. Management teams of global companies are chiefly responsible for filtering such extremist ideologies, buffering ideological misperceptions, and being exemplars of good global citizenship.

Aligning Responses for Different MNEs

Techno-geopolitical uncertainty is likely to inflict varying levels of impact or damage on different MNEs because of varying exposure and vulnerability to such dynamics. The impact can be more keenly felt in locations and industries where geopolitical collision and techno-nationalism are uncontained. Semiconductor MNEs that depend more heavily on downstream activities like sales in China and/or more greatly on upstream technologies in the US will be subject to stronger impacts from the Act. Likewise, firms that have less control and weaker safeguards over their critical technologies and other key resources in this industry may be more immensely exposed to techno-geopolitical disruptions. Furthermore, the importance of global semiconductor ecosystems will remain, but companies holding weak bargaining power or weak network positions in such ecosystems are likely to be more susceptible to the hindrance from techno-geopolitical uncertainties. Also, we predict that when geopolitical ties between a firm's home and host countries (e.g., US and China, in the setting of the Act) becomes adversarial, the firm will inevitably face higher institutional, regulatory, and legal uncertainties and restrictions in these markets. Under techno-geopolitical uncertainty, collaborative global innovation networks, a globally organized web of complex interactions between firms and other organizations engaged in knowledge and



innovation development, will also be more difficult to operate and sustain. Techno-geopolitical disorder makes it harder for companies to mobilize global supply chain for technology and to leverage a global pool of talent, expertise, and resources. Future research is encouraged to validate these propositions.

Firm-specific variance in the vulnerability to techno-geopolitical disorder also calls for differentiated dedications to the above four responding strategies that should align properly with market dependence and technology dependence, as well as with company resources and capabilities to perform these responses. For instance, geo-strategies and reconfiguration could be more emphatic for firms whose market dependence and technology dependence on both China and the US are high. Corporate diplomacy may become more imperative for firms that must deal with a larger number of global and local stakeholders. Some companies may dedicate their diplomatic efforts toward legislative, regulatory, and governmental institutions; others may gear toward public, media, and local communities. Resilience may be emphasized for MNEs whose global value chain for semiconductor businesses is more internationally diversified.

Aligning a specific MNE's responses to techno-geopolitical conditions also requires us to expand our view of FDI strategies. Extant FDI research has placed much focus on one location, one timing, one entry mode at a given point in time, overlooking the portfolio and dynamic view that portrays FDI as an accumulative mass stock that comprises a myriad of investments in numerous countries and at various stages. Managing an FDI portfolio essentially means reconfiguration. Drastic changes in the techno-geopolitical arena propel the necessity for such reconfiguration. Restructuring strategies, such as downsizing, reallocation, spinning-off, and reshoring are rising as a key IB agenda during globalization in transition. Reconfiguration also implies that within the same critical host market like China or the US, an MNE may exit from or downsize certain businesses or activities but at the same time enter or enlarge others. This is viable and vital since the shift to illiberal policies by the US administration and its allies is industry-specific, with continued openness to trade in less-sensitive or low-end technologies and less strategic sectors (e.g., consumer products). Figure 1 synthesizes our overall view toward the Act and its implications for both MNE theories and MNE actions.

WHAT DOES IT IMPLY FOR IB RESEARCH?

While the Act signals a paradigm shift from liberalism to realism in US policymaking, its implications for IB theories remain to be seen, but the IB community needs to watch it closely. IB theorists have developed a wealth of perspectives based on principal assumptions of liberalism – an open rules-based system, global economy integration, technology sharing, and global value chain interconnections – which may need to be revised or enriched. We believe that the deep-rooted narratives that underpin the Act calls for a reassessment of theories regarding the nature and drivers of techno-geopolitical uncertainty.

IB theories have long acknowledged the role of market imperfections, liabilities of foreignness, governmental interference, trade protections and barriers, political risks, and socio-cultural-ideological distances in influencing IB strategies, decisions, and behaviors (see Rugman, 2009). These perspectives remain useful to study techno-geopolitical uncertainties in conjunction with emerging forms of techno-nationalist measures. The political risk theory (Boddewyn & Brewer, 1994; Miller, 1992) also remains valuable to guide research on techno-geopolitical disruptions to the extent that the prior framework of IB risk management is still instrumental to dissecting dynamic processes of managing political challenges at global, regional, and national levels. And cost-based theories, notably, transaction cost economics and information processing, remain useful in a way that illiberalism-caused techno-geopolitical uncertainty can be diagnosed by the MNE's alignment between its governance choices (e.g., internalizing, regionalizing, reshoring, friend-shoring, etc.) or information processing capability and its external environment conditions.

That said, techno-geopolitical uncertainty triggered by the US CHIPS Act increases new demands and opportunities for IB theory enrichment. Extant IB scholarship has often observed such uncertainty with a polarized view, either over-emphasizing conflicts and security concerns (realism) or ignoring geopolitics (liberalism) (Farrell & Newman, 2020). This leads to a lack of understanding of a fuller picture of transitioning globalization, a reality that holds even between the US and China (e.g., Allison, 2017; Li, et al., 2022). This transition occurs for cross-border exchanges between states, between blocs of countries, between ecosystems,

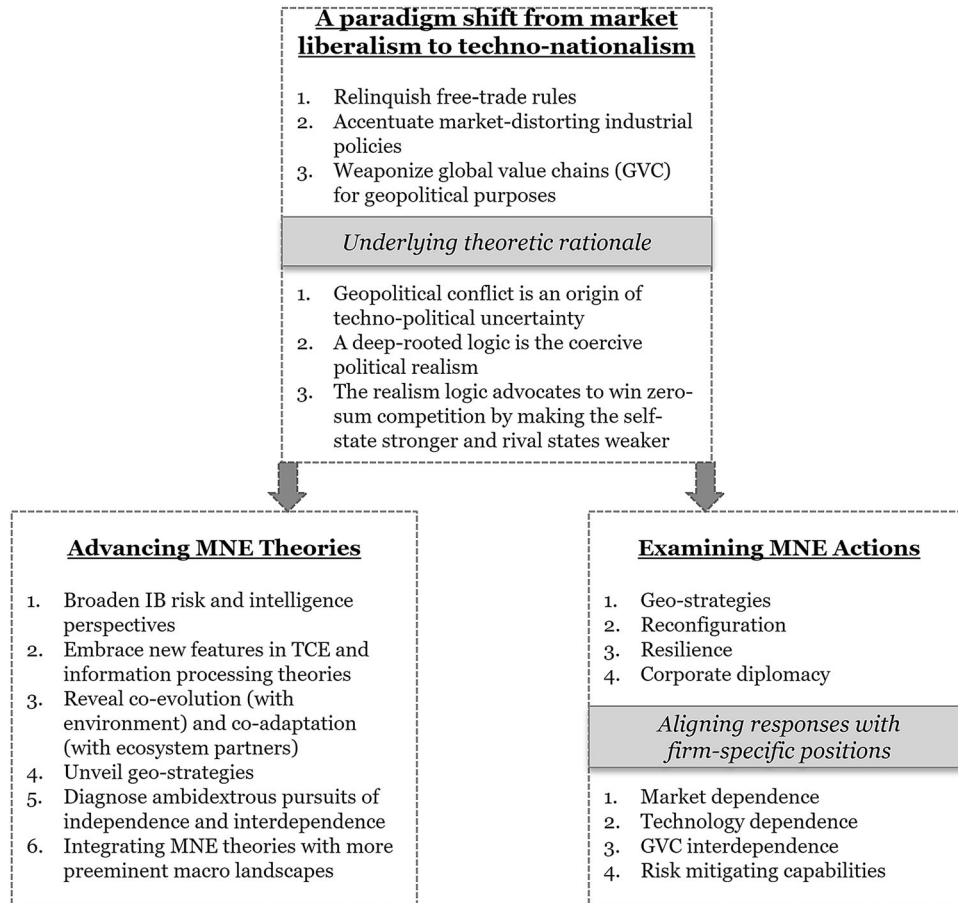


Figure 1 A paradigm shift from market liberalism to techno-nationalism.

and between firms, with a range of new causes, rationales, and forms to be tackled by IB researchers. Moreover, the Act furthers bifurcation, compelling many MNEs to prepare dual global strategies – one tailored to China and its allies and the other to the US and its alliance – or opting to only operate in one of the blocs. MNE theorists have addressed differentiating strategies across regions or nations (e.g., Bartlett & Ghoshal, 1989), but stayed short in articulating bifurcation complexity and how MNEs deal with it. Techno-geopolitical uncertainty is likely to make the transnational solution difficult to implement, and incompatibility of bifurcation-related dual strategies makes global integration costly to achieve. Theorizing global integration thus needs to be linked with global value chain restructuring in a fashion that allows the MNE to minimize both its exposure to techno-geopolitical uncertainty and its needs for integration while continuing their operations in the US and China.

IB scholarship should also extend the concept and scope of political risks. Scholars in the field have since long considered political factors and host government policies but they have largely neglected the underlying, subtle geostrategic dynamics at the bilateral, multilateral, and global levels. In other words, IB scholars have lacked imagination on the factors that drive structural breaks in the global business environment. When extending political risk to geopolitical risk, it helps scholars and practitioners alike to distil interplays between political, economic, diplomatic, ideological, and cultural issues within the same framework and to comprehend such interplays not just from a single country (home or host) but from a holistic or global lens. In addition, the IB community may benefit from integrating international political science with IB theories (e.g., Li et al., 2022; Meyer & Li, 2022; Witt, 2019). The deepened complexity stemming from the weaponization of global value chains mandates a conjoining of international



politics with international business in ways that comprise a fundamentally new and more inclusive paradigmatic approach. Also, the IB field can revitalize its existing theories by incorporating geostrategic intelligence and processes into firm-specific and difficult-to-substitute critical capabilities. Geo-strategies (e.g., corporate diplomacies) by MNEs are particularly imperative when the two governments (US and China) misconceive each other's intentions while highly depending on each other to solve common challenges. To fulfil this objective, insights into processes by which to establish such capabilities will be prized.

IB theories have long built on an assumption of cross-border flows and utilization of critical resources, such as technological and human resources, for their globally integrated operations. Yet, the Act appears to cement interfered globalization – more complexity, more regulations, and more emphasis on national security and zero-sum competition – as well as fragmented globalization – growing geopolitical, economic, and even socio-cultural tensions between blocs or countries that are often divided by competing or contradicting ideologies and values (Luo, 2022). For human resource management, for example, MNEs traditionally reliant on global talent pools are suffering or facing new complications when techno-geopolitical uncertainty increases. This uncertainty prompts many US and Western MNEs in high-tech sectors to onshore their workforce, especially high-skilled STEM (science, technology, engineering, and mathematics) talent, and restrain hiring talent from rival nations (Ernst, 2021). This implies a new demand for IB research in human resource management to look into new challenges and working solutions in managing various issues relating to global talent, cultural diversity, and strategic human resources management.

CONCLUSION

The future of the international liberal order hinges on the ability of major geopolitical and geoeconomic powerhouses, the US and China in particular, to lead and support it, yet recent policy actions such as the US CHIPS and Science Act suggest that the US government's willingness to assume this leadership role is wavering. The Act embraces subsidies that would likely be disputed at the WTO which has played a crucial role over the past 25 or so years in mediating international trade disputes and preventing damaging cycles of tariffs

and retaliation outside internationally agreed upon rules and arbitration. Subsidies are expected to cause significant material injury to foreign chips producers that will have to compete with US-subsidized products in foreign markets. The Act is also openly mercantilist by requiring firms that receive funding to decouple their global value chains from China. Taken together, the Act spells a move towards geopolitical techno-nationalism in American IB policy. This opens a rich avenue for IB scholarship to dive more deeply widespread implications of such a paradigm shift from liberalism which appreciates interdependence (and globalization more broadly) to realism which depreciates openness (and prioritizes nationalism more broadly).

The Act signifies a strong shift to resort to techno-nationalism after decades of neoliberal globalization, open trade, and multilateral order, representing a critical moment of change in the dominant logic behind IB (trade, investment and global value chain, etc.). Nonetheless, this geopolitical (new) techno-nationalism, which stresses the primacy of geopolitics in global business, differs from developmental (conventional) techno-nationalism adopted in many (especially emerging) economies for decades (e.g., Japan, China, South Korea, India, Singapore). Geopolitical (new) techno-nationalism is a new strain of protectionist and nationalist thinking that links domestic technologies directly to the state's national security and geopolitical gains, whereas developmental (conventional) techno-nationalism is viewed as a mercantilist thinking aiming at strengthening a state's competitive advantages by sharpening its technological capabilities for economic prosperity. In many regards, these two techno-nationalism systems, which co-exist today, are competing and incompatible, making it difficult for MNEs to adjust and adapt. This difficulty itself warrants more IB inquiries through resilience, reconfiguration, and realignment lenses.

It may be too early to conclude that the Act signals the end of the liberal international order. The US decision to take up geopolitical techno-nationalism has in large part been a reaction against China's own techno-nationalism, and this leaves room for negotiation between the two geopolitical rivals. It is unlikely that either the US or China want to see complete decoupling or the collapse of the multilateral system due to the high economic costs that would impose on themselves. Both parties may therefore be willing to limit the

most extreme forms of beggar-thy-neighbor mercantilism, while preserving the legitimate quest for countries to protect national security. They may choose to keep the principles of openness, rules and multilateral collaboration that are at the heart of the liberal international order from which they both benefited, while allowing more latitude in the design of industrial policies. Considering the current tensions between both countries, however, such a negotiation will not be for tomorrow, implying that techno-geopolitical uncertainty will be around for the foreseeable future. IB scholars shouldn't wait and instead must foresee various consequences resulting from different scenarios regarding the evolutionary ties between the world's largest economic powerhouses. In particular, it warrants inquiries into broader outcomes that affect not merely MNEs operating in these two countries but extended to MNEs in other countries as well.

In the meantime, MNEs will need to carefully consider how the new techno-geopolitical uncertainty influences their global operations and management. Several strategic responses from lenses of geo-strategies, reconfiguration, resilience, and corporate diplomacy we outlined may provide a first line of defense that MNEs will need to adopt to deal with the new global reality. As stated, such responses must also align properly with firm-level specifics such as varying levels of risk exposure, technology dependence, global integration, and international experience. Still, there are various challenging issues to be tackled by IB scholars as geopolitical fracture is continuously exacerbated by one event after another. As populism and authoritarianism rose in parallel and in confrontation, the existing world order was imperiled, resulting in constant new challenges for MNEs. As we stated, political realism and zero-sum thinking, now the dominant doctrine to handle geopolitics in numerous countries, escalates (if not originates) the world order fracture. The impact of such fracture and related tensions on the global economy, international order, and international businesses will reverberate for years, even decades, to come, presenting many important questions for IB scholars to ruminate.

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NOTES

¹Throughout the paper, we will use the terms the US and China to represent the countries' governments, not necessarily their people. There are tremendous differences between governments and people in both countries (and in other countries).

²The US considers free world values to be the principles of freedom, democracy, human rights, and the rule of law, which are not universally accepted by all countries. It is important to note that the liberal international order has its dark sides. For example, it has been widely documented that the liberalization of trade and investment has resulted in lost jobs and rising income inequality throughout the liberal world.

³The establishment of the US House China Select Committee illustrates this. The Committee's mandate is to assess all aspects of military, economic, geopolitical, technological, and diplomatic challenges.

⁴History shows that the U.S. government attempted in the 60s to influence and curtail the operations of home country MNEs, yet such attempts did not have any greater impact on the long-term trend towards liberalization and globalization (see Rollings, 2015). If this repeats in the aftermath of the Act, then the Act may not with certainty herald a full paradigmatic shift.

⁵Diplomatic initiatives, such as the U.S.–EU Trade and Technology Council (TTC), signal a high-level transatlantic interest in coordination and trust-building on issues related to supply chains. The two sides committed to “reduce dependencies on unreliable sources of strategic supply” and to “mitigate jointly the negative effects of sudden supply chain ruptures” while lowering a myriad of other trade barriers. The challenge, of course, will be transforming this commitment into action.

⁶Sullivan, J. 2022. Remarks by National Security Advisor Jake Sullivan at the Special Competitive Studies Project Global Emerging Technologies Summit.



⁷For instance, Taiwan's TSMC, which is the world's largest contract chipmaker, is investing US\$12 billion to build a wafer plant in Arizona, using the advanced 5-nm process. UMC (United Microelectronics Corporation), the world's leading semiconductor wafer foundry from Taiwan, responded by launching new investments in Japan.

⁸The United States in the end did not join the Trans-Pacific Partnership.

⁹Alluding to the US reaction after the Soviet Union's launch of the Sputnik satellite in 1957, a Sputnik moment refers to a time when a nation experiences a sudden shock or awakening to the realization that it is falling behind in a particular field or area of technological or scientific advancement.

¹⁰The US administration has undertaken actions to reassure strategic partners in East Asia for this purpose. Diplomatic, economic, and security arrangements like the Indo-Pacific Economic

Framework for Prosperity (IPEF), the Quad (the US, Australia, Japan, and India), and the U.S.–Taiwan Initiative on 21st-Century Trade illustrate this.

¹¹Those are all legitimate concerns, but only symptomatic of a larger problem. The problem is that the broader conditions necessary to sustain a rules-based multilateral trading system predicated on the principles of “most-favored nation” and “national treatment” no longer exist. Numerous large economies in the WTO have committed to courses of action that disregard these principles.

¹²Haier, the Chinese multinational home appliances and consumer electronics company, quickly rebounded from a series of external disruptions in recent years by building many microenterprises – self-managing business units that make their own rapid adjustments to stay afloat in times of crisis.

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