



I. INTRODUCTION

The article "The Sources of China's Innovativeness" discusses how China has transformed from a perceived copycat to an innovation powerhouse. It identifies "Five Virtues" that have contributed to China's success in innovation, however, notes that China's future success is not inevitable and depends on a mix of domestic policy choices and developments in the international environment.

Certain reasons for China's emergence are discussed below in order to analyze various aspects contributing to China's growing role as a global innovation center, which allows for a broader understanding of China's strengths and weaknesses.

The main focus is to analyze the factors that have contributed to China's transformation into an innovation powerhouse and to discuss the implications of this transformation for Western countries.

The Five Virtues of China's Innovativeness

- **A skillful modulation of protectionism in a large market:** China has leveraged the scale of its market and its degree of protectionism to absorb new trends from the West while protecting infant Chinese technology firms.
- **Attracting knowledge into the country:** China has attracted knowledge and technology transfers by various means, including the return of Chinese scientists from abroad, forced technology transfers, and becoming an integral part of global supply chains.
- **Liaison with Western actors:** Despite its goal of self-reliance, China has deep ties with private sector actors and research institutions in the West, which includes importing Western-made cutting-edge technology, targeted acquisitions of know-how, and long-term collaborations with Western universities.

- **Party-state guidance instead of control:** The role of the party-state in China has shifted from controlling to guiding economic activity, signaling central party-state priorities to a broad set of actors, and encouraging experimentation in fields such as technology.
- **Domestic competition with Chinese characteristics:** China has fostered a competitive environment that encourages innovation, with state-owned enterprises (SOEs) playing a significant role.

II. VIRTUE 1: POROUS PROTECTIONISM OF A HUGE MARKET

Upon discovering the permeability of the Great Firewall, which serves to filter out undesired content from China's internet, external observers are often puzzled by its effectiveness. This permeability is not due to a lack of Chinese capability, but rather a deliberate calibration of protectionist measures. For the last twenty years, China has strategically capitalized on both the vastness of its market and the extent of its protectionist policies. The allure of China's market, with its 1.4 billion population and an estimated middle class of around 400 million in 2017, has been incredibly compelling for foreign enterprises, including major tech firms. The potential opportunities presented by the immense Chinese market have outweighed the protectionist barriers put in place by the People's Republic of China (PRC). The vision of what could be achieved in this market has eclipsed the challenging conditions that technology companies encounter within the PRC.

A. Key Points:

China has leveraged the scale of its market and its degree of protectionism to absorb new trends from the West while protecting infant Chinese technology firms

It highlights that China's large, semi-protected market has been a key factor in its rise as a technological powerhouse with approach to becoming innovative is substantially different from the Western approach.

It finds that China has managed to accomplish this feat even as its government has tightened controls on markets, speech, and politics and suggests that to keep the United States competitive, Washington should explore certain elements of China's strategy, including a willingness to experiment with pro-innovation policies

III. VIRTUE 2: ATTRACTING TECHNOLOGY AND KNOWLEDGE TO CHINA

As China's economic conditions and quality of life improved, Chinese scientists and researchers who had trained and worked in the West increasingly chose to return to their homeland. This trend was not solely due to China's growing appeal but was also driven by targeted talent recruitment programs, such as the prominent Thousand Talents program and its counterpart for younger professionals, the Young Thousand Talents program. These initiatives, overseen by the CCP's United Front Work Department's Western Returned Scholars Association, offered incentives like prestigious titles, competitive salaries, visa benefits, and generous research funding. Between 2008 and 2018, these programs reportedly enticed around 7,000 scholars to return to China. While an

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evaluation of the Young Thousand Talents program acknowledged its effectiveness, it also noted a shortfall in attracting top-tier academic talent. Despite varying opinions on the extent of China's success in this area, Western security agencies have expressed concerns about the transfer of knowledge that could potentially enhance China's military capabilities.

A. Key Points:

China has attracted knowledge and technology transfers from abroad, including the return of Chinese scientists, forced technology transfers, and integration into global supply chains that has been a key factor in its rise as a technological powerhouse

Many Chinese tech giants have continued to import Western-made cutting-edge technology, knowing only too well of its superior quality.

China has managed to accomplish this feat even as its government has tightened controls on markets, speech, and politics

United States should explore certain elements of China's strategy, including a willingness to experiment with pro-innovation policies

IV. VIRTUE 3: LIAISON WITH PRIVATE TECH AND RESEARCH IN THE WEST

China's ambition for indigenous innovation does not negate its reliance on the West for technology and knowledge. This reliance, termed the Third Virtue in the context of China's innovation strategy, encompasses a multifaceted approach. Firstly, China aims for self-reliance by seeking to replace foreign technologies with domestic alternatives. Despite this goal, Chinese technology giants continue to import Western technology due to its superior quality. This dependency became especially evident when Western sanctions targeted Chinese tech firms, highlighting the irony of China's self-reliance ambition. As a result of these sanctions, Chinese consumer electronics companies like Oppo, Vivo, and Xiaomi have increasingly turned to domestic suppliers, either because of restricted access to Western technology or in anticipation of broader sanctions. This shift has significantly benefited domestic semiconductor manufacturer UNISOC, which saw its global chipset market share surge from less than 3 percent to over 10 percent between 2019 and 2022.

A. Key Points:

China, despite its political goal of self-reliance, relies on deep ties with private sector actors and research institutions in the West

These ties are part of China's strategy to become as self-reliant as possible by replacing foreign manufactured high-tech products with indigenous innovation

It also implies that the West's approach to restricting technology transfer to China may not fully stifle China's innovation capabilities, as the country has already internalized much of the knowledge and continues to engage in international collaboration

A major takeaway is that China's innovation strategy is multifaceted, involving both the development of domestic capabilities and the strategic use of Western technology and knowledge

Western policies aimed at curtailing China's technological advancement need to consider the nuanced and interconnected nature of global innovation ecosystems

V. VIRTUE 4: THE GUIDING ROLE OF THE PARTY-STATE

While central planning is often viewed as a hindrance to creativity and innovation, China's approach to planning has evolved significantly from the era of Mao Zedong's strictly controlled economy. The current Five-Year Plans (FYPs) implemented by China are not exhaustive economic directives but rather strategic frameworks that set out the central government's priorities for a broad range of actors, including the private sector, subnational party-state entities, and state-owned enterprises. These FYPs initiate cycles of planning and execution that span five years, during which time they guide economic activity without micromanaging it. Subnational and sectoral plans further detail these priorities by region and economic sector, yet they remain sufficiently broad to allow for interpretation and flexibility in their implementation. This flexibility encourages local officials to experiment, particularly in technology sectors highlighted by the FYPs. Targeted deregulation within these sectors is also used to foster innovation. In this way, the party-state's planning in modern China is less about strict control and more about political signaling, providing direction while enabling innovation at the subnational level.

A. Key Points:

The role of the party-state in China has shifted from controlling to guiding economic activity

The party-state signals central priorities to a broad set of actors, encouraging experimentation in fields such as technology

The party-state's guidance has been instrumental in fostering a competitive environment that encourages innovation

It also suggests that the party-state's guidance has been instrumental in fostering a competitive environment that encourages innovation

VI. VIRTUE 5: INTERNAL MARKET COMPETITION WITH CHINESE CHARACTERISTICS

The intense competition within its borders, which, while different from Western competition, is a key driver of technological progress. The primary force propelling China's digital technology sector forward has been the emergence of private companies established by entrepreneurs. Among the top five Chinese software companies—Huawei, JD.com, China Mobile, Alibaba, and Tencent—only China Mobile is state-owned. The rest were started by private individuals, with Tencent even receiving backing from U.S. venture capital. While these companies have undoubtedly benefited from the support of the party-state, the entrepreneurial spirit and decisions of their founders have been crucial to their success. These "red entrepreneurs" must navigate close ties with the government, but

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they remain competitive businesspeople striving for market dominance.

A. Key Points:

The competitive environment fostered by China, with state-owned enterprises playing a significant role. It also argues that this competition, characterized by a mix of state and private enterprises, is unique to China and has been instrumental in driving innovation and growth.

VII. OBSTACLES

The Five Virtues have made China innovative but each faces its own challenges. Five Obstacles, one for each of the Five Virtues, put the sustainability of China's evolution to an innovation powerhouse at risk. Analyzing these obstacles helps to evaluate the PRC's prospects for remaining innovative. Will the PRC's authoritarian political system ultimately stall China's development? Is China doomed to fail? Or has the PRC found a "magic formula" from among the Five Virtues? Is the country now on an inevitable path to success?

VIII. OBSTACLE 1: GROWING PROTECTIONISM

China's huge market is still characterized by semi-protectionism. In recent years, however, several domestic policies have restricted the cross-border flow of information and knowledge. In 2018, China's Ministry of Industry and Information Technology announced VPN services that circumvent the Great Firewall would in the future require governmental approval. This made most of the widely used VPN services illegal. Several VPN services have since been closed, suspended or had to pay high penalties for violating China's Cybersecurity Law.

A. Key Points:

Protectionism involves countries discouraging imports of foreign goods and services through tariffs, quotas, or other trade restrictions.

Common arguments supporting protectionism include national security, protecting consumers, safeguarding jobs and industries, and nurturing infant industries.

Growing protectionism is raising concerns about the future of globalization and the potential negative impacts on the global economy.

Economists and policymakers often reject protectionism as a solution to economic challenges, advocating instead for redistribution from winners to losers of global trade.

The debate on the value of protectionism is ongoing, with arguments both for and against it based on its impact on jobs, GDP, and domestic competitiveness.

Any policy response to the risks in the current global trading system must grapple with the complex interplay between trade patterns, country-specific factors, and the need for reforms and institutions that support productivity and flexibility.

IX. OBSTACLE 2: MARKET ENTRY BARRIERS

Just as China has tightened control over its semi-protected market, the PRC has also complicated market access for foreign companies to China. More generally, the securitization of

economic affairs in China is the Second Obstacle to Chinese innovativeness and challenges China's Second Virtue. For example, a revised version of the Counterespionage Law of 2023 drastically expands the law's definition of espionage. An ambiguous definition of national security secrets could end up penalizing traditional business activities. The data required for traditional equity research to assess risk could easily be considered of national interest and its handling could be criminalized. This could have enormous chilling effects that reduce any cross-border cooperation that requires significant amounts of data, including economic and technological exchange.

1) Key Points:

Market entry barriers refer to obstacles that make it difficult or costly for new firms to enter a market

These barriers can include economies of scale, brand loyalty, government regulations, and patents or proprietary technology

High start-up costs or other obstacles can prevent new competitors from easily entering an industry or area of business

Barriers to entry may be set by government policy, created due to high financial cost, or occur naturally due to the industry itself

It also argues that these barriers can protect incumbent firms and their market share, potentially leading to market dominance and monopolistic behavior

Policymakers need to consider these factors when designing regulations and policies to foster a competitive and innovative market environment

X. OBSTACLE 3: HOSTILE ENVIRONMENT

Economic and technological dependencies are increasingly being perceived as potential threats. "Weaponized interdependence" has superseded the traditional interpretation that mutual dependency is a stabilizing force in international affairs. Several Chinese policies reflect this securitization trend. Of particular importance to the growing isolation of China could be the introduction of the PRC's Intelligence Law of 2017, article 7 of which requires all Chinese entities to cooperate with the PRC's security services if requested. This has raised suspicion and concern in the West. For example, trusted relations of research cooperation have been called into question because Chinese cooperation partners would be required by law to disclose information to the Chinese security agencies on request. In 2023, such concerns were further fueled when China's Ministry of State Security publicly called on all Chinese citizens to engage in counterespionage activities.

A. Key Points:

A hostile environment refers to conditions that are unfavorable or challenging for businesses or innovation

These conditions can include regulatory barriers, intense competition, lack of resources, or political instability

Companies operating in a hostile environment need to develop strategies to survive and thrive, such as innovation strategies or trust-building strategies

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Companies can survive in a hostile environment by using specific strategies, such as innovation strategies or trust-building strategies

It also argues that companies can overcome these challenges through specific strategies, such as innovation strategies or trust-building strategies

However, companies can overcome these challenges through specific strategies, demonstrating the resilience and adaptability of businesses

XI. OBSTACLE 4: CENTRALIZATION OF CONTROL IN TIMES OF CRISIS

While China is still far from the days of the planned economy under Mao Zedong, there are visible centralization trends. Most prominently, a new Central Commission for Science and Technology was announced in March 2023 under the Central Committee of the CCP to be led by paramount leader Xi Jinping. This is a clear sign that Xi Jinping aims to tighten control over science and technology policy throughout China. Such a tightening of control comes at a time of economic crisis. A looming bursting of the real estate bubble has put China's financial sector under enormous stress. As a result, state-owned banks are likely to lend out fewer resources. Hence, the guiding function of the party-state – unleashing enormous resources for innovation – is coming under pressure from centralized control and fewer resources in the system.

A. Key Points:

Centralization of control in times of crisis can lead to a more coordinated and unified response to immediate challenges.

This centralization may involve setting goals, prescribing roles and authority, and identifying rules to maintain structure and order.

However, centralization can also lead to disruptions and challenges to identity within organizations or social systems.

Centralization can result in "Pressure, Tension, Disruption, and Conflict" as organizations and individuals navigate changes in authority and decision-making processes.

The amount of centralization can impact the environment in which participants operate and behave, affecting the diffusion of technology and innovation.

XII. OBSTACLE 5: INJECTING INSECURITY

The Fifth and final Obstacle is growing insecurity in China, in both the technology sector and more broadly in society. This all began with what has been called the "rectification" of private sector companies in the technology sector, most prominently Alibaba and the company's founder, Jack Ma, but also Tencent and Didi. These and other companies have been subject to various investigations that were widely interpreted as a clampdown on private sector companies that had become too influential from the perspective of the CCP leadership. Regardless of whether this interpretation is correct, the rectification of the platform economy has injected uncertainty into the sector and could discourage entrepreneurs from taking risks. CCP leaders are now seeking to reassure private tech entrepreneurs and have signaled that the rectification has come to an end. Whether such reassurances will eliminate the sense of insecurity among China's -private sector entrepreneurs remains to be seen.

A. Key Points:

Injecting insecurity refers to the introduction of uncertainty or instability into a system or environment

This can be caused by various factors, including changes in policy, market fluctuations, or geopolitical tensions

Injecting insecurity can lead to a more cautious approach to innovation, as businesses may be reluctant to invest in new technologies or processes in an uncertain environment

The injecting insecurity can be a significant obstacle to innovation, as it introduces uncertainty and instability into the business environment

Injecting insecurity can present significant challenges to businesses and innovation, introducing uncertainty and instability into the business environment

However, businesses can overcome these challenges through adaptability and resilience, demonstrating the potential for innovation even in the face of insecurity