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THE GLOBAL IMPACT OF MADE IN CHINA 2025

Prof. Alberto Petrucci

SUPERVISOR

Silvia Chen 270631

CANDIDATE

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INTRODUCTION

This research focuses on the global impact of "Made in China 2025" (MIC 2025) initiative, a strategic plan, launched in 2015, aimed at transforming China from a low-cost manufacturing center to a leader in high-tech industries. The policy focuses on innovation and development in ten high-end sectors, in which foreign countries currently hold a dominant position. This strategic shift is reshaping global supply chains and competitive dynamics and has triggered substantial responses from major economies, which have implemented trade barriers and regulatory measures to counter China's expanding technology.

This investigation is critical because technological innovation is increasingly at the heart of modern economic success and geopolitical influence. Countries leading in cutting-edge technology can control supply chains and gain strategic advantages. In today's increasing interdependency among nations in the world economy, countries try to strive more competitively than others, especially in the high-tech industry. Understanding MIC 2025 is essential for grasping how China's rise in the high-tech sector could reshape global trade and geopolitical dynamics.

Why did China feel the urge to launch MIC 2025? The explanation lies in its traditional manufacturing, with low-value products in many industries and often heavily dependent on foreign technology. As the world moved toward more advanced and knowledge-driven industries, China understood that its manufacturing approach needed an upgrade to avoid the middle-income trap and remain globally competitive.

Moreover, China's competitive edge in the global market has resided its low labor costs, making it an attractive destination for labor-intensive manufacturing. However, as wages have risen over time, Chinese economy has started to lose its cost competitiveness. This shift has pushed China to focus on the development of higher-value industries that are less dependent on low-cost labor and more reliant on technological innovation.

This work is conducted on the analysis of the Global impact of MIC 2025, and it is divided into three chapters. The first chapter delves into the transformation process of China's economy over the past 40 years, primary focusing on its shift from a labor-intensive to a more innovation-driven economy. This is achieved through a series of policies, such as government subsidies, talent recruitment, increase in R&D. It is also illustrated the successful cases where China has recognized a potential growth-the NEVs and telecommunication markets.

The second chapter discusses the international community reactions of The United States, the European Union and Japan to China's technological path promoted under MIC 2025, by investigating the underlying trade patterns of each counterparty with China and the consequences on their response.

The concluding chapter shows the changes brought by MIC 2025 on the Chinese economy, in terms of global value chain integration, social, financial, and environmental influence. By evaluating these transformations, this research aims to provide a comprehensive analysis of how MIC 2025 is reshaping not only China's economy but also the global economic order, offering insights into the future trajectory of international competition and cooperation in high-tech industries.

CHAPTER 1: COMPETITIVENESS OF THE CHINESE ECONOMY

1. A TECHNOLOGICAL PATH TO GLOBAL COMPETITIVENESS

In the past forty years, China has experienced massive economic growth by becoming one the main manufacturing countries in the worlds. The comparative advantage of the Chinese economy has relied in the past forty years on cheap labor costs.
The introduction of economic reforms under Deng Xiao Ping in the Chinese economy starting in the late 1970s is one of the key determinants of the cheap labor costs in China. [1] The reforms were extremely fundamental in transitioning China from a centrally planned economy to a more market-oriented one; this includes reforms on opening to foreign investments. For example, through the creation of Special Zones, such as Shenzhen, that created favorable conditions for foreign investment with tax incentives and more relaxing regulations, many multinational enterprises were attracted by the cheap manufacturing cost in China. New industries were created and demand for labor, even at low wages, rose.

This period was accompanied by a massive flow of peasants migrating from the countryside to the urban area, in search of job opportunities in the new modern and capitalist sectors. Many workers were migrating from rural areas, where the living costs were minimal, and wages were traditionally lower than in industrial zones. This was not possible in the pre-reform Chinese economy, as The Hukou system restricted labor mobility from the countryside to guarantee that labor efforts cultivate enough grains (Maarten Bosker and al.,2012) After China's integration with the World Trade o in 2001, Chinese policy loosened restrictions on labor mobility; it is observed a gradual increase of migration flow over the years, when workers from the countryside started to move to cities from 25 million in 1990 to 159 million in 2012, becoming the biggest human migration ever documented in history in such a brief period.(Athukorala e Wei, 2018, p. 424). The flow of migration created a massive supply of labor force, consequently leading to lower wages and since the working force was made up of peasants, the underdevelopment of the labor force and their low skill was another driver for the cheap manufacturing cost.

Furthermore, there was a serious lack of labor rights and protection in the early economic reforms stage that contributed to maintaining cheap labor cost. This meant there were fewer legal requirements governing working conditions, safety standards with respect to developed

[1] See World economic outlook: A survey by the staff of the International Monetary Fund,1997

countries and there were no enforced minimum wage laws; this absence made the workforce accept wages that are at subsistence level.
However, nowadays many economists have questioned whether cheap labor costs can be still an advantage for the Chinses economy. Athukorala e Wei in[2] stresses the importance of labor supply in shaping the direction of China's future economy. If labor supply decreases, China must transition to a new policy setting focused on a capital-intensive business model, such that the technological progress enables a sustainable growth for the country.

This period of rapid economic growth, which contributed to China to build the solid foundation as one of the biggest economic powers in the world, has been driven also by significant investment in infrastructure and policies that favor export-oriented manufacturing. However, while the Chinese economy experiences accelerated growth, it also exhibits remarkable weaknesses.

Following the pace of developed industrial countries, where the total factor productivity has been one of the main contributions of economic growth, and especially of good-quality and sustainable growth, China realizes that a change must be made to achieve the same type of growth. Past decades of accelerated expansion have notably conquered quantitative growth to catch up with the developed countries, often causing imbalances. (Zhang Ping and Nan YU, 2018). According to official datas[3], the GDP growth rate from 1978 to 2002 was 9.70% and after has maintained an almost equally until 2016. This figure has guaranteed China the first position in the world.

Table 9: Decomposition of Production Function

	1978-2018	1978-2007	2008-2018
[1][Three potential growth (production function fitted) factors	9.50	10.03	8.08
[2] Capital input (K): elasticity	0.635	0.636	0.631
[3] Share of capital contribution=([2]×[8])/[1]	71.69%	64.83%	87.05%
[4] Labor input (L): elasticity	0.365	0.364	0.369
[5] Share of labor contribution=([4]×[11])/[1]	8.73%	11.84%	2.23%
[6]tfp: growth rate	1.86	2.34	0.866
[7]share of tfp contribution=100-[3]-[5]	19.58%	23.33%	10.72%
[8] Capital input growth rate(k=dK/K)=[9]×[10]	10.99	10.96	11.04
[9](Net) investment rate (I/Y)	45.44	39.31	130.76
[10] Capital efficiency (Y/K)	0.242	0.302	0.079
[11] Labor input growth rate (l=dL/L)=[12]+[13]	2.272	3.263	0.504
[12] Growth rate of working-age population (pop_i)	2.603	3.709	0.657
[13] Change in labor participation (θ_L)	-0.331	-0.446	-0.153
[14] Growth rate of labor productivity(y=Y/L)=[15]+[16]	3.741	3.88	3.433
[15] Growth rate of capital efficiency (Y/K)	-5.429	-4.765	-7.12
[16] Growth rate of capital per capita (K/L)	9.17	8.645	10.553

[2] See “Economic transition and labor dynamics in China.”,2018

[3] source: the World Bank WDI database

However, this growth does not imply improvement of quality and efficiency. From this table it is possible to observe that in the past years Chinese growth was fueled by a large amount of physical capital, such as machinery, infrastructures. These reforms increased output for the economy but are in contrast with improvements in technology and innovation, skill labor. The table shows in fact that the capital input growth rate between 1978 and 2008 was around 11% and that total factor productivity -share is the least compared to capital contribution to the output growth. Another striking number is reflected by the capital efficiency, which diminished from 2007, transitioning from 0.302 to 0.079. This is because of China's heavy reliance on capital investment and the consequent return to capital.

Notably, Chinese companies have predominantly operated in lower-end market segments and have concentrated on labor-intensive and resource-consuming production. The economy is marked by a weak innovation capability. This dependency has limited economic growth in the long run and made the Chinese companies fall behind their international counterparts in technological advancement and brand recognition. A new growth path must be defined to pursue higher capital productivity and in general economic resilience.

The "Made in China 2025" plan might become a solution to this problem. The Mic 2025 is an ambitious strategy that targets the development of advanced manufacturing technologies, aiming to become the leader in the global manufacturing power in the high-tech industry; independence from foreign technology and the leading in the innovation sector are the focus of the plan, ensuring Chinese global competitiveness in the face of rapid globalization and technological advancements.

The Belt and Road Initiative (BRI), a global policy introduced in 2013 that aims at enforcing the interconnectedness between Europe and Asia, by building a strong transportation network and encouraging economic cooperation, has laid the foundation for MIC 2025. Even though the BRI and MIC 2025 focus on different tasks, their connection enhances the Chinese technological stature on the global stage and can create a synergistic relationship. On one side, the infrastructure and trade networks established through the BRI provide new markets and opportunities for Chinese high-tech products and innovations developed under MIC 2025.Moreover, this expansion enables Chinese companies to export their high-tech products more effectively and increases the global footprint of Chinese technology. According to the results reported by the paper [4] ,BRI has increased Chinese exports in the targeted countries and the export expansion involves mainly capital-intensive industries rather than labor and resource intensive, indicating a further incentive for the high-tech industries development. On the other hand, the innovation and high-tech products promoted by the MIC 2025 ensure

[4] See "Does the belt and road initiative expand China's export potential to countries along the belt and road?" Linhui Yu, Dan Zhao, Haixia Niu, Futao Lu,2020

that the infrastructure projects initiated under BRI are built using high-quality and cutting-edge technology, which are essential for the construction of high-speed rail and the development of the telecommunications infrastructure.

2. CORE OBJECTIVES AND STRATEGIES

Despite the Chinese economy's achievement in the manufacturing industry over the past 40 years, however, there remains a noticeable gap in technological innovation level compared with the developed countries; this disparity is primarily due to the lack of independent capability of innovation, particularly induced by lack of R&D investment in Chinese firms. According to Official records, the R&D ratio with respect to the sales revenue was 1.01% for Chinese manufacturing firms in 2015, significantly lower than the US firms, which accounted for a ratio of 4.40% (Huwei Wen and Zhao Zhao,2021)
The Made in China 2025 aims to stimulate innovation, by increasing the R&D investment for the Chinese firms and create a self-reliance system that is essential for a sustainable economic development.

The Chinese government role is crucial to achieve MIC 2025 purposes in the following ways. The People's Republic of China (PRC) is involved in fostering technological advancement as the primary financial contributor, through the government guidance funds (GGF). GGFs are state-backed funds, typically focused on high-tech and emerging industries, such as robotics, computers, telecommunication, semiconductors, and biotechnology. They are designed to provide long-term financing for industries, primarily targeting domestic research and development (R&D) and overseas acquisitions, especially in sectors that are critical to MIC 2025. These funds are necessary for firms targeted in these areas as they usually encounter difficulties in attracting private investment because they are capital-intensive and risky. By early 2020, nearly 1,800 Government Guidance Funds (GGFs) were linked to the Made in China 2025 initiative, aiming for a capital target of $1.5 trillion. At that time, they had already secured $627 billion toward this objective. (Wei et al,2023)[5]

Government aid includes subsidies, where funds are transferred directly from the government to firms to encourage innovation, and indirect subsidies, which reduce operational or financing costs through tax breaks and lower interest rates on loans. (Wübbeke et al., 2016). The substantial capital injections allow firms to save money and invest in projects oriented towards innovation. Another form of funding is government investment in

[5] Analyzed by "The Promise and Pitfalls of government Guidance Funds in China"

firms' equity, effectively making the government a shareholder. This system supports startups and enterprises focused on innovation. Another measure is the Public-Private Partnerships, which consists in the cooperation between the government and private entities to carry out projects**,** such as building new infrastructure and developing cutting-edge technologies[6] .This collaborative approach helps share risks and rewards while incentivizing the innovation process.

There are some noteworthy cases showing that GGFs have simplified the process for high-tech startups to receive funding. One notable example is represented by the National Emerging Industry Venture Capital Guidance Fund (NEIVCGF) that collected an amount of 40-billion-yuan fund. The NEIVCGF invests in smaller funds managed by venture capital firms. These smaller funds then invest in startups in key areas such as new materials, electric vehicles, energy-saving and environmental technologies.

In addition to direct financial support, other powerful policies implemented by the government, although considered anti-competitive by some, serve as incentives for innovation within China. For instance, China's laws and regulations often require foreign companies to form joint ventures with local Chinese firms in exchange for market access in the country. These regulations are enforced through various mechanisms, including industry-specific rules and investment approval processes.

In certain sectors, such as the aerospace and automotive industries, China has stringent regulations that mandate foreign firms to partner with Chinese counterparts. Another way in which foreign technology transfer (FTT) occurs is through Chinese administrative approval processes. To gain or keep access to the market, foreign investors often must share sensitive information about production methods, formulas, designs with government officials. Foreign businesses must go through multiple administrative approval steps at various levels and in different sectors of the Chinese government. This can involve obtaining permission from specific departments and officials to operate within the country. (Jhn-An Lee,2020).

These requirements on foreign firms aim to enhance China's technological capabilities by leveraging foreign expertise and knowledge. Restrictions are imposed on collaboration with foreign companies for the government procurement project, to bolster the competitiveness of domestic firms in critical industries. In addition, by limiting foreign participation, the government aims to foster a more favorable environment for Chinese companies to develop and showcase their capabilities. Chinese firms are strongly incentivized to invest in foreign enterprises and repatriate somehow, the technology at home. (Huweien and Zhao Zhao, 2021).

This strategy is actively supported by state-owned enterprises (SOEs). The presence of SOEs is necessary for the government to maintain control over key sectors and implement its objectives efficiently. While this approach facilitates the rapid acquisition of technological know-how, it has sparked debates about its compatibility with the core objectives of "Made in

[6] See China manufacturing 2025: Putting Industrial policy ahead of Market forces by European Chamber.

China 2025," which prioritize the development of independent innovation capabilities rather than reliance on foreign resources.

Moreover, China promotes numerous talent recruitment programs, with an estimation of more than 200 plans. According to the FBI, China pledged to spend 15% of its GDP, more than $2 trillion, on improving human resources between 2008 and 2020. The most important examples are Thousand Talent programs and Youth Thousand Talents Plan. These programs aim to bring back ethnic Chinese and foreign experts, including top scientists, professors and students working in Western universities, research centers by offering them competitive salaries, research funding, and other benefits to work in China. The goal is to help China become a global leader in technological innovation, because these recruitment programs allow to bring in foreign-trained experts to access knowledge, skills, and technology that are essential for its economic growth. For China, these talent programs are not just about improving scientific collaboration or increasing academic prestige. They are closely linked to national security objectives, including enhancing China's self-sufficiency in key technological areas and reducing its dependence on Western innovations.

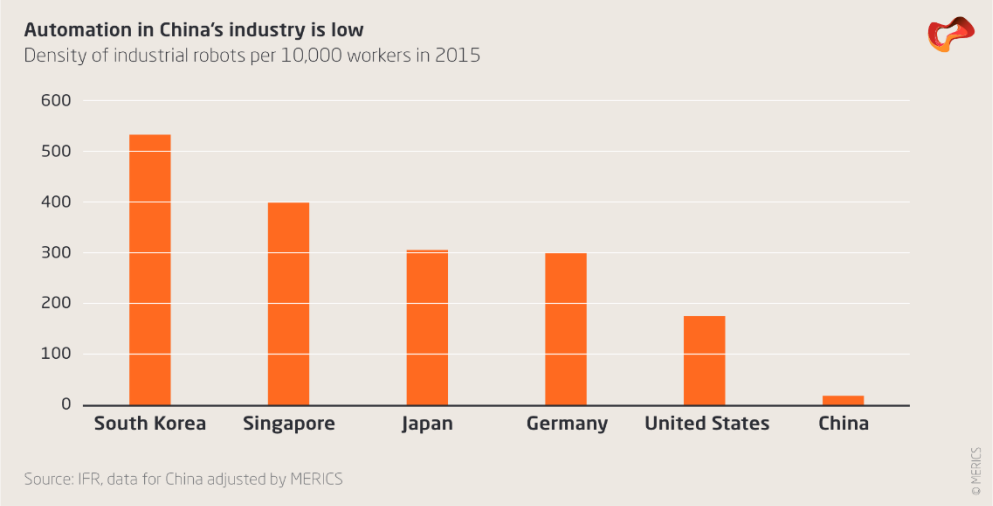
The Chinese Communist Party (CCP) plays a central role in managing the Talent Programs, as ensuring they align with national priorities. As a result, the CCP has established a complex system to coordinate the program, for example, participants in the recruitment program must sign legally binding contracts, giving the Party significant influence over them. In many cases, the contracts contain specific clauses that bind participants to share their research or intellectual property with their Chinese counterparts; some contracts even include non-disclosure agreements, preventing participants from sharing their work outside of China without government approval.

From an international perspective, China's talent recruitment programs have raised concerns in countries especially like the United States, since these initiatives are regarded as s form of intellectual property theft or a way for China to gain access to sensitive technologies that could be used to strengthen its military capabilities. There have been numerous reports of participants in these programs being involved in technology transfer that directly benefits China at the expense of other nations.

China's government policies exemplify the interventionist nature of the Chinese state in shaping the economy and pushing technological advancement. Unlike traditional capitalist economies where private sector firms primarily drive economic activity, China relies heavily on state-owned enterprises (SOEs) and government-backed initiatives to play a central role in industrial development and innovation. "Unlike *any other capitalist political economy that has been deeply involved in Europe or elsewhere in the last 20 years, China is distinct in not having private sector firms as its principal economic actors. This role is taken by state-owned enterprises (SOEs)"* (Handerson and al ,2021, The Wind from the East).

Not surprisingly, Made in China 2025 plan is a clear manifestation of Chinese government active involvement in the economy. The political significance of these projects is evident in the roles played by institutions responsible for setting and implementing technological guidelines. In addition to that, the government presence is demonstrated by the requirement of its components in taking a position in the companies, as it seen that most percentage of the companies have their own Party branches (Grünberg, 2021; Zhang, 2018)

As far as the objectives of MIC 2025 are concerned, smart manufacturing is also one of the key objectives of the Made in China 2025 plan[7], involving the adoption of automation and digital technologies within industrial systems, such as industrial robots and artificial intelligence.
In this section ,Wübbeke et al. state that China currently lags behind Western countries in adopting these cutting-edge tools showing that China's industrial economy still heavily relies on systems and instruments from the second industrial revolution.



From the above table, it is possible to observe that Chinese enterprises are lagging behind advanced countries in implementing industrial automation and particularly emphasizes on improving this aspect, as it affects directly the level of productivity and therefore economic growth in the long run. The authors also give explanations for this disparity. The first reason is traceable in the low labor cost, which is one of the main comparative advantages held by the Chinese economy, employing labor force remains the most convenient and cheap input source for Chinese firms. Nonetheless, in recent years there has been growing tendency among firms to introduce new technologies into their factories and this trend is particularly evident in places where rising labor costs are putting pressure on companies to look for alternative cost-saving measures. Another possible cause for the low level of automation in China is attributed to the strong state involvement in the functioning of economy. The government frequently provides financial assistance to certain industries through favorable policies, such as subsidies and easier access to financing. While these measures are intended

[7]See Wübbeke et al. ,2018, Page 11 section on smart manufacturing.

to support economic development and strategic sectors, they can also reduce the competitiveness of firms relative to those in more market-driven economies.

Besides smart manufacturing, Made in China 2025 also aims to improve product quality. To gain consumer trust, Chinese manufacturers apply attentive quality control measures to ensure the reliability of their products. Important progression must be made also in promoting Chinese brands. This means the need to build distinct brand identities that highlight their unique strengths, including developing branding strategies that emphasize attributes such as technological innovation, sustainability, and affordability.

Green development is also one of the targeted objectives. It aspires to the eco-friendly transformation of the factories, thanks to better usage of resources to reduce emissions and thanks to more sustainable practices across industries. This can be achieved by the development of green manufacturing systems and factories.
There is a strong connection between GDP and environmental degradation (Mahmood and al, 2021, Review on EKC hypothesis on China); in fact, their relationship can be illustrated by the Environmental Kuznets Curve. For over four decades, rapid economic development in China has been accompanied by increased environmental pollution. However, as GDP reaches a certain level, awareness of the importance of environmental sustainability rises, and the traditional Chinese business model, which relies on cheap labor and resource-intensive industries becomes no longer sustainable for firms. Therefore, green development represents a new horizon for economic growth in China, emphasizing efficiency and environmental care.
Recent research has highlighted the significant role of digitalization in promoting green development. In the modern technological era, digital advancements facilitate the upgrading of manufacturing processes, enabling better resource allocation and production efficiency. This, in turn, contributes to reducing pollution emissions and environmental impact. (Ying Lin, Quan-Jing Wang, and Meiqi zheng,2024). Chinese corporations are therefore increasingly leveraging digital technologies such as big data analytics, and artificial intelligence to optimize operations and achieve sustainable growth. Furthermore, promoting green development aligns with global trends of low-carbon and sustainable practices. By adhering to strict emission targets and environmental regulations, Chinese corporations not only enhance their environmental credentials but also improve economic competitiveness, by putting themselves in the position of leaders in sustainable development and gaining comparative advantage in the international markets. Investments in advanced and intelligent innovations enable companies to meet these regulatory requirements, while achieving operational efficiency and cost-saving measures, consequently creating a growing incentive for Chinese firms to adopt the new technologies.

3. STRENGTH AND PITFALLS FOR THE SUCCESS OF MIC

China has a strong network of policies to promote technological progress and at the same time must cope with some weaknesses that might impede the country from becoming one of the manufacturing powerhouse leaders in the world. Wübbeke et al. [8] Shed light on a detailed analysis of the advantages and the drawbacks of MIC 2025.

Regarding the positive aspects, a fundamental strength comes from the top-down nature of the policy. This approach can cause widespread discussion after its announcement; not only did the initiative soon become a central topic in the country's discourse on technological advancement and industrial modernization, but it has become strongly debated also in academic and professional circles. This surge in research and discussion facilitated the development and diffusion of new ideas and discoveries within the industry. The strong impact of the initiative can also catalyze the process of the entire country to align with the same interests, by festering the achievement of technological advancement.
The top-down approach allows to create a stable and long-term plan since Chinese leaders are less influenced by public opinion compared to democratic leaders. In this way, by paying less attention to short-term fluctuations and by considering the importance of time for the effective results, the Chinese government can focus on the long-term objective with methodical programming and still guaranteeing the implementation of the targets defined by the policies.

The experimental-oriented methodology is also a significant advantage for the implementation of MIC 2025. Specifically, the government verifies the validity of the new approaches through trial projects, which becomes a testing for other projects to be applied in the whole country. In 2015 MIIT, the Ministry of Industry and Information Technology, launched numerous projects for industrial upgrade. The demonstration projects focus on several key areas to improve the production capabilities of the industries.

[8] in the Chapter 3 on the strengths and limitation of Made in China 2025

Source of funding	Total estimates	Description
Advanced Manufacturing Fund	$ 3 billion	Promote upgrading of labor-intensive, low productivity, manufacturing facilities in modern, machine-intensive ones. Covers all industries in MIC 2025.
State Development and Investment Corporation	$ 6 billion	Financing to robot- and AI-related manufacturing operations
Several Opinions on Finance to Support Industry Stable Growth, Restructuring, and Improving Profit	unclear	Encourages banks to provide financial support to develop indigenous brands and increase export credit insurance for indigenous IP and strategic and emerging industries
Industrial transformation and upgrading fund	unclear	Sets to increase industrial products quality and strengthen indigenous innovation, and indigenous brands
National Emerging Industries Investment Guiding Fund	$ 6 billion	Aims to support strategic and emerging industries and high-technology industries
Major technology equipment insurance compensation system	unclear	Loans to support the use and promotion of robotics
IC Investment Fund	$ 150 billion	Uses fund to finance investment M&A for companies and technologies in the semiconductor industry
MIC 2025 Strategic Cooperation Agreement (between China Development Bank and MIIT)	$ 44.8 billion	Provides financial support to implementing the MIC 2025 plan
The Special Constructive Funds	$ 270 billion	Provides financial support to a number of policy initiatives, including MIC 2025 and Internet Plus
Shaanxi MIC 2025 Fund	$117 billion	Provides financial support around 100 projects in 14 areas
Gansu MIC 2025 Fund	$37 billion	Provides financial support to over 600 major projects
Anhui Manufacturing Development Fund	$ 4.36 billion	Promotes Anhui's transformation from a big manufacturing to a strong one
Sichuan MIC2025 and Innovation-Driven Project Guiding Fund	unclear	Funding for R&D in ten development areas in the Sichuan MIC 2025 Action Plan
National Integrated Circuit Fund	$31 billion	M&A financing for acquisitions in the semiconductor industry
Emerging Industries Investment Fund	$2.28 billion	Loans to support high-tech industry product development
Special Constructive Fund	$270 billion	Funding for numerous MIC 2025-related projects
Nanjing Economics and Technological Development Zone	$ 1.3 billion	Create a "National Artificial Intelligence Industry Base"
Beijing Technology Innovation Fund	$3.17 billion	Funding for optoelectronics technology, big data, new materials, clean energy, AI, advanced manufacturing, health care, information technology, quantum computing

Additional advantages of MIC 2025 consist of the large amount of funds and financial support disposable for investing in the 10 prioritized industries.

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From this table it is possible to see not only the generous amount of capital injections from the State, but also the detailed structure of the investment project; for every specific sector and goal targeted corresponds to the amount of funds collected. This explains why MIC 2025 has been so significant, even though technological plans already existed before MIC 2025, they were not comparable with this current initiative for its well-structured implementation

[9] Source: Wübbeke et al. (2016)

and for its magnitude. From the table it is possible to see that Advanced Manufacturing accounts for about 3 billion euros and what strike the most is that it overcomes substantially the investment level provided by the German government of 200 million euros for research and innovation.

A fundamental role in fostering the transition to smart manufacturing is played also by the local governments, which responded with enthusiasm to MIC 2025. Their enthusiasm is justified by the economic prospects from participating in the project, for example, the local government, by creating favorable conditions for smart manufacturing can attract domestic and foreign investment in high-tech industries, which contributes to regional economic growth. The strong economic incentives pushed the local government to invest in the targeted industries, especially in robotics. Apart from the economic benefits, the high competition between the local cadres has caused aggressive collection of funds that often outweighs the number targeted by the government. A particular characteristic is that numerous cities launched their local Made in China 2025, with specific local priorities aside from the general framework. We can therefore state that while the central government gives the general push for the innovation process by defining the priority industries, however, it is the local government that has the decisive role in determining the direction and the speed of smart manufacturing growth.

However, the intense push from the local government is a double-edged sword. The most problematic issue resides in their uncoordinated local investment, which can create the risk of overinvestment and low-value production, as manufacturers might focus on producing cheaper, lower-quality products to meet the increased demand quickly. Once the subsidized goods outpace demand, their price decreases. The negative consequence of overinvestment is that, because of a reduction in production cost and increased productivity thanks the financial support, firms might fall into the trap of mass production of tech goods, rather than concentrate on developing innovative goods.

It is also estimated that Chinese government intervention might contribute to the creation of Zombie firms, recommending a more market-driven economy to take the lead. (Chang et al, 2020). The paper suggests that government policies such as subsidies, financial aid, and favorable tax regulations are instrumental in keeping these unproductive firms alive, inducing inefficient resource allocation. It might happen that the enterprises' specific conditions and circumstances suitable for realizing smart manufacturing are disregarded. The government applies the goals to enterprises that are not ready to use advanced technologies; actually, some firms are still in a backward position in the development process. It might happen that focusing too much on advanced technology and looking over the specific needs of the enterprises can produce even negative results.

The transfer of enormous amounts of funds also might lead to inefficient allocation of resources, due to rent-seeking activities; firms with closest influence in the political system are more likely to receive government funding, consequently the enterprises that show more demanding need and higher qualifications for external help lose the possibility to improve.

Concerning the technical expertise aspect, the success of technological upgrade must rely on a wide range of knowledge: the usage of automated machines requires advanced skills in electrical engineering, and the implementation of advanced IT systems for data collection and analysis necessitates expertise in software engineering and data science. Therefore, one of the biggest barriers to the transition to the innovation economy in China is the shortage of skilled workers. Chinese universities struggle to teach the required skills to their graduates, because the rapid pace of the technological change overcomes the one of curriculum updates. To aggravate the situation, there is a lack of specialized training programs that guide the workers in acquiring the knowledge for complex IT-based processes. The lack of skilled workers has several negative repercussions on industrial upgrading, for example, firms must increase operational costs to be used in training programs, diverging the resources from critical areas, moreover, the insufficient number of skilled workers slows down the process of upgrading, impeding the Chinese economy to gain economic competitiveness.

4. THE NEVs MARKET

In recent years, China has achieved outstanding progresses in the New Energy Vehicle (NEV). According to official data[10]in 2017 China became the global leader accounting for 40% of world NEV production, while in 2010 just some years previously the production in China arrived only at 11%.

The rapid growth of Chinese NEVs is driven by the strong attention given to it by the central government, as it constitutes one of the ten high-tech targeted manufacturing sectors selected and is one of the prioritized industries of the Made in China 2025. These goals are pursued by creating a domestic network of NEVs with high comparative advantages. Specifically, the Chinese industry promotes the development of a dominant NEV market by focusing on the reduction of carbon emissions, replacing traditional fuel with electrification, and introducing digitization and autonomous driving. By doing so, improvement of environmental quality and diminished dependence on oil imports are both achieved. (MIIT 2015)

Godfrey Yeung [11] has conducted research on Chinese NEV, illustrating the importance of government's role in guaranteeing cost advantages and sectoral upgrade when competing in

[10] collected by International Energy Agiency
[11] on 'Made in China 2025': the development of a new energy vehicle industry in China, Area Development and Policy'

global markets. One of the policies implemented regards financial incentives given by the government to help automakers reduce substantial costs in developing new engine system for NEVs. On the demand side, consumers are incentivized to purchase new energy vehicles thanks to a competitive price strategy under the subsidy policy. Thanks to the new policy, some car models are selling at low prices, for example BAIC's EC180, a BEV, is selling for around a third of the original price after subsidies and discounts. The cheap price of EC180 is the reason why it became one of the most demanded models in the world within a year. Other advantages for consumers are provided by the green plate policy, which offers various benefits to NEV owners, such as parking privileges, exemption from restrictions applied to conventional cars in major cities and less bureaucratic registration compared to traditional combustion engine vehicles.

Apart from the financial support that pushes the supply of NEVs ,Yeoung has stressed the importance of regulamentary parameters change, transitioning from CAFC to fuel efficiency with NEVs quota-based credit scores. CAFC stands for Corporate Average Fuel Consumption and is a regulation that controls the emission of carbon dioxide released by combustion engines produced or imported by a manufacturer within a specific period by respecting a predefined set of criteria like those imposed in Europe.

The purpose of these new measures is to foster domestic NEVs production and sales, and to reduce the technological difference between China and foreign countries. For example, the new rating method forces the incumbent leading firms in the automotive industry to collaborate with Chinese firms by creating Joint Ventures. This alignment with the NEV policy prerequisites allows them to continue selling combustion engine system vehicles in the Chinese market. The VW group illustrates an example of this: in order to sustain its credit rating VW must sell 83,400 BEVs in China, and VW must obey these new measure as China constitutes its most important market. The strategy is to facilitates the transfer of technologies and expertise in the production of NEVs, thus enforcing the advancement of Chinese automotive industry.

On one hand the global automakers are forced to establish new joint ventures with Chinese enterprises specializing in NEVs, their action is also undoubtedly driven by the benefits gained from the supply chain and government support, that are necessary for scaling up NEV production faster and more efficiently. In addition, the relaxation of restrictions on Sino-foreign joint ventures has contributed to the foreign automakers' rush into China.

Another important reform boosting NEV production is related to infrastructure innovation, which is crucial for BEVs as one of their main problems concerns the distribution of charging

poles. Compared with combustion vehicles, recharging BEVs is a much more difficult procedure. The central government provides subsidies for electricity companies to build charging networks and innovation in battery energy density. Thanks to government investment, the charging poles network has expanded significantly in China over the last few years. In 2016, 100,000 charging poles were installed, reaching 446,000 poles by the end of 2017.[12]

However, in recent years many critical drawbacks have been found in the NEV industry, especially regarding the battery production sector. One limitation is due to the highly fragmented market for electric battery vehicles, meaning many small firms and only a few dominant leaders; The reality is that a handful of BEV manufacturers and major battery producers dominate the market. Another barrier comes from the already consolidated position of global firms in the electric vehicle batteries production, particularly in Japan and South Korea. Most of the major participants in the battery supply chain are found out to be Japanese. The combination of a highly fragmented market and intense competition against international frontrunners in the battery network remains a challenge for the domestic economy.

However, China has made striking progress in the NEV industry. In 2023, China's electric vehicle market surpassed traditional fuel vehicles, becoming the leading market in sales, with car exports surpassing Japan to become the world's largest, shipping over 4 million cars, including 1.2 million EVs, with exports to Europe and Asia Pacific rising notably by 65% and 80%, respectively.[13] China's NEV market is poised for continued growth and innovation, supported by strong government policies, financial incentives, technological advancements, and an expanding infrastructure network. As the country aims to lead the global NEV industry, its strategies and developments will likely shape the future of sustainable transportation worldwide.

5. TELECOMMUNICATION AND MOBILE MARKET

In recent years, China has emerged as a leader in the global race for 5G development. This focus is due to the Chinese government's recognition of 5G's crucial role in industrial upgrading and the digital economy. Unlike the 1G and 2G eras where China lagged, and the

[12] CAAM,2017

[13] These numbers are collected by World Energy outlook,2018

3G and 4G eras where it caught up, 5G presents an opportunity for China to lead in wireless technology development.

The four major state-owned mobile network operators (MNOs)— China Telecom, China Unicom, China Mobile, and China Broadnet—have solidified their influence in the domestic market and are actively advancing 5G. These MNOs follow government policies, which are key drivers for the booming 5G industry, including subsidies for building and renting 5G base stations and regulating competition among them. For instance, the government strategically manages spectrum allocation to favor smaller players like China Broadnet, promoting balanced competition. (Yu-Li-Liu and al.,2024)
Additionally, the government encourages cooperation among the four MNOs. In 2020, it issued a regulation promoting shared infrastructure to avoid duplication and ensure resource efficiency. This regulation prohibits exclusive use of base stations and includes performance appraisals to monitor compliance, affecting their evaluations and funding. (Yu-Li-Liu and al.,2024)
Government support extends to providing essential technological resources and promoting patent filings to enhance competitive advantage. Patents are critical indicators of technological leadership, protecting innovation and allowing companies to offer unique services.

In conclusion, China has become a global 5G leader, essential for its industrial upgrading and digital economy. The government's significant role includes providing subsidies and shaping competition among state-owned MNOs. Strategic spectrum allocation fosters competition and innovation, while support for patent filings encourages technological leadership. Despite the limited demand for 5G and innovation in applications in 2023, the strong policy-driven approach has effectively advanced 5G progress, positioning China to be a frontrunner in the 5G era and to set the stage for 6G development.

SECOND CHAPTER: PATTERN OF TRADE AND INTERNATIONAL RELATIONS IN CHINA

1. REASONS TO SUPPORT AND GO AGAINST MIC 2025

The international community is divided for its different responses to MIC 2025, reflecting a mix of considerations on the economic opportunities gained through cooperation and on the rising concerns due to the technological advancement and economic dominance of China. While many developing countries see a potential benefit, developed nations with strong technological sectors and strategic security concerns tend to be more cautious or even stand in strong opposition.

The United States has been the biggest opponent of MIC 2025 for its potential threat to technological and economic leadership. It has implemented strict measures to reduce the impact of the Chinese initiative, by imposing tariffs, monitoring Chinese investment in domestic sectors, and applying restrictions on export. Other technologically advanced nations, such as Japan and South Korea also expressed their concerns, the former criticizing China for practicing unfair trade and posing risks to its national security, while the latter although economically linked to China remains wary, particularly about intellectual property protection and fair market access; it carefully balances its economic interests with strategic security concerns.

The EU is characterized by its mixed position on MIC 2025: countries like Germany support the technological improvements promoted by China, seeing it as an opportunity for market access and business opportunities. Despite collaboration with China, Germany reserves some concerns about unfair trade caused by the initiative. Overall, the EU has maintained a cautious attitude and has implemented policies to guarantee free competition.

On the contrary, developing countries in North Africa and South-East Asia have welcomed Chinese investment in technology viewing MIC 2025 as a chance to drive industrial upgrade and hence foster economic development.

This chapter will analyze the international community's reactions to MIC 2025. By delving into the varying trade patterns between the various countries with China and their implications on the different economic and political relationships, we can better understand the spectrum of responses to MIC 2025. Specifically, we will examine the U.S., Europe, Japan, trade dynamics with China and perspectives on the Chinese technological achievements in the context of MIC 2025.

2. U.S. TRADE RELATIONS WITH CHINA AND ITS RESPONSE

To analyze the USA's concerns related to the gradual technological expansion under Chinese initiative MIC 2025, it is necessary to define the framework inside which the economic integration between China and the USA takes place. Firstly, we take a step back and describe the general economic pattern of international trade that has prevailed in the past between China and the USA to find out that the main root for the US's worries derives from the possible outcome of China disrupting the prevailing form of international division of labor and international relations of production; this form of disruption can be explained by the Marxist ideology. (Chen Ziye and Li Bin,2023)

Over the past forty years, the pattern of international trade has profoundly changed with the appearance of a new dominant form of international division of labor, characterized by the development of the GVCs. The GVCs allow various stages of production to be located across different countries, optimizing cost efficiencies, and leveraging specific regional strengths. Nowadays GVC participation is becoming a mainstream form of the international division of labor, as demonstrated by the percentage participation shares of various countries: the GVC participation of advanced, developing countries exceeded 50% in 2017 and the least developed countries had a GVC participation rate more than 40%. [14]

The modern pattern of international trade has, however, created a dependent relationship[15] between the economic partners, where a technological-market dependence exists between the developed and developing countries (Chen Ziye and Li Bin,2023). The authors observe a new type of trade dependence where typically the former detains core technology and market access that allows them to operate in the high value-added link of GVCS, while the latter is dependent on the former's resources and operates in the low segment of the GVCs. A clear example is represented by Apple, which is positioned at the pyramid of supply chains, especially in sectors targeted by MIC 2025, and appropriates a significant share of profits from outsourcing the final assembly in China.

The USA's concerns regarding the Made in China 2025 initiative stem from its objectives of reducing this dependence and promoting self-reliance. Made in China 2025 represents China's realization that its dependency goes against its future development goals. By overcoming this limitation, China aims to climb up the ladder of GVCs and build a modern and strong nation. This shift poses a challenge to the existing economic scenarios, particularly to the USA's position in global supply chains, as it may have negative

[14] See UNCTAD,World Investment Report
[15] Elaborated from the dependency theory in economy

repercussions on The USA's economy. With the Chinese new technological path, characterized by immense R&D funding and new cutting-edge innovations, U.S. companies might lose market share over time. Additionally, Chinese companies start to become more attractive for its investment opportunities thanks to the gradual market expansion of new sectors and this trend would negatively reduce investment inflows into the U.S., impacting its job creation, particularly in high-tech and manufacturing sectors.

The trade imbalance between the USA and China exacerbates these concerns. The large U.S. trade deficit with China highlights the deep economic interdependence, where the U.S. imports significantly more from China than it exports: *"The US deficit with China for 2019, which China reported at US$ 308 billion6 even during the height of the trade war — accounts for an astounding 29 percent of China's total trade surplus with the world."*(Sean Kenji Starrs and Germann ,2021) The trade deficit reflects the underlying economic relationship where the U.S. relies heavily on Chinese manufacturing, especially for high-tech sectors such as electrical machines and electronics and for consumer goods. If Chinese policy is imprinted to a more dependent development, the trade deficit might aggravate for the USA and the high level of reliance on Chinese imports increases the risk of supply chain disruptions, particularly in time of political tensions.

The trade imbalance is also a reason for the rising concern of U.S. national security. The trade disparity indicates also that there is dependence on Chinese high-tech sector imports, which are critical for the U.S. Additionally, the trade deficit is also showing the offshoring tendency of the U.S. manufacturing jobs in China. Many U.S. industries have become dependent on cheaper Chinese manufacturing to gain higher profits, leading to a decline in the demand for domestic production and manufacturing jobs. However, although the labor force in many U.S. industries was negatively impacted by the offshoring and import competition, during the 1990s and 2000s, China's rapid economic growth did not initially alarm the governing coalitions, until the populist rage found a political representation in the figure of Trump. (Starrs and Germann,2021). Concerning the question of labor, Starrs and Germann also identify the labor social interest as one of the main justifications for the US's aggressive response, stating that in The U.S. labor held little power in protecting their interest as they were too weak in preventing the entire production line to offshore in China. This caused a more noticeable wave of job loss in the USA in the manufacturing sector, for example, compared to Germany, where labor was stronger in safeguarding its interest and keeping the manufacturing sector at home and it could be less impacted by the Chinese expansion.

Furthermore, China's economic growth started to emerge as a threat to the U.S., which inherently regards China as a geopolitical rival. The Trump administration capitalized on support from both the labor sector and national security advocates to adopt a more alarming and protectionist-oriented policy (Starrs, Germann,2021).
In July 2018, the trade war between the United States and China officially burst with Donald Trump's implementation of the first set of tariffs on Chinese goods, with a total value of $34

billion; in retaliation, China responded by imposing an equivalent value of tariffs. [16]The tension between the two countries escalated together with the increasing tariff amount; only few months later, the duties applied on billion of Chinese imports harshely skyrocketed, and once again China responded with higher tariffs as well. [17] Finally, in 2020 the two countries declared a trade war truce by signing "the Phase One Trade Agreement", with China committing to purchase more imported goods from the USA and The US agreeing to reduce the tariff rate.

Zhang et al in the paper[18] state that the trade war, rather than aiming at solving the problem of trade imbalance, was a strategy implemented by the U.S. to stop Chinese industrial policy to foster the technological advancement, and itself has relied on these to achieve technological dominance. However, The U.S. has criticized China for its overuse of industrial policy, and it has used the same measures in the past to control the pace of technological innovation with other countries as well. The author also gives ab explanation on the extensive use of industrial policy by China, affirming that China uses more IP than the US because China focuses more on imitating innovations, which are easier to protect with IP, while the US focuses on original innovations, which are riskier and rely more on entrepreneurship. As China rises as a global power, it competes more with the US, leading both countries to use more IP to protect their interests.

Another aspect of the U.S. response consisted of stricter control over the inward foreign investment from China. One of the most relevant actions is the expansion of authority given to the Committee on Foreign Investment in the United States (CFIUS), the entity which deals with reviewing foreign investments concerning National Security. The Foreign Investment Risk Review Modernization Act (FIRRMA) passed in 2018 expanded CFIUS's jurisdiction on any minority investments and real estate transactions near sensitive government facilities, while before this act CFIUS could block only investments that led to control of firms only in certain sectors that potentially threat National Security. (Starrs, Germann,2021).

A consequence of this tighter screening is that Chinese investment significantly dropped to less than 100 bln$, compared to 2016 of 200 bln$.[19] China responded as well with tighter capital control to prevent capital outflow overseas. Kirkegaard in article [20]shows the tendency of declining investment in the USA by China, by pointing out an interesting fact that the decline of investment conducted by China is due to the active decision of China to reduce outward investment, rather than directly because of stricter measures imposed by the USA. Biden administration also highlighted the necessity of scrutinizing Chinese investment but

[16] See Trade War begins: US and China exchange $34 billion in tariffs https://www.cnbc.com/2018/07/06/trade-war-worries-us-china-tariffs-to-kick-in-on-friday.html

[17] See "The US-China trade war: dominance of trade or technology?"
[18] See "Industrial Policy and Technology Innovation under the US Trade War against China.",2020
[19][19] See "Chinese investment in the US and the EU is declining."

[20] See "Chinese Investment in the US and the EU is Declining –for Similar Reasons"

focused also on the importance of collaboration with allies in achieving the goal. The international cooperation in monitoring Chinese investment in the critical sector is exemplified by the Nexperia-Newport Wafer Fab Case: In 2022, the U.S. worked with the UK government to review the acquisition by Chinese-owned Nexperia of Newport Wafer Fab, a major semiconductor plant in the UK. The acquisition raised concerns due to the strategic importance of semiconductor technology, from military equipment to consumer electronics, and fears of the potential technology transfer to China. Eventually, because of concerns about national security risks, the UK ordered Nexperia to sell at least 86% of its stake in Newport Wafer Fab. [21]

Another crucial policy is the Export Control Reform Act in August, which took significant action against major Chinese tech companies, initially by banning American businesses from dealing with them. For example, In April 2018 the U.S. Department of Commerce prohibited American companies from doing business with ZTE, which is China's second-largest telecom company. Facing a potential collapse, ZTE reached a deal in June 2018, this move exposed how the Chinese economy is dependent on foreign technology. The ban was suspended for 10 years, however, by imposing strict conditions: it was required to replace ZTE's entire board of directors and senior management. (Starrs and Germann 2021)
Afterward, the U.S. imposed an even stricter ban on Huawei, one of China's leading tech companies. One of the reasons for the particular attention on this company, apart from operating in the telecommunication sector and being critical for national security, is due to its pivotal role in leading in the 5G technology, which is becoming a threat to the USA position in the technological landscape. In January 2019, the U.S. Department of Justice indicted Huawei and its CFO for financial fraud and theft of trade secrets. Later restrictions on Huawei deteriorated with its requirement that any transfer of U.S. technology to Huawei first receive a Commerce Department license, which is unlikely to be granted due to national security concerns. (Kierkegaard,2020)

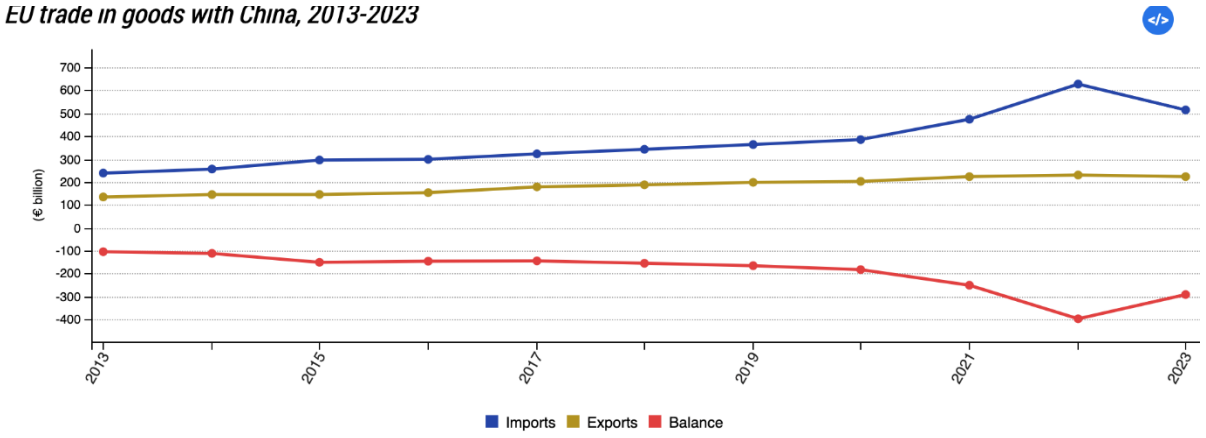
Despite these stringent measures, there was a temporary easing of restrictions, with the Trump administration announcing that some American firms could temporarily sell inputs to Huawei. Moreover, The U.S. also worked to persuade its allies, especially in Europe to ban Huawei, aiming to halt its global expansion. Under the Biden administration, the trade war between the two countries has persisted, under a mix of continuity and different approach. On one hand, Biden has continued applying the tariff measures initiated by Trump, while engaging in new strategic shift. In contrast with the direct and import targeted approach under the Trump administration, Biden has tried to deal with the Chinese trade issue by coordinating with other partners, such as the European Union and Japan to create a united front that can counter the Chinese global influence. Moreover, under Biden, it is emphasized the importance of creating a resilient supply chain[22], such that the United States becomes less dependent on Chinese imports.

[21] See "Newport Wafer Fab: Semiconductor plant takeover gets go-ahead" https://www.bbc.com/news/uk-wales-68449303
[22] for example with the the Chips and Science legislation

3. EU'S RESPONSE

The MIC 2025 initiative has partly been responsible for the EU's paradigmatic shift towards the rise of China. Initially, in the first half of the century, the EU viewed China's openness to the international markets with good eyes: the dominant perception across the EU's members was that engagement with China would bring economic benefits and that the alarming feeling of China as a possible threat to national security was invalid. (Wright 2020). In 2014 Germany took the first move in framing collaboration with China, by considering it a strategic partner; the UK, following the German steps, was next in expecting to create new trade relations with China and overall, this positive approach shaped the EU's behaviors. Nevertheless, over time EU started to grow more skeptical about China's intentions and actions, and the main cause of this change is due to economic factors. (Wright 2020) The EU started to realize that China's economic reforms would not allow them anymore to grant larger market access, but it started to see clearly that China was trying to achieve goals that might threaten Europe's future economy through a powerful state-backed policy, allowing it to catch up key technological sectors with the Western and to become independent from foreign technology ,and pushing itself at the same time as the future biggest manufacturing country in the world. These goals are the effective targets of MIC 2025, the reason why the EU has started becoming cautious about its interaction and dependence on China.

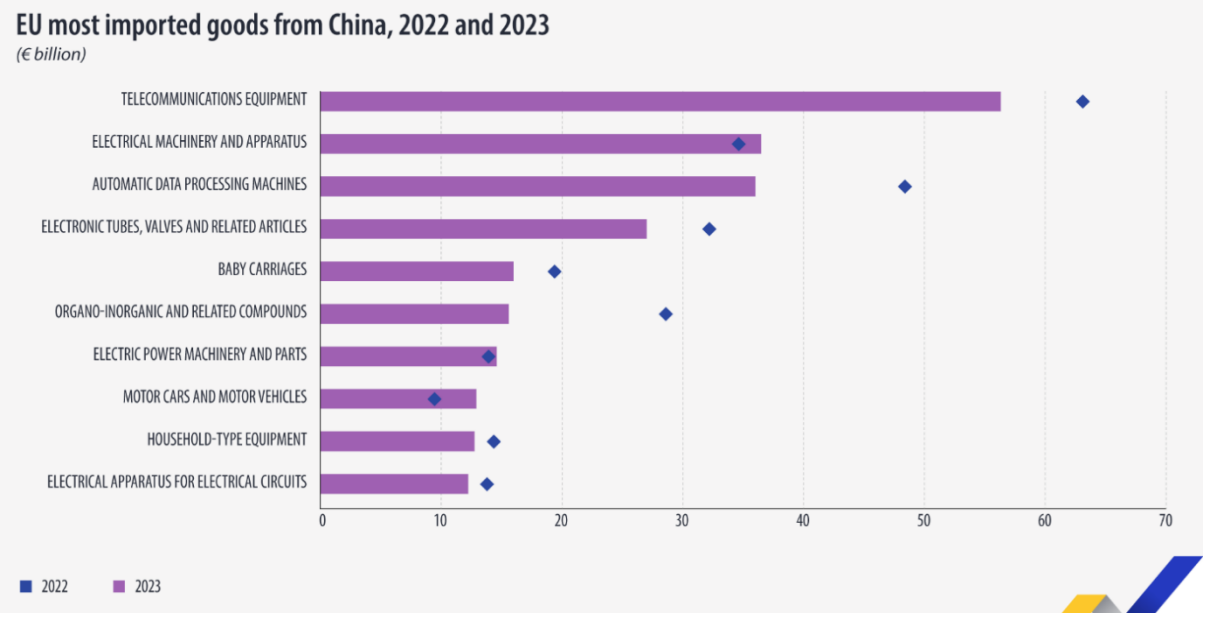
To understand more the paradigmatic shift of Europe towards China we first need to have an insight into the trade patterns between the two parties.



23. The picture above depicts the trade relationship between Europe and China from 2013 to 2023, showing the EU's notable level of trade deficit concerning China in the span time of ten years. Nearly all the EU member states face trade

[23] source: E*urostat (online data code: ext_st_eu27_2020sitc)*

deficit with China, with only a few exceptions where countries have a trade surplus, such as Germany and Finland.



[24] Another striking element captured in the trade deficit between the EU and China shown by the above table is that the former mostly imports from China high-tech goods that belong to strategic sectors like telecommunications, electrical machinery, and data processing equipment. These are the sectors targeted by Made in China 2025 and it explains the shift in Europe's attitude towards China's orientation to a technological-intensive development. The large trade deficit means that Europe is providing significant financial resources to China, which can be used to further the goals of MIC 2025, through investments and subsidies for the enterprises, and while Chinese industries are upgraded to the next level, Europe's competitiveness in the same sectors is undermined. Furthermore, the trade deficit raises member states concerns that their economic dependency on Chinese imports and neglect of the domestic manufacturing sectors development can cause a reduction in employment and industrial capacity, impacting not only the current job level but also the future development of industries that are vital to Europe. The Chinese goal of reducing dependency on foreign technology and the rising reliance of Europe on Chinese imports, both contribute to the deterioration of the trade imbalance between the two parties. Europe's emergency to act against Chinese expansion starts to be evident, realizing that it is necessary to adopt a new approach driven by a unified stance in the EU. *"Member States realized more and more clearly that none of them alone can tackle the challenges of unbalanced trade and investment relations with China"* (Wang, 2022, p. 9).

The first action taken by The EU is therefore a more coordinated and collaborative approach, rather than each country pursuing its own policies. By negotiating together as a group, they represent a much larger market and have larger economic power, which gives them more

[24] Source dataset Eurostat: DS-018995

leverage in trade discussions that allow them to fix trade issues. The trade deal would be, in fact less efficient if it were a single state to negotiate with China. The EU might collect resources to invest in strategic sectors to maintain global leadership, such as advanced manufacturing or digital technology. This can counterbalance China's investment in similar areas targeted by Made in China 2025 and avoid internal competition and fragmentation that could weaken Europe's overall position. Moreover, The EU can implement common policies, such as anti-dumping measures and screening foreign investment to protect European industries from unfair competition.

As can be seen from the interviews collected by officials of EU institutions by Earl Wang[25] there is clear evidence of the shift of the EU member states to a more collaborative attitude. For example, He noticed that Commission officials have capture growing agreement on how to handle China within the EU, especially it observes a political collaboration with regular consultations between various departments when dealing with the case of China. There has been progress in coordination and cooperation between Brussels and the capitals of EU member countries, and even in areas where the EU has full control over policy, implementation still requires working with Member States.

A striking fact is that Germany also took part in the new approach against China and the reason is that Among the European Union, Germany is the most important partner of China, especially for its strong export sector in the sectors targeted by MIC 2025, accounting the largest surplus in vehicles with value $ 19.9 billion. Moreover, in 2019 Germany recorded a surplus with China of US$ 23 billion and has accounted for about half of all exports of manufactured goods from the EU to China. (Starrs e Germann, 2021) The reliance on German exports is a clear sign that the integration with China is beneficial for the German economy. However, despite the economic opportunities gained from this collaboration, Germany, recognizing the strategic and competitive challenges posed by China, has joined calls for a more united and cautious EU approach.

According to the findings[26] by Earl Wang, the most significant document revealing the cooperative nature of Europe towards China's rising influence is the EU-China-A Strategic Outlook, which was published through a shared declaration by the European Commission in 2019. It stands out as the first document that officially formulated a new approach of Europe in managing the relationship with China. Previously, EU documents like trade agreements or policy papers primarily treated China as a trading partner, focusing on tariff reduction, and market access improvement. For instance, a 2013 EU communication emphasized collaboration on economic growth and sustainability, viewing China as a partner in these areas. Even in areas where Europe diverged from China's behaviors, namely questions concerning human rights, Europe had issued policies urging China to pay attention and improve this aspect, and human rights were treated separately from trade-economic aspects. However, the new document reflects a more integrated and complex relationship between the two players, where Europe starts to recognize China not only as a partner but also as a

[25] See" Eu's paradigmatic shift towards the rise of China"
[26] See" EU'S Paradigm Shift towards the Rise of China.",2022

competitor and rival in every sense, both economically and politically speaking. Therefore, the new strategy includes a variety of issues covering multiple dimensions for which the member States are all aligned with the same objective of maintaining Europe's identity in the light of China's rising competitiveness and global influence.

The document emphasizes the necessity of strengthening the European Union's trade defense instruments as a critical response to the challenges posed by Made in China 2025 and strongly criticizes the unfair methods employed to achieve industrial upgrade and technological independence. China has been accused of dumping products into the European market thanks to its strong state-backed- policy, such as granting subsidies to Chinese enterprises. The financial support received by the central government allows firms to operate with more advantages and therefore set lower prices, which might undercut local producers, making it difficult for them to compete and threaten the local industries. Moreover, China has been criticized for its practice of mandating technology transfers from European companies. This requirement facilitates China's acquisition of crucial technology needed for its development, but at the same time, the practice is detrimental to European technology innovation and intellectual property rights.

According to the results from[27],one of the trade defense measures consists of an anti-subsidy measure. In the last decades, the EU has increased its investigations into unfair subsidies, with China becoming the focus, as a noteworthy share of these cases involve Chinese subsidies. This is a substantial change from earlier years when countries like India, Indonesia, and the US were more commonly targeted. In 2020, most of the EU's anti-subsidy actions were taken against China and in 2020 the EU completed two important investigations that led to countervailing duties on subsidies connected to overseas zones with which China has collaborated. These cases involved Chinese-owned companies in Egypt producing glass fiber products and exporting them to the EU. The investigations revealed the trend of Chinese state-owned companies shifting production abroad with government support: Chinese companies in Egypt's special zones were receiving subsidies from both Chinese and Egyptian governments, allowing them to sell their products in the EU at unfairly low prices. This harmed European industries.

As concerns grew not only about China's economic impact on the EU but also about the potential threat to national security posed by China's increasing influence and technological advancements, Europe soon realized that economic measures alone were no longer enough to sustain its technological dominance. One of the main worries derives from the practice of forced technology transfers; according to the most recent surveys conducted by the European Chamber of Commerce, it is revealed that about 20 percent of a total of 585 European firms were obliged to transfer technology to Chinese enterprises.[28] Europe starts to be more alert, especially with the successful acquisition of the German robotics company KUKA AG by the

[27] 39th Annual Report from the Commission to the European Parliament and the Council on the EU's Anti-Dumping, Anti-Subsidy and Safeguard activities and the Use of Trade Defence Instruments by Third Countries targeting the EU in 2020

[28] Emphasized in "Perceptions of China's Outward Foreign Direct Investment in European Critical Infrastructure and Strategic Industries," International Politics,2017

Chinese company Midea in May 2016, (Wang, 2022, p. 12). Rabe and Gippner have shown some interesting insights in their paper. From the economic perspective, the deal was seen positively by German industries because China was a growing market for robots, and KUKA saw the acquisition as an opportunity to expand in China. However, there were concerns from German car manufacturers about Chinese competitors gaining access to sensitive technology used in car production, as well as worries about limited market access in China and protecting intellectual property. The European Commission also expressed its major concerns since the acquisition concerns the strategic sectors of Germany, specifically underlining that the acquisition would be blocked for European firms in China due to market barriers and suggested other solutions, such as keeping KUKA under European control; unfortunately, no major European companies were interested in taking over the company and since KUKA didn't fall under Germany's strict investment restrictions, the acquisition was completed successfully by the Chinese company. The broader presence of China in Germany, especially in crucial sectors surely has created a broader debate on the need for stricter regulations to protect strategic sectors from foreign takeovers in the future.

To fix these concerns and to safeguard European industries from foreign takeovers, the EU increased monitoring of foreign direct investment through Regulation 2019/452 with the estimation of an increasing number of investigations. The EU policy monitors Chinese investments when national security and public order are concerned, such as in critical infrastructure, both physical or virtual, such as energy, communication, and health sectors, critical technologies, supply of important inputs and access to private information. (EU,2019)

This new screening framework is particularly effective in improving how information is shared between the Commission and EU Member States: when a transaction is being reviewed, the Commission and other countries can ask for more details, helping to spot and manage risky investments. Even though it is the single nation to have the final say, they must consider feedback from other Member States and the Commission. A notable case involved Italy blocking the sale of a tech company to a Chinese firm, reflecting growing concerns about protecting critical technologies from foreign takeovers. The EU is also looking to work more closely with other countries, like the United States on investment screening, especially in managing relations with China. The new Trade and Technology Council between the EU and the US shows a commitment to sharing information and coordinating policies. Despite the tightening of control on Chinese investments, challenges remain as not all Member States have fully developed screening systems and the systems that do exist vary [29]. Moreover, compared with the US measure in this regard, the European policy is relatively less aggressive; rather than unilaterally taking action against the Chinese inward investment, as the US CFIUS is in power, Europe emphasizes the collaboration between the various member states through a framework that encourages all member states to work together in evaluating and responding to foreign investments. This approach is designed to create a unified

[29] See ”The New Landscape of Investment Screening in Europe.” 2021

European position on Chinese investments, ensuring that all member states are on the same page and that there is a consistent policy across the EU. (Kirkegaard,2020)

4. JAPAN'S RESPONSE

In response to growing concerns over dependence on China, Japan has implemented a manufacturing subsidy policy, started in 2020 to encourage Japanese companies to relocate production from China back to Japan or other countries in Southeast Asia. According to the report[30] of officials from METI, Minister of Economy, Trade and Industry, the policy is estimated to have offered substantial financial incentives of billions of yen allocated to companies willing to transfer operations out of China. In its first two rounds, the program awarded subsidies to over 200 companies, with many relocating to Vietnam and Thailand and the third round of subsidies is expected to continue this trend.

Nikkei Articles[31] reported examples of Japanese firms engaged in the new policy, outlining that many firms, especially those operating in critical sectors securing the country's industrial competitiveness and global leadership, such as the semiconductor industry have taken advantage of the so-called "China exit subsidies" to relocate the production process out of China; this is the case of Uyemura & Co., a manufacturer specializing in electroplating process for the semiconductor industry. Before the COVID-19 pandemic, Uyemura sourced raw materials primarily from China, which were then used across its production facilities in Japan, Shenzhen, Malaysia, and Taiwan. However, to mitigate supply chain risks derived from the reliance on Chinese firms, Uyemura decided to diversify its raw material sources to regions like India, Europe. The subsidy allowed the company to not only find alternative suppliers but also to improve its domestic inspection processes by purchasing advanced equipment and expanding its factory near Osaka.

Other factors have strongly contributed Japan to reinforce its supply chains and to limit its exposure to risks. Rising labor costs in China have been one of the key factors in incentivizing Japan to explore other regions where production costs are cheaper, such as in East Asia, and increasing instability due to the Trade war between China and the USA has further pushed Japan to move in this direction.[32] As a matter of fact, Japan is one of the most vulnerable countries to the escalating tension between the two global powers. Firstly, its geographical position exposes Japan to higher risks due to its proximity to China and its military ally with the USA, which has established numerous military bases in the territory. The tension between the two countries has increased military activities in Asia Pacific regions and engaged the participation of Japan in the conflicts, for its collaboration with the U.S., as stipulated by the US-Japan alliance. Secondly, the economic relationships between

[30] Analyzed by the Report to NIKKEI ASIA"Japan companies line up for 'China exit' subsidies to come home."
[31] See " Japan companies line up for China exit' subsidies to come home.",2020
[32] See : East Asia Forum: "Japan and China's economies are adapting, not decoupling ",2024

Japan and the two countries expand the risks of geopolitical tensions; Japan has indeed economic ties with both China and the U.S. According to Japan-China economic overview report[33] in 2023 the largest trading partner of Japan was China, accounting for a share of imports, made of telecommunication and computer equipment's of 21% in 2022. On the other hand, Japan constitutes China's second-largest trade partner in 2023 with imports of semiconductor and manufacturing equipment. Japan's manufacturing sectors, particularly in electronics and automotive industries, are heavily dependent on China for both raw materials and intermediate goods. Many Japanese firms have allocated their operation facilities to take advantage of the cheap labor costs, and the disruptions might lead to the shutdown of firms due to for example supply chain risks. This is also one of the reasons why Japan has strengthened its collaboration with Asian countries, the partnership between Japan and ASEAN gives them a solid foundation to build a cooperation that benefits both sides. Together, they can tackle regional issues like trade disruptions, technology challenges, and supply chain problems[34] Japan had already been pursuing the "China Plus One" strategy, which involves maintaining a presence in China while also expanding into other countries like those in ASEAN; however, the trade war accelerated this trend, leading to more Japanese investments and reallocation of production systems in ASEAN countries as alternatives to China.

To create major dependence on China, Japan has also focused on boosting its technological competitiveness by improving its semiconductor sector. According to World Economic [35] in 2021 Japan's Ministry of Economy, Trade and Industry started a plan to revive the semiconductor industry, making it a national priority. The plan includes creating funds to support innovative technology and develop semiconductors needed for electrification and digital technology, to reduce carbon emissions, by focusing also on energy-efficient semiconductors and strengthening manufacturing in Japan.

In 2022, major Japanese companies, like Toyota and Sony, formed together a new company called Rapidus to produce advanced semiconductors for AI and this was accomplished thanks to strong financial support to this project by the government; the project foresees the country's semiconductor sales to triple by 2030. By increasing domestic production of semiconductors, Japan can reduce its reliance on foreign suppliers, namely China and the expectation of future growing sales reveals the intention of the government not only to expand the industry but also to guarantee that technological innovation is supported.

Japan aims to stabilize a strong semiconductor supply chain through international collaboration with countries that also have implemented policies, such as the United States, South Korea, and members of the European Union, to strengthen the semiconductor industry.

[33] by the Ministry of foreign Affairs
[34] See " Japan and China's economies are adapting and not decoupling. " 2024
[35] See " How Japan's semiconductor industry is leaping into the future.",2023

East Asia Forum [36]reports that Japan has established research hubs like the Leading-edge Semiconductor Technology Center (LSTC) to facilitate joint R&D projects with international institutions, the LSTC collaborates with global research entities such as IMEC in Belgium and the National Semiconductor Technology Center. International collaboration is necessary for Japan to limit the impact of supply chain disruption and create independence from reliance on critical resources, at the same time thanks to sharing cutting-edge technology, knowledge, and manufacturing equipment, Japan is aiming to achieve a competitive advantage in the technological field.

Overall, Japan's attitude towards MIC 2025 is marked by efforts to enhance its technological capabilities, reduce dependency on China, and engage in strategic international partnerships to maintain a competitive edge in the global market.

[36]See " Japan's semiconductor revival",2023

THIRD CHAPTER: CONSEQUENCES OF GLOBALIZATION ON THE CHINESE ECONOMY

1. GVC INTEGRATION AND TRADE DYNAMICS

Globalization is in every sense a double-edged-word for China, if on one hand it has pushed China to become rapidly an industrialized country, by positioning itself in the world second largest economy; on the other hand, the changing global dynamics are responsible for the new challenges for China.

Global value chains have played a crucial role in China's rise as a manufacturing powerhouse, driving its economic growth for decades. It has benefited immensely the Chinese economy, by creating numerous manufacturing jobs, and building a modern and export-led growth model. However, a recent trend reallocation of the manufacturing line out of China is affecting the country's GVC integration. "*In a June survey conducted by the European Union Chamber of Commerce in China, 23 percent of Western firms said they were considering moving operations away from the country, while 50 percent reported that business in China had become more politicized in 2021 than it had been in previous years."*[37]

Firms are deciding to move out the production line from China for many reasons; the compliance with geopolitical setting might justify their decision, for example countries allied with the U. S, such as Japan have taken new measures. As described in the second chapter many Japanese enterprises have relocated their production line out of China. The common trend of firms of "abandoning" China, that used to be the central manufacturing hub is also explained by the rising labor costs. This phenomenon is strictly connected with the effects of the new economic strategies elaborated by the MIC 2025. China's attempt to transform the labor-intensive manufacturing center into a technological-driven economy is one the causes of labor demand reduction. Another element that has pushed Chinese labor costs to rise resides in the fact that MIC 2025 is a complete centrally guided plan, for which the Government is the main director and coordinator. Liuyi, Y., Yunchan, Z. & Feirong, R in the paper [38]have suggested the connection between the Government investment and increasing labor costs in China and three channels for this causality have been identified. Firstly, the huge investment on infrastructure, for example in the transportation networks and

[37] Discussed in "Companies are fleeing China for friendlier shores", Elisabeth Braw,2022

[38] See "Does government investment push up manufacturing labor costs?" Evidence from China. *Humanit Soc Sci Commun* **10**, 694 (2023)

technological hubs that align with MIC 2025 goals, absorb workers in the infrastructure projects and high compensations are offered especially in regions lacking skilled workers. Secondly, substantial government spending in targeted sectors might crowd out private sector investment; it happens that when the government heavily finances its projects, it might somehow "steal" the available resources in the market, for example of raw materials and labor, further driving both costs up. If the constraints on resources are considered and if these are directed towards government projects, private firms may deal with shortages of resources or equivalently higher costs. Lastly, government investments that cause wages to rise incentivize firms to focus on technological research and development to reduce reliance on labor. However, the push for innovation can lead to a cyclical relationship with labor costs, as companies' investment in R&D and automation as alternative solution to the rising wages they may reduce their need for low-skilled labor but increase demand for highly skilled workers, driving up wages in high-tech sectors. This, in turn, reinforces the need for further innovation.

Wage inflation and political tensions have opened the doors for new markets that offer cost advantages and are able to replace Chinese manufactures production. It is the case of Vietnam, India, Mexico, Indonesia, and Bangladesh. The article [39] illustrates in detail the example of Apple, which seeks to transfer its production line in India to exploit the notable supply of labor pool and the decision is accompanied by recent economic reforms in the country to attract new investments in manufacturing, such as tax reduction and less stringent regulations on businesses. Numbers recorded that in 2022 Apple tripled its iPhone production in India and it has manifested the intention to continue the collaboration with India, expecting the sales in the country to increase. India's economy has recently see a rapid growth; in 2022 its GDP grew the fastest compared to any major economy. The positive economic performance in India and in other emerging countries takes place somehow at the expense of the Chinese economy. As companies move their production lines to other countries, China's position as the "world's factory" could be undermined, leading to a decline in the overall output and decrease in the export volume. Furthermore, companies' relocation might lead to increased unemployment or underemployment in affected regions, and this could particularly impact low-skilled workers.

What it is possible to observe with the increase global connection and tension as well, is the so-called "friendshoring" phenomenon, which means companies are increasingly moving their operations, not only manufacturing but also other activities, such as research and development to countries that are politically aligned or considered "friendly."[40] The new trend is evidently a sign and a consequence of the "maturation" of globalization, where the collaboration between the various countries is determined not only by economic incentives,

[39] see "Manufacturing moving out for friendlier Shores", Betsy Atkins,2023

[40] see "Companies are fleeing China for friendlier shores.", Elisabeth Braw,2022

but also by political alignment and shared values. Park in his paper [41] has expressed his insights on the current global dynamics that further reinforce this idea, stating that the new phase of global integration, dominated by the techno-nationalism ideology reflects that the economic interests are closely bounded to security concerns. This directly influences the structure and dynamics of GVCs by pushing for more localized, secure, and independent supply chains, often at the expense of global efficiency and integration. This concept is clearly exemplified by the increasing tension between the US and China.

Globalization has indeed tightened the economic relationships between the U.S. and China, with trade and supply chain integration. The interconnectedness of the two giant powers is characterized by economic interdependence and at the same time economic competition. As China seeks to escalate its position in the global value chains by producing more advanced and high-tech goods, the competition intensifies as US fears to lose its technological leadership, and the global integration has fueled the competition in various sectors, including manufacturing, consumer goods, and services. The US has therefore launched measures, such as tariff imposition to contain the Chinese rise in the key sectors where The U.S. holds its dominance.

The trade war has negatively impacted the Chinese economy. Research[42] reported the harmful repercussions on China, specifically by shedding light on the consequences of US tariffs on Chinese exports and profit reduction. Datas on the performance of 20000 firms operating in the Eastern part of China from 2013 to 2019 were selected to conduct the analysis. Some numbers from this research reveal that the US tariffs on Chinese goods and the consequent increase in goods price drastically reduced Chinese exports to the US, in detail it is found out that an increase of 1% in exports corresponded to a declined export by 4.16%. Even though Chinese exports to the US decreased, it was recognized a slight deviation and increase of it in the European market. However, there is an overall reduction in total sales, including in the domestic markets.

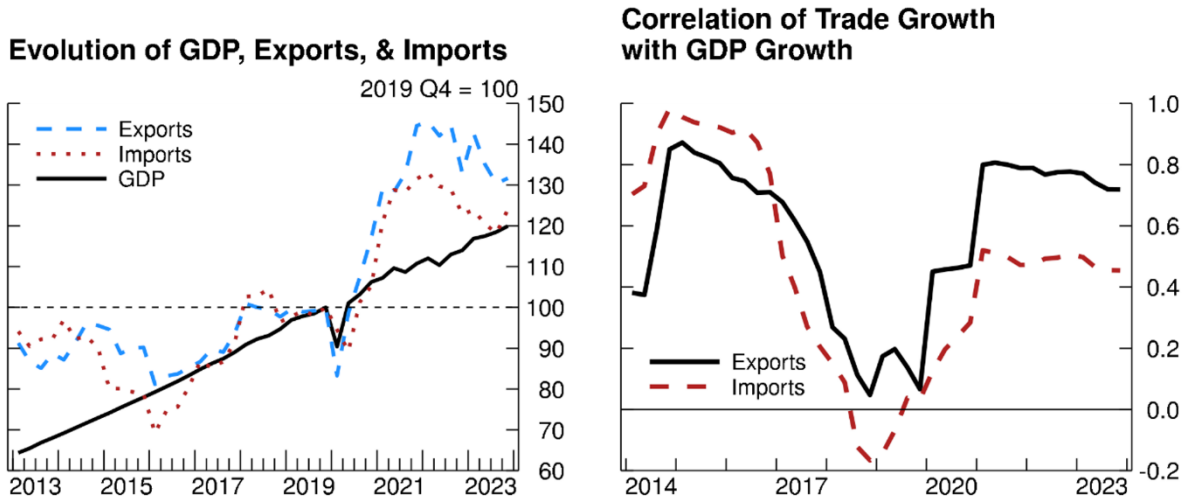
The study further explains the causes of the domestic sales reduction, in particular investigating on the factors that impeded Chinese firms to overcome the problem of price increase and to find alternative responses to the tariffs to maintain the competitiveness in the trade markets. Surveys included in this research showed that a considerable number of managers stated that they could not set a lower price, because of the already low profit margins and of the regulations of price establishment. Other reasons were found primarily in the absence of sale channels and networks, meaning that firms lack the necessary relationships and distribution methods to effectively sell the products; the consequences of this are especially evident on small firms, because of their lack of brand awareness puts obstacles in promoting their products. Other factors were identified in the different product

[41] see “Shifted paradigm in technonationalism in the 21st century”,2023

[42] More on the topic see“How Did the 2018 U.S.-China Trade War Affect China’s exporters?” Yang jiao,Zhikuo Liu, Xhiwei Tian,and Xiaxin Wang (2022). The Review of Economics and Statistics.

standards in the Chinese markets compared to that in the foreign ones and all these barriers did not allow the Chinese firms to find alternative solutions, such as in the domestic demands.

While China must undergo the various challenges posed by the increasing global tension and economic barriers resulting from a response of other countries to MIC 2025 initiative, it has been also been engaged in proactive measures to create a more self-reliant economy. In the research conducted on the extent to which Chinese independence is pursued, [43]it has been showed that China has gradually decreased its imports from foreign countries and has replaced them with domestic production.



The above statement is proved by these two graphs[44]; the left one combines the GDP growth rate, exports and imports, indicating that GDP growth rate is more strongly correlated with the export growth rate, rather than with import. The right panel once again underlines that starting from the end of 2016 Chinese export has overcome the amount of import and this gap has gradually widened in the coming years; in specific, it has been noticed a major dependence on the imports, mostly of mechanical and electrical products and of high-tech goods. Concerning high-tech sectors, not only has the import decreased because China attempted to become more self-reliant, but also there is evidence showing a decline also in the export sector, leading to an overall shrinking of high tech-trade, occurring because of more stringent investment restrictions from the US.

Another study[45] has shown that Chinese independence can be read a notably increase outward direct investments in Asia. China aims to diversify its manufacturing operations, moving production to other countries where their exports will not face U.S. tariffs. The main destination routes for the Chinese investments are programmed to be in Indonesia, Malaysia, Thailand and Vietnam. Also, countries in Europe, such as Germany, Uk and Mexico have attracted new investment from China in recent years, but less compared to Asia.

[43] Analyzed by “Assessing China's Efforts to Increase Self-Reliance", Francois De Soyers and Dylan Moore,2024
[44] source: Haver Analytics; FRB staff calculations
[45] See “ Is China financially decoupling”,Robin Brookes,2024

2. ENVIROMENTAL IMPACT AND SOCIAL INEQUALITY

The interconnected findings from the studies on technological change, automation, and the impact of "Made in China 2025" offer a comprehensive view of how these factors contribute to social inequality in China, particularly in the context of globalization.

The paper [46] reveals significant insights on how technological advancements impact wage structures and income inequality in China; specifically, it analyzes the correlation between R&D intensity and wage. Results show that companies in China that invest more in research and development (R&D) pay higher wages; it is demonstrated that when a company's R&D intensity increases, it leads to a rise in hourly wages, with the increase ranging from 3.4% to 6.9%. Furthermore, this wage increase is higher for employees who have qualifications that are valuable in R&D-focused firms, such as higher education, technical certifications, and professional or technical roles. On the other hand, lower-skilled workers that are excluded from R&D activities do not experience the same wage increases. The findings therefore align with the concept of skill-biased technological change, where technological advancements disproportionately benefit workers with higher skill levels. As R&D activities typically require specialized knowledge and expertise, workers who can contribute to or manage these activities are in higher demand, leading to higher wages for these individuals.

Building upon the insights from Mishra and Smyth (2014) on the impact of technological advancements on wage structures, the paper [47] explores another critical facet of technological change: its effects on labor conditions and well-being and social inequality. While Mishra and Smyth focus on how increased R&D intensity boosts wages for high-skilled workers, Wei et al. delve into the negative repercussions of automation in manufacturing. The paper studies how advanced machines automation affects labor in the Chinese manufacturing sectors in Guangdong province. As production lines are upgraded, workers often face increased working hours. An explanation for this phenomenon is what the authors define “deskilling”. Prior to the introduction of machines, employers were trained to acquire experience and skills that were specific to their job position, however the integration of new technological equipment and robotics to the production lines has replaced the tasks that workers used to do, making these workers devalued as machines are able not only to take their jobs but also to accomplish the tasks better. As a result, companies may prefer to hire cheaper, low-skilled workers instead of those with middle-level skills, who are indeed those mostly affected by the introduction of machines. The consequence of this is that workers with medium skills might need to either find new jobs or take lower-paying positions, which can make them feel overqualified for their jobs. This pressure can lead to increased stress and longer working hours as an effort to avoid losing their jobs. There might be exceptions, for

[46] See “Technological Change and Wages in China” by Mishra and Smyth,2014
[47] See Production Automation Upgrades and the Mystery of Workers’ Overwork by Wei et al. (2024)

example workers with higher degree of education and trade unions are more protected and neutral from the impact of machines on the extended working hours.

Moreover, it is shown that when companies update their production lines workers must follow the machines speed and therefore loose a certain degree of independence, compared to previous conditions where the employees could establish by themselves the working rhythm and how to distribute the tasks. Whereas now, with advanced machines handling many tasks, the speed and efficiency of production increases, leading to higher production targets and pushing workers to work longer hours to meet these new demands. Longer working hours are compensated with extra wages, not only becoming an incentive for the worker to put in more effort, but also increasing inequalities, as this increase in wages is not the same for everyone, some workers might see more pay, while others might not benefit as much. Also, companies may not need to offer high wages to keep skilled workers if new jobs only need basic skills.

The study suggests an increase in psychological stress and negative emotions of workers after spending prolonged periods working with machines. Workers experiencing higher stress and psychological issues may find it harder to perform their jobs effectively, potentially impacting their job security and wages. This can lead to economic disparities where lower-skilled workers, who are more likely to be affected, face greater financial and emotional challenges compared to their higher-skilled workers.

The paper [48] shows some discoveries on the impact of technological hubs creation, launched by MIC 2025 on the labor market. Evidence shows that the policy has led to a more pronounced economic disparity across workers and regions with the technological clusters establishments and those where there were not, at least in a brief period after the policy implementation. These “privileged” areas, also called pilot cities, account for only a small share of a total of 335 cities and are those prioritized for the implementation of MIC 2025, attracting immense amount of funding to the high-tech firms. Financial support from the government expanded new job opportunities in these cities and offered higher wages because of increased labor demands in high-tech firms. The paper reports some empirical results to concretize the specific impact of the technological hubs on the labor market, stating that the job opening rate in the targeted cities rose nearly 20% immediately after the policy implementation, and just two years after, it reached about 50%. However, the new setting, by sucking workers from the neighboring regions, who might receive better working compensations, causes the less advantaged cities to lose labor force and firms basements, both necessary for economic growth. Nevertheless, the negative impact on the non-pilot cities was temporary, as soon after the project was launched the wage gap and labor demand difference was notably more favorable for the pilot cities; eventually over the years the labor market in the surrounding areas improved. Job openings gradually increased, while the recovery in wages took longer than the recovery in job openings and did not show a positive trend. The study observes that, regardless of the short-negative impact of the new technological transition on the non-pilot cities, there is a positive spillover effect on the labor

[48] See“High-Tech Clusters, Labor Demand, and Inequality: Evidence from “Made in China 2025” by Park and Shen

demand in these cities in the long - run, thanks to the economic growth and innovation generated by high-tech centers in the pilot cities. This might happen for example when high-tech companies in the main areas grow, they may need to expand their operations. This can lead to the establishing of facilities or partnerships in nearby regions, or when surrounding areas might develop new businesses or strengthen existing ones to supply goods and services to the high-tech industries in the pilot cities, creating new job opportunities and stimulating the local economy. The outcome is therefore a mixed effect on the neighboring cities, where in the long term the labor demand caught up faster after the policy implementation, whereas the wage stagnation emphasized income inequality.

The paper also finds out increase social inequality inside the pilot cities, especially because of the widening gap between wages of high-skilled workers and those who oversee standard and basic operations. This discrepancy is worsened by the rising housing costs in the targeted areas, due to an increase in the incoming stream of workers. While the rising wage of the skilled professionals has been able to offset the higher living costs, the low skill workers have been mostly afflicted, counting for an impactful welfare loss.

These findings collectively underscore how globalization, through policies like MIC 2025, and technological advancements contribute to social inequality. The benefits of globalization and technology are concentrated among those with the skills to thrive in a high-tech economy, while those without these skills are left behind. Additionally, the wage gap is also exacerbated by the diverse levels of technological upgrading brought in different regions of China, leading to an economic disparity between more and less developed cities. Finally, the well-being of workers in the light of technological changes is also explored, with the conclusion that there is worsening conditions for labor, such as longer working hours, less independent and more tedious tasks, all impacting the work environmental quality and employees' mental health.

The Chinese government has introduced several policies to address income inequality. The president Xi Jinping has promoted a common prosperity plan to guarantee more equal wealth distribution across different social groups and regions. The strategy is not only a manifestation of Chinese ideology of socialism, but it is also an economic reform to overcome the limit of economic expansion due to income inequality.

For example, Chinese policy is addressing regional disparity by having wealthier coastal provinces help poorer inland ones. This means that a richer coastal province provides financial aid, resources and skilled workers to a less developed inland province. In the context of MIC 2025, this policy serves a dual purpose: it not only helps to balance regional development but also ensures that the benefits of advanced manufacturing and high-tech growth are more evenly distributed.
Reducing regional differences is closely tied to offering more equal public services, which is key to achieving common prosperity. The main goals are to lower education costs for low-

income families, improve pensions and healthcare, and provide affordable housing, especially in cities with many migrants. [49]

Since 2010 China has consistently implemented annual increases in minimum wages, especially after a period of slowdown caused by the global financial crisis of 2009. According to the Ministry of Human Resources and Social security, there is an upward trend in the minimum wage rise and Between 2006 and 2024, the minimum wage averaged 1,830.53 CNY per month in China, with a peak of 2,590.00 CNY per month in 2021, compared to 690.00 CNY per month in 2006.
Moreover, it has been noticed that there has been an increase in the wage in the private sectors where wages tend to be lower compared to state-owned enterprises (SOEs). In this way the Government is targeting wage disparities in sectors that are most affected by technological advancement.

Other policies aimed at tackling income inequality include the Vocational training, which are educational programs and courses designed to provide students or workers with skills and experience necessary for specific job positions and industries. Vocational training is vital in addressing income inequality, especially under the Made in China 2025 initiative. In fact, in a more technologically imprinted society, low-skilled workers might encounter the risk of losing their jobs due to automation. Vocational training programs help these workers acquire new skills, enabling them to move into emerging sectors promoted by MIC 2025 and to adapt to the new social changes.

Moreover, Vocational training in cutting-edge fields creates opportunities for workers to move up economically. Those who are stuck in low-wage limits can receive higher earnings by gaining skills that are in high demand. This contributes to a fairer distribution of income, as more individuals can access well-paying jobs in advanced manufacturing. In addition, the government role is also vital, since through MIC 2025, it works with industry leaders to develop vocational training programs that meet the demands of the evolving job market. This collaboration ensures that workers acquire skills that are directly relevant and valuable, such as AI programming and advanced machinery operation.

The "Made in China 2025” plan promotes manufacturing industry upgrade, with focus on advanced innovation, such as introducing cleaner technologies and better use of resources. However, the rapid growth of new industries might also lead to environmental degradation. At the same time, MIC 2025 is linked to global trends, meaning that its implementation is strictly affected by the rising awareness on environmental standards. Therefore, the global push for sustainability challenges China to balance technological advancement with environmental protection, ensuring that its industrial growth aligns with both national and international environmental goals.

[49] See China’s common properity program: causes, challenges and implications by Guoguang Wu

In this context, two key studies provide valuable insights into the environmental impact of MIC 2025. The first study[50] by Wang et al investigate the environmental impact of Chinese technological advancement. Empirical results from the study illustrate a correlation between an upward trend of the industrial upgrade index and the industrial sustainable efficiency in the span time from 2005 to 2019.

The results, following previous findings, affirm that technological upgrade positively affects ecological performance, here it collects two keyways for this to happen. Firstly, technological advancement enhances production efficiency, which measures the capability of economic activities to convert resources into value while minimizing environmental impact. Higher production efficiency means reducing costs for business because of better resource allocation and less waste. It implies that fewer emissions are generated per unit of product, contributing not only to reducing costs for business because of better resource allocation and less waste, it also implies that fewer emissions are generated per unit of product, contributing to better environmental outcomes.

Productivity efficiency must be accompanied by energy efficiency to obtain an evident positive ecological impact. In fact, the authors state that if the output increase is achieved through the dependence on old energy sources, this might even create more harmful effects. Technological advancement therefore allows us to find alternative energy sources, replacing the traditional fuel-consumption-based economy, which is extremely damaging for the environment. Lin and Liu suggested that coal reliance is driven by economic benefits, however, China is considering transitioning to other forms of energy consumption; this means integrating the usage of renewable and clean energy that limits the number of emissions and reduces pollution.

The paper also delves into the different degree of technological upgrade in the various industries, showing that China, aligning with the global standards of green development, recognizes a high trend of industrial upgrade degree in sectors like high-tech and advanced manufacturing for computers, machinery and electric equipment, whereas coal Mining ,petroleum and gas extraction industry are the ones with less degree of upgrade. An explanation is that mining industries are those polluting the most, hence those experiencing a significant decline in production demands. Additionally, the focus is directed towards the upgrade of manufacturing thanks to technological innovation, contributing to reduced energy consumed. Having observed an increasing gap between the various industries' level of upgrade, the author suggests that, to reach a more effective overall emission reduction, new measures must be taken with particular attention to the least “developed” industries.

Overall, the paper expresses an optimistic position on the benefits of industrial upgrading, pointing out its multiple advantages on contributing to business for a more sustainable growth, reducing the energy usage and net emissions.

[50] See “Does industrial upgrading improve eco-efficiency?”,2023

Analogously, the second paper [51] demonstrates the positive outcome of how improving industry's structure can make a more efficient and more environmentally friendly use of land. When industries upgrade, the resource allocation changes, causing them to shift away from outdated industries like steel and textiles to support the growth of new industries like renewable energy and advanced materials. As new industries grow, they push out older ones especially when consumer demand for modern technology driven by the market leads to the decline of outdated, causing these older industries to move out of city centers.

These changes promote technological advancements and creates clusters of economic activity, and more land is being employed for new and productive industries, for example like finance and insurance companies will be localized in central urban areas, while polluting and inefficient industries will move away from city centers. In conclusion, the study underscores the aligning of industrial development with sustainable land use to support long-term economic and environmental goals.

3. FINANCIAL VULNERABILITIES

"Made in China 2025" raises significant concerns regarding the country's financial stability. By encouraging local governments to attract high-tech industries MIC 2025 has led to rising debt levels among these governments. The emphasis on rapid industrial upgrading and technological advancements requires considerable financial resources, creating vulnerabilities within China's banking system through increasing risk of non-performing loans. There is evidence showing a growing trend of government debt increase. According to the official authorities, the total government debt in China has skyrocketed in the last years, from less than 18% of GDP in 2016 to 91% of GDP by 2021. See Geng and Qian (2024).[52]

MIC 2025 encourages local governments across China to attract high-tech industries to their regions, for example offering favorable policies, such as subsidies and tax incentives. This leads to intense competition among local governments to secure investment in the advanced manufacturing sectors. The paper [53] has discovered that debt default risks are more common in regions where the political competition among local governments is more intense. It reports that numerous studies have shown that the political factor is the most influencing determinant of local leaders' decisions, and therefore impacting the debt structure in China. To confirm this, it is proven that leaders, who are at a critical stage of their political career, are the ones most inclined to act by political incentives, rather than socio-economic considerations. This phenomenon is explicated by the centralized and hierarchical system that characterizes China, in the sense that central government leaders have significant control

[51] Discussed in "Industrial upgrading and its influence on green land use efficiency", Chang et al, 2023
[52] analyzed in" Understanding the local government debt in China."
[53] See "Political Competition, Spatial Interactions, and Default Risk of Local Government Debts in China"by Yu et al

over the promotion and career advancement of lower-level officials, like city or county leaders. Therefore, Local officials are heavily incentivized to align their actions with the objectives of higher authorities to secure their career advancement. In the context of MIC 2025, local governments are incentivized to boost economic growth through industrial upgrades and high-tech investments by borrowing heavily to pursue a quick and visible result quickly.

The intensifying competition between the local governments and its impact on increasing indebtedness might disrupt financial market stability. The main channel through which local authorities receive funds are borrowings from commercial banks; according to the results shown by the paper [54] in 2023 commercial banks possessed over 82% of these bonds, [55]: This large share indicates that banks are the predominant purchasers of these bonds, which local governments issue to receive capital to finance various projects. Moreover, local government bonds are held in the banks' balance sheet until maturity and are not traded in the secondary market. This practice ensures a stable cash flow and reliable long-term funding for local governments, without the need to continuously refinance their debts, but at the same time limits liquidity in the bond market. This might impact the trading process in the bond market, especially impeding investors from easily selling the bonds. Whereas banks holding local government bonds to maturity shift the risk of debt default entirely on their own. If local governments face financial difficulties, the banks holding these bonds may experience increased credit risk, impacting the overall bank system.

Furthermore, the study points out another issue derived from the increasing indebtedness of local officials, affecting the financial stability of other firms. When local government demand for capital to be invested in new projects increases, it might happen that private sectors are deprived of financial resources to sustain long term operations. As private sector credit is crowded out, businesses may face financial constraints that limit their growth potential, leading to slower economic expansion and shrinking private sector activities can lead to lower tax revenues for local governments. Reduced economic activity means less income and sales tax revenue, which can further affect local government finances and their ability to repay debt, further transferring the risk to commercial banks.

Another factor expands the risk of local government debts on financial institutions, according to the article[56], it resides in the political influence over the monetary system in China. Many commercial banks are state-owned, and this lack of independence might lead them to buy government bonds to align with the centralized objectives, regardless of the creditworthiness of local governments. Knowing that state-owned banks are incentivized to purchase their bonds, local governments might engage in even riskier financial behavior. The study suggests that the local government debt is the main destabilizer of China's financial situation, almost reaching the limits set by the government in 2018.

[54] See The Financialization of Local Government Debt in China and its risk transmission to commercial banks"
[55] source: China Bond Information Network
[56] "The Financial Situation in China: Issues and Challenges"

Financial stability is deteriorated with the practice of hidden debts. Typical examples include the government providing guarantees for local government financing platforms and backing private companies that participate in Public-Private Partnership (PPP) projects. It happens that local governments assume risks that would typically be handled by the private companies, and if these businesses fail, the local government is left to cover their debt. Although such hidden debt is not officially permitted, it continues to grow.

As far as global interconnectedness is concerned, the increasing debt level in China means a serious of consequences on the country' economy. For instance, there might be changes in the inward capital flow, such that there is a decline in the investment level in China, as international investors start to lose confidence; the case is that they will direct resources in more stable investment projects, slowing consequently the pace of economic growth in China.

Additionally, if Chinese government debt levels become unbearable, it might happen that Chinse currency (Renminbi) is likely to depreciate. As investors become more alert of this fact, they might start selling the assets denominated in Renminbi, fearing that it might lose value. Moreover, the currency Depreciation makes imports more expensive, causing higher inflation. Overall, unsustainable government debt can trigger a vicious cycle: as debt levels in China rises, investment falls, leading to currency depreciation and higher borrowing costs, which in turn further deplete the government's financial resources.

CONCLUSION

The initiative “Made in China 2025” bid to make China competitive in the world’s high-tech industries and advanced production systems. These objectives have been partially achieved with evident progress in technologies and growth of the economy. From my perspective, this policy is not only a reflection of China's ambition to become self-reliant in critical industries like information technology, smart manufacturing, but also indicates a necessary response to the shifting dynamics of the global economy. With technological advancement becoming the primary driver of economic power, the policy addresses the urgent need for China to reduce its dependence on foreign technology and build its own innovation system.

On one hand the progress made under "Made in China 2025" is undeniable, especially in sectors like 5G technology development, exemplified by the case of Huawei, which has placed the country ahead of many advanced economies. Additionally, China’s leadership in electric vehicle manufacturing and green energy solutions is reshaping global industries. In these sectors, China has not only caught up with, but in some cases, surpassed Western countries’ achievements. This a prospect for Chinese future technological dominance, especially as the global economy increasingly shifts toward sustainability and digital transformation.

However, China still faces considerable challenges, especially in high-end manufacturing. China remains reliant on foreign technology, particularly on the United States and Europe for critical components such as microchips. This clearly shows that even though China has made significant progress, it has not achieved yet full technological self-sufficiency and global leadership across all sectors.

China’s global position in technological leadership will depend on how it navigates two key challenges. Firstly, the geopolitical tensions restrict China’s access to key technologies and limit its expansion in foreign markets. In today’s increasingly interconnected world, it’s understandable that major economies-the United States, Europe, and Japan- would respond cautiously to China’s new policy. These countries, fearing China’s rise in sectors they have traditionally dominated, have implemented protective measures, like tariffs investment restrictions, and offshoring Chinese manufacturing. To counter this, China must accelerate its domestic innovation capabilities and focus on creating an ecosystem that supports independent technological growth. This will require massive investment in R&D, Government subsidies plans and talent development programs, especially in high-tech sectors where China is still in a disadvantaged position.

Second, China must address internal challenges like rising local government debt, income inequality, and a lack of skilled labor to manage the sophisticated technology needed for its ambitious plans. The shortage of skilled workers capable of adapting to complex technical processes puts China in common with many rapidly developing economies: a skills gap between the ambitions of policymakers and the actual shortage of a suitable workforce. This

gap may slow progress and increase existing inequalities in the labor market. At the same time, local governments' debt pressures could limit the financial resources available for investment in cutting-edge technologies and without addressing the widening income gap, unequal wealth distribution is going to aggravate.

Looking to the future, I believe China has the potential to emerge as a leading technological superpower, but this will require a recalibration of both internal and external strategies. Domestically, China needs to upskill its labor force, promote technological education, and ensure more equitable economic development across regions. Externally, China must remain engaged in global markets and technological collaborations, even as trade tensions and protectionism rise. If China isolates itself from the global technological ecosystem, it risks slowing its progress. Most importantly, China must exercise patience. Achieving technological dominance cannot be rushed, especially when compared to the Western countries that have had decades to cultivate their technological leadership. Trying to outpace other global leaders in a short period may lead to instability and irrational decisions. Instead, China should focus on steady progress as long-term success in technological innovation requires time.

From my point of view, the global economy will continue to be impacted by MIC 2025. While China's rise in high-tech sectors has brought challenges to the global order, it potentially offers opportunities for collaboration in fields such as, infrastructure development and digital technology. As China's economic influence grows, countries around the world will need to leverage between the degree of competition and cooperation. The U.S. and Europe may need to rethink about their approaches with China, to protect their technological interests while engaging in collaboration with China to address global issues like climate change and economic development. On the other hand, China will need to demonstrate that its rise in high-tech industries can be mutually beneficial. If China can foster international collaboration while pursuing its technological goals, the global economy could see unprecedented growth in innovation and sustainable development.

In conclusion, China’s technological competitiveness is expanding, however, significant challenges must be considered. China's ability to become a global tech leader will depend on how it tackles its internal weaknesses and external pressures. MIC 2025 has already had a profound global impact, driving both competition and cooperation in the global technological landscape. As China continues to achieve its technological advancement, the world will need to adapt to this new reality. The future of China’s economy, and the global economy itself will depend on how countries navigate the complex dynamics of competition, trade tensions, and the need for collaboration.

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