August 2024

科技、民主與社會研究中心
Research Institute for **Democracy, Society** and **Emerging Technology**

The Remote Poaching Model:

How China's Bitmain Acquired Taiwan's Edge AI Chip Technology and Its Implications for Economic Security

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About DSET

Emerging technologies are dramatically transforming the political, economic, and social environments globally. It is crucial to mitigate their negative impacts and steer their use towards improving societal well-being. This requires the formulation of holistic, interdisciplinary policies that deeply consider human and societal concerns to effectively assess and respond to how these technologies affect democracy and society.

In Taiwan, the challenge is the cross-border influence of digital authoritarianism. To counter this, it is essential to develop a governance strategy that safeguards the democratic system, strengthens national security, and fosters social equality.

The National Science and Technology Council has sponsored the creation of the Research Institute for Democracy, Society, and Emerging Technology (DSET) to address these critical issues. As a national think tank, DSET's mission is to generate policy recommendations that cater to the democratic and societal needs while providing a distinct Taiwanese perspective to the global community.

DSET is guided by five principal values: democracy, inclusiveness, sustainability, resilience, and innovation. These values direct the institute’s efforts in shaping technological development that prioritizes the benefits of democracy.

The name DSET emphasizes democracy ("D") as the foundational element, symbolizing its pivotal role in our policy research. This choice underscores the idea of letting democracy set the direction for technological advancements that enhance public welfare through upholding democratic principles.

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Acknowledgments

On behalf of the Research Institute for Democracy, Society, and Emerging Technology (DSET), we extend our deepest gratitude to the numerous individuals and organizations whose generous support and unwavering commitment have been instrumental in our pursuit of a more democratic, inclusive, and technologically advanced society.

We are particularly thankful to the National Science and Technology Council for their sponsorship and continued faith in our mission. Their support not only empowers our research but also reinforces Taiwan's commitment to maintaining a democratic ethos in the face of global technological challenges.

Our sincere appreciation also goes out to our fellow researchers and staff, whose dedication and expertise drive the core of our operations. Their relentless pursuit of knowledge and innovation ensures that our work not only meets but exceeds the rigorous standards of scholarly excellence.

We also thank the international community for their collaboration and engagement. Their diverse perspectives enrich our understanding and help to disseminate our findings on a global scale, promoting the values of democracy and technological governance worldwide.

Lastly, we acknowledge the citizens of Taiwan, whose resilient support for democratic values inspires our work every day. It is for them that we strive to craft policies that ensure technology serves as a bridge to a more equitable and prosperous future, rather than a barrier.

Together, with the support of these vital partners, DSET is set to continue leading the way in shaping a future where technology and democracy thrive in harmony.

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Beijing Shenshi Hongming Investment Fund Management Co., Ltd. (Beijing Shenshi Hongming)	北京盛世宏明投資基金管理有限公司
Beijing Integrated Circuit Industry Fund	北京市集成電路產業母基金
strategic emerging industries	國家戰略性新興產業
high-tech industry development	高新技術產業發展
13th Five-Year Plan for National Strategic Emerging Industries Development	「十三五」國家戰略性新興產業發展規劃
Shenzhen Century Cloud Core Technology	深圳市世紀雲芯科技
Fujian Zhanhua Intelligent Technology	福建湛華智能科技
Fujian Electronics & Information Group	福建省電子信息集團
Fujian Domain Big Data Technology Co., Ltd.	福建省算域大數據科技有限公司
Fuzhou Urban Brain Industry Alliance and the Fuzhou Urban Brain Research Institute	福州城市大腦產業聯盟暨福州城市大腦研究院
Beijing Jingshi Intelligent Technology Co., Ltd. (Beijing Jingshi)	北京晶視智能科技有限公司
Beijing Zhiyun City Investment Fund (Beijing Zhiyun)	北京智慧雲城投資基金
Beijing E-hualu Information Technology Co., Ltd. (Beijing E-hualu)	北京易華錄信息技術股份有限公司
Leading Capital	力鼎資本
Data Lake+	數據湖 +
Beijing Si Nian Mainland Technology Center	北京斯年大陸科技中心
Jiaxing Leading Songying Equity Shares Investment Management Co., Ltd.	嘉興力鼎松盈股權投資合夥企業

English	Chinese
Hubei Xiaomi Changjiang Industrial Fund Management Co., Ltd.	湖北小米長江產業基金合夥企業
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Ningbo Meishan Free Trade Port Zone Zhongwei Dingxin Asset Management Co., Ltd.	寧波梅山保稅港區中維鼎信資產管理有限公司
Shanghai Sizhong Technology Co., Ltd.	上海鏗鐘科技有限公司
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IC Link Limited Company	芯道互聯
WiseCore Technology Co., Ltd.	智鈊科技
Sophon Technologies Ltd.	算豐科技有限公司
Shenzhen Intelligence Cloudic Technology Co., Ltd.	深圳市智能雲芯科技有限公司
SOPHGO	算能科技

Executive Summary

1. One of the most significant impacts of the US-China tech rivalry on TSMC's revenue was the halt in shipments to Huawei, which began in late Q3 2020. However, TSMC's revenue from China has recently reached a new high, with Q2 2024 figures not only returning to pre-Huawei levels but even slightly surpassing them. Despite US-led export controls, TSMC remains crucial to global technological innovation, including advancements in Chinese high-performance computing (HPC) products.

2. Bitmain, a leading Chinese IC design enterprise and supplier of cryptocurrency mining machines, has emerged as a significant player aiming to challenge the AI chip market dominance of Nvidia and AMD. In recent quarters, Bitmain has allegedly driven TSMC's shipment of 3nm chips. Co-founders Micree Zhan and Jihan Wu played crucial roles in Bitmain's operations, establishing a global company structure and securing significant investments aligned with China's semiconductor industry strategy. Following the cryptocurrency boom, Bitmain collaborated with local Chinese governments to develop AI chip technology for smart cities.

3. Bitmain's edge AI chip development progressed through Beijing Jingshi, a company bolstered by the technical expertise of Taiwanese engineers and substantial investments from Chinese entities, including significant backing from Beijing E-hualu and Xiaomi Group. The company's shareholding structure highlights the collaboration between Taiwanese technology and Chinese capital. Bitmain leverages Taiwan's semiconductor expertise through a "remote poaching" model, employing Taiwanese engineers at WiseCore Tech for chip design, manufacturing by TSMC and packaging and testing by ASE, all without relocating the engineers. This model provides a prototype for analyzing other instances of Chinese poaching within Taiwan's semiconductor industry and serves as a reference for the global IC design industry in its efforts to address Chinese technological acquisition efforts.

4. In March 2021, Taiwanese authorities launched an investigation that disrupted Bitmain's access to Taiwanese AI chip technology, ultimately leading to the dissolution of WiseCore Tech and significant changes in Beijing Jingshi's ownership. This legal action severed the link between the two companies, reinforcing Taiwan's economic security framework against unauthorized Chinese investments and technology transfers. However, from a legal standpoint, the investigation primarily focused on Bitmain's failure to comply with investment review procedures rather than on the protection of specific semiconductor technologies. This situation raises important questions about which home-grown semiconductor technologies should be safeguarded and how unauthorized use by China could harm Taiwan's national interests. The "remote poaching" model used by Bitmain to transfer Taiwanese R&D expertise and technology underscores the urgent need for Taiwan to strengthen its economic security legal framework. Identifying and regulating key IC design technologies is essential to enhance Taiwan's ability to manage supply chain security amidst the US-China tech rivalry.

Why Bitmain Matters?

TSMC's "New" China Boom?

In Q2 2024, Taiwan Semiconductor Manufacturing Company (TSMC) achieved a new revenue high from China, marking a significant milestone since the onset of the US-China tech rivalry and making headlines in the semiconductor industry. TSMC's operations, particularly its interactions with U.S. and Chinese clients, are highly sensitive in the context of the ongoing tech competition between the two superpowers. While the Chinese market was once a lucrative opportunity for TSMC and other semiconductor firms, it now presents increasing commercial risks and uncertainties, especially under the scrutiny of U.S.-led international export controls.

TSMC, with its advanced wafer manufacturing technology and pure-play foundry model, plays a critical role in driving technological innovations, including in fields like Artificial Intelligence (AI) and quantum computing. In the broader context of the U.S.-China tech rivalry, where investments and policies in AI technology resemble an arms race, Taiwan's TSMC stands as the arsenal of the global semiconductor industry. It plays a crucial role in helping the U.S. and its allies develop and implement advanced technological concepts. Without TSMC as a key partner, the U.S. could face significant challenges in profiting from chip design, which would hinder ongoing research and development and the pursuit of cutting-edge technology at an economically viable cost. The same logic applies to Chinese chip design companies; maintaining a cooperative relationship with TSMC remains essential for advancing China's chip and AI technology.

The recent growth in TSMC's revenue underscores this dynamic. Although current U.S. Export Administration Regulations (EAR) and its extraterritorial reach do not directly limit chip manufacturing nodes, they do restrict the sale of high-performance computing (HPC) products and AI chips with specifications above certain thresholds to China, depending on their end-use.[1] In this regulatory landscape, Chinese chip manufacturers have recently ramped up their orders for designs below 7nm at TSMC, likely in anticipation of tighter U.S. export controls.[2]

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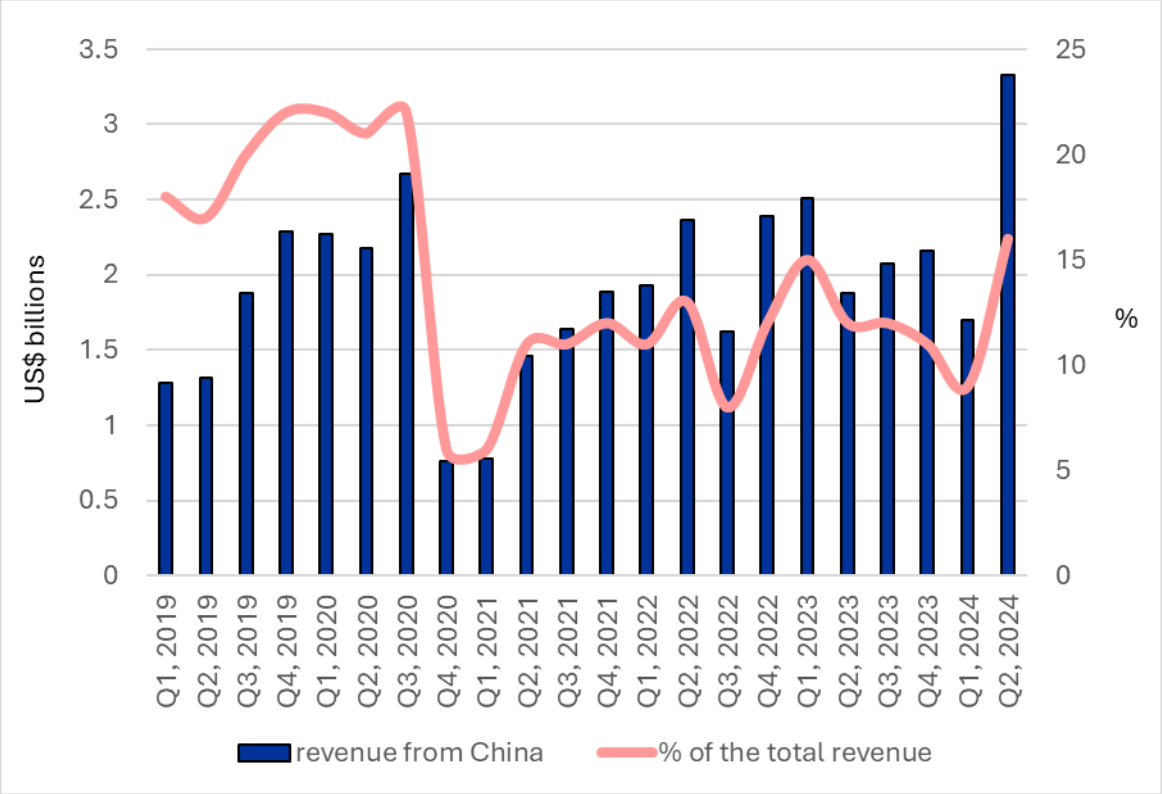
[1] Reinsch, W. A., Schleich, M., & Denamiel, T. (2023, October 20). Insight into the U.S. semiconductor export controls update. Center for Strategic and International Studies. Retrieved from https://www.csis.org/analysis/insight-us-semiconductor-export-controls-update

[2] Chen, Y.-C. (2024, July 18). TSMC's Six Key Points at the Earnings Call: First Definition of Wafer Manufacturing 2.0 [台積法說六大重點一次看　首度定義晶圓製造 2.0]. Digitimes. Retrieved from https://www.digitimes.com.tw/tech/dt/n/shwnws.asp?CnlID=1&id=697594&query=%E6%AF%94%E7%89%B9

Bitmain's Vow to Replace Nvidia

TSMC's Chinese HPC clients include major players such as Bitmain Technologies Ltd. (Bitmain), Alibaba's Pingtouge, and ZTE Microelectronics, as well as new collaborations in 2024 with companies like MetaX and Enflame.[3] In Q2 2024, TSMC's revenue from China surged to 16% of its total revenue, up from 9% in the previous quarter—a significant increase. (See Figure 1) This proportion is especially notable when compared to the period after Huawei was added to the U.S. Entity List, which prevented TSMC from shipping to Huawei starting in late Q3 2020. At that time, TSMC's quarterly revenue from China was 22%, approximately US$2.67 billion. (See Figure 1) Although the recent percentage has not yet returned to those past levels, the absolute revenue from China in Q2 2024 has surpassed the pre-sanction peak, reaching approximately US$3.33 billion.



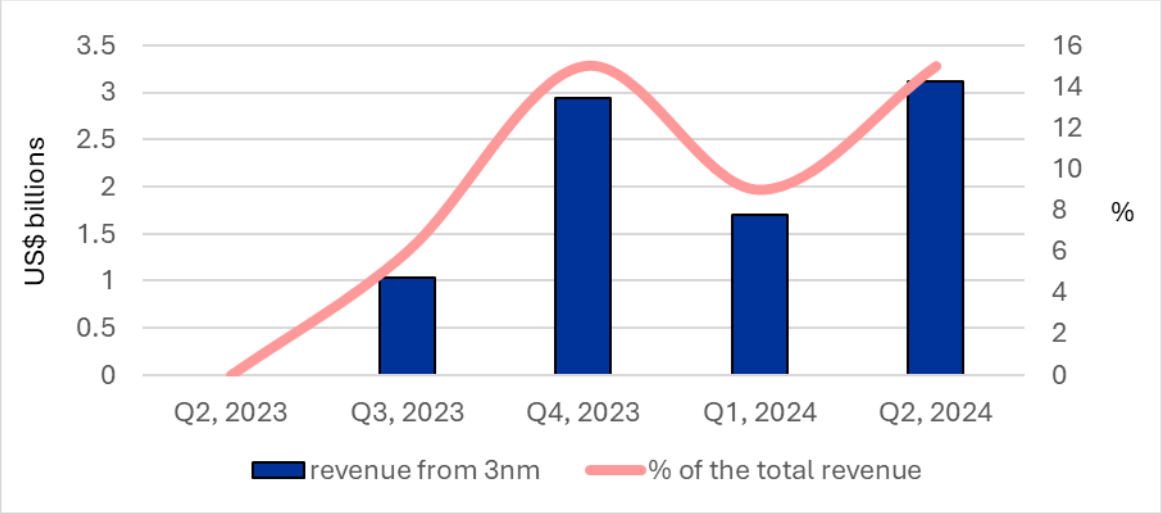
Sources: TSMC's annual reports (Taiwan Stock Exchange: 2330)

Figure 1 : TSMC's Quarterly Revenue from China

%E5%A4%A7%E9%99%B8

[3] Chen, Y.-C. (2024, July 24). TSMC Super Hot Runs: Chinese Customers Increase Prices by 40% to Secure Orders [台積 super hot runs 爆單　中國客戶加價 40%搶投片]. Digitimes. Retrieved from https://www.digitimes.com.tw/tech/dt/n/shwnws.asp?CnlID=1&id=697877&query=%E6%AF%94%E7%89%B9%E5%A4%A7%E9%99%B8

Among Chinese chip design companies, Bitmain has garnered significant attention, particularly for its alleged role in driving the surge in TSMC's 3nm product shipments due to its demand for cryptocurrency mining machines. (See Figure 2) During the booming international cryptocurrency market of 2017 and 2018, Bitmain was one of TSMC's top five global customers, accounting for over 10% of TSMC's total revenue in 2017. In recent years, Bitmain has closely collaborated with TSMC, leveraging its advanced manufacturing technology for its mining machines.[4]



Sources: TSMC's annual reports (Taiwan Stock Exchange: 2330)

Figure 2 : TSMC's Revenue from 3nm Wafers

However, following the mining boom, Bitmain has shifted its focus to the potential of application-specific integrated circuits (ASICs) in the AI chip market. For Bitmain, ASICs are no longer just about enhancing cryptocurrency mining capabilities; the same development logic can be applied to AI chips. Although Bitmain's ASICs may not match the advanced specifications of Nvidia or AMD, they still demonstrate exceptional deep learning capabilities in specific applications. In May 2018, Bitmain's founder Jihan Wu stated in an interview that the company would enter the AI chip business, aiming to challenge the market dominance of Intel, Nvidia, and AMD. This ambition aligns with the Chinese government's goal of becoming a global leader in AI technology by 2030.[5]

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[4] TechNOW Voice. (2024, July 24). Bitmain's 3nm Mining Machine Chip Shipments Boost TSMC's Revenue Share in China; Sources Suggest Xiaomi Will Also Launch 3nm Chips [比特大陸 3nm 挖礦機晶片出貨，台積電中國營收占比衝高，傳小米也會開案 3nm 晶片]. TechNOW Voice. Retrieved from https://cn.technowvoice.com/article_detail/台积电比特大陆 3nm

[5] Chafkin, M., & Ramli, D. (2018, May 18). The World's Dominant Crypto-Mining Company Wants to Own AI. Bloomberg. Retrieved from https://www.bloomberg.com/news/features/2018-05-17/china-s-crypto-chips-king-sets-his-sights-on-ai

Bitmain, as an IC design company actively expanding into the AI chip market and aligning with China's narrative of AI technological self-sufficiency, is notably absent from the U.S. Entity List. Like other Chinese IC design companies producing HPC products, Bitmain completes its designs in China and outsources manufacturing to TSMC, significantly contributing to TSMC's revenue growth from China. However, as early as 2021, the Taiwanese government began investigating Bitmain for illegally poaching Taiwanese engineers.

In March 2021, the New Taipei City Prosecutors Office (NTCPO) directed the Investigation Bureau to raid Bitmain's operations in Taiwan, summoning 20 individuals for questioning and accusing the company of illegally recruiting Taiwanese semiconductor engineers and conducting R&D operations in Taiwan. This was the first publicized action by Taiwanese authorities against Chinese infiltration of Taiwan's semiconductor industry since the onset of the U.S.-China tech rivalry. Over the following year, multiple similar cases were uncovered. By August, the NTCPO concluded the investigation. Four Taiwanese defendants pleaded guilty to violating Taiwan's regulations on conducting business with China without permission. The prosecutors ultimately settled with deferred prosecution and fines of NT$300,000 each.[6]

Although formal charges were not pursued, these actions sent a strong political message and contributed to a degree of economic decoupling between Taiwan and China in the semiconductor industry. This report will examine Bitmain's evolution from cryptocurrency mining machines to AI chips, analyze the involvement of Taiwanese engineers in Bitmain's R&D, and assess the implications of Taiwan's investigations for its economic security framework. It will also explore how Taiwan's measures should evolve to counter China's ambitions for AI chip self-sufficiency.

[6] New Taipei City District Prosecutors Office [臺灣新北地方檢察署]. (2021, August 23). Investigation of WiseCore and IC Link for Violations of the Act Governing Relations between the People of the Taiwan Area and the Mainland Area Concluded with Deferred Prosecution [新北地檢署偵辦智〇、芯〇公司違反臺灣地區與大陸地區人民關係條例案件，業經偵查終結，為緩起訴處分].

From Mining Machines to AI Chips

Bitmain's reliance on TSMC

Before the Chinese government imposed restrictions on cryptocurrency development, Bitmain was one of the world's leading suppliers of cryptocurrency mining machines. Since 2015, over 99% of Bitmain's revenue has been tied to mining activities, with more than 70% coming from the sale of mining machines. Bitmain held a dominant 74.5% share of the global market.[7] The complex computational power required for cryptocurrency mining depends on advanced chips, and Bitmain specialized in ASICs to meet these high-performance computing needs. To produce these chips, Bitmain relied heavily on foundries like TSMC, as well as packaging and testing services from Taiwanese companies such as Advanced Semiconductor Engineering (ASE).

Since its founding in 2013, Bitmain has consistently collaborated with TSMC, making the company its largest supplier over the years. Starting in 2015, Bitmain's steady growth led to an increase in its procurement from TSMC, rising from nearly 45% to almost 60% by 2018. When considering only its top five major suppliers, TSMC's share reached nearly 80%, underscoring Bitmain's deep reliance on TSMC's wafer fabrication technology.[8] (See Table 1) During this peak period, Bitmain became one of TSMC's top five customers, with industry reports suggesting that Bitmain's orders could utilize the entire monthly capacity of 20,000 wafers at TSMC's Nanjing facility.[9] In addition to TSMC, Bitmain also sourced wafers from GlobalFoundries, while its packaging and testing services were primarily provided by ASE and China's Jiangsu Changjiang Electronics Technology (JCET).

[7] Bitmain's 2018 IPO prospectus (Hong Kong Stock Exchange).

[8] Bitmain's 2018 IPO prospectus (Hong Kong Stock Exchange).

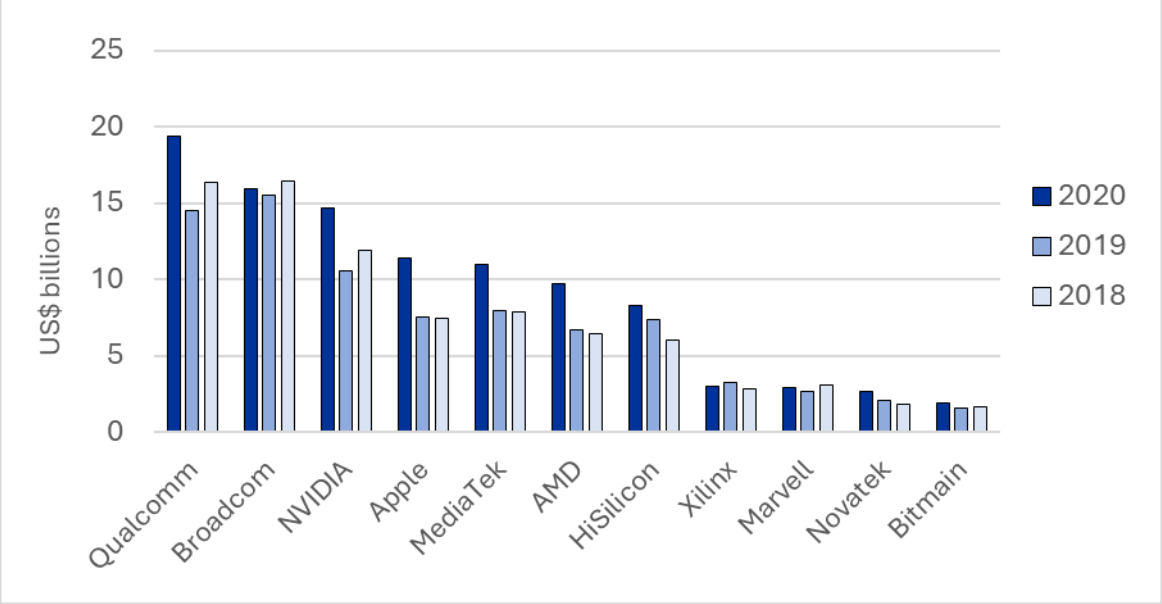
[9] Chen, Y.-C. (2018, March 30). Bitmain and NVIDIA Surge in Orders: TSMC's New and Existing Capacity Explodes This Year [比特大陸、NVIDIA 大追單　台積電今年新舊產能爆發]. Digitimes. Retrieved from https://www.digitimes.com.tw/tech/dt/n/shwnws.asp?CnlID=1&id=528434&query=%E6%AF%94%E7%89%B9%E5%A4%A7%E9%99%B8

Table 1 : TSMC's Share of Bitmain's Procurement Expenditure

Year	Share of Total Procurement Expenditure	Share of Top Five Suppliers' Total Procurement Expenditure
2015	44.8%	73.7%
2016	58.5%	79.5%
2017	58.6%	74.8%
2018 (till June)	59.2%	79.1%

Source: Bitmain's 2018 IPO prospectus (Hong Kong Stock Exchange).

Bitmain, a significant player in China's IC design industry, ranked third in revenue in 2020, trailing only HiSilicon and Unisoc. That year, Bitmain achieved an impressive 18.9% revenue growth, surpassing both of its competitors.[10] However, when compared to global IC leaders, Bitmain's impact is less pronounced. Its annual revenue is $833 million less than that of Taiwan's Novatek, which ranks 10th among global IC companies. (See Figure 3) The ASIC business model, which is highly specialized and does not cater to the general consumer market, limits Bitmain's sales scope and makes it challenging for the company to compete in revenue with the leading global firms.



Sources: Industrial Economics and Knowledge Center, Industrial Technology Research Institute (ITRI) & Trendforce.

Figure 3 : Bitmain vs. Global Top 10 Design Companies Revenue Comparison (2018-2020)

[10] Industrial Technology Research Institute, Industrial Economics and Knowledge Center. (2021). *2021 Semiconductor Industry Yearbook* [2021 半導體產業年鑑]. Taipei: Ministry of Economic Affairs, Department of Industrial Technology.

Two Key Figures: Micree Zhan and Jihan Wu

Despite being smaller than its international competitors, Bitmain's corporate structure is designed for the global market, with its cryptocurrency mining machines sold worldwide. In 2018, as Bitmain prepared for a potential listing on the Hong Kong Stock Exchange, the company underwent an internal restructuring. At the core of this structure was Bitmain Technologies Holding Company, based in the Cayman Islands. Above it were several entities in the British Virgin Islands, controlled by Bitmain's key figures, including co-founders Micree Zhan and Jihan Wu. (See Figure 4)

Micree Zhan and Jihan Wu were the largest shareholders, holding 36% and 20.25% stakes, respectively, and played crucial roles in the company's operations. They represented the company's expertise in semiconductor technology and cryptocurrency finance. Micree Zhan, who graduated from a local Chinese university with a major in Information and Communication Technologies, worked for six years at Beijing Unitend Technology Inc. (北京數字太和科技有限責任公司), a company with government ties that specializes in the R&D of telecommunications equipment like televisions and routers.[11] This company's business also includes chip design for related products.

Jihan Wu holds bachelor's degrees in finance and psychology from Peking University. He worked for three years as an investment manager at Beijing Shenshi Hongming Investment Fund Management Co., Ltd. (北京盛世宏明投資基金管理有限公司, Beijing Shenshi Hongming), a company that manages Chinese government industrial funds. For instance, in 2014, it managed the Beijing Integrated Circuit Industry Fund (北京市集成電路產業母基金). The company's mission is to enhance the efficiency of state capital investments in support of "strategic emerging industries" (國家戰略性新興產業) and "high-tech industry development" (高新技術產業發展).[12] In China's 12th Five-Year Plan, the semiconductor industry was identified as a strategic emerging industry, emphasizing the importance of domestic innovation for national strategy. The 13th Five-Year Plan continued this policy direction, with the State Council's "13th Five-Year Plan for National Strategic Emerging Industries Development" (「十三五」國家戰略性新興產業發展規劃) highlighting the strategic importance of the

[11] Baidu AIQicha. (n.d.). Beijing Unitend Technology Inc. [北京數字太和科技有限責任公司]. Retrieved from https://aiqicha.baidu.com/company_detail_28781001500621

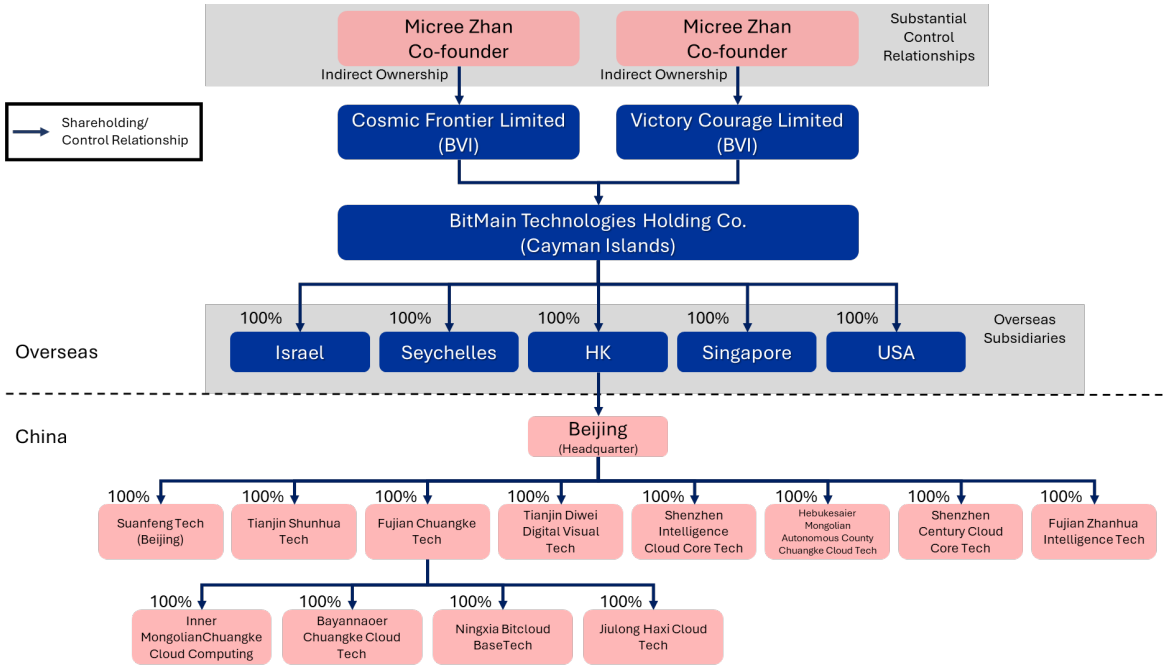
[12] Beijing Shenshi Hongming Investment Fund Management Co., Ltd. (n.d.). Company Profile [公司簡介]. Retrieved from http://www.cgpinvestment.com/index.php?m=content&c=index&a=lists&catid=8

semiconductor industry.[13] Clearly, Beijing Shenshi Hongming's operations closely align with Chinese government industrial policy.

An analysis of Bitmain's ownership structure reveals that, although it is not a state-owned enterprise, its funding background is closely linked to China's semiconductor industry strategy and the Chinese Communist Party (CCP). Under the leadership of Micree Zhan and Jihan Wu, Bitmain established subsidiaries in Israel, Seychelles, Hong Kong, Singapore, and the United States to manage overseas sales. The R&D headquarters in Beijing was a subsidiary under the Hong Kong entity, with branches in various Chinese provinces to expand domestic sales.

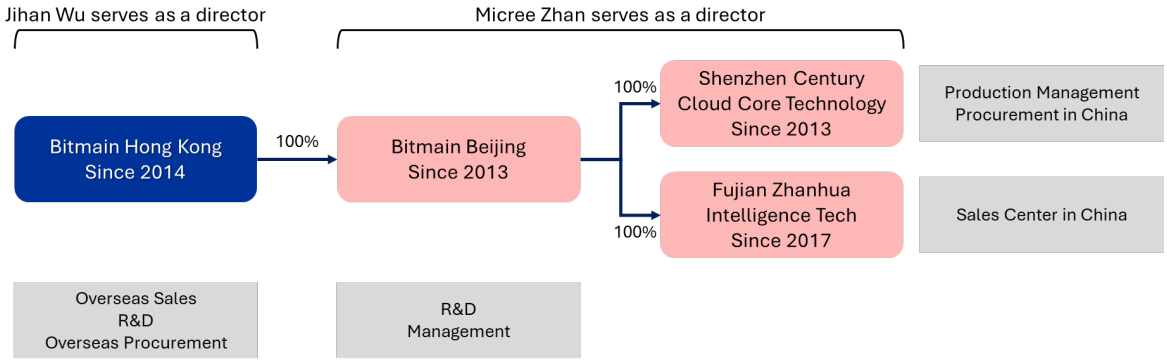
Figure 5 simplifies this complex structure, highlighting key operational units. The Hong Kong subsidiary oversaw overseas sales, procurement, and some R&D, while the Beijing headquarters handled R&D and production management. Jihan Wu focused more on international operations, serving as a director of the Hong Kong subsidiary. Meanwhile, Micree Zhan oversaw the Chinese market, acting as a director or representative of the Beijing headquarters and its subsidiaries, Shenzhen Century Cloud Core Technology (深圳市世紀雲芯科技) and Fujian Zhanhua Intelligent Technology (福建湛華智能科技). Shenzhen Century Cloud Core Technology managed domestic procurement, while Fujian Zhanhua Intelligent Technology handled sales within China.

[13] Central People's Government of the People's Republic of China. (2016, November 29). National 13th Five-Year Plan for the Development of Strategic Emerging Industries [国务院关于印发“十三五”国家战略性新兴产业发展规划的通知]. (Original CSET Translation). Retrieved from https://cset.georgetown.edu/research/national-13th-five-year-plan-for-the-development-of-strategic-emerging-industries/



Sources: Bitmain's 2018 IPO prospectus (Hong Kong Stock Exchange)

Figure 4 : Bitmain Company Structure (2018)



Sources: Bitmain's 2018 IPO prospectus (Hong Kong Stock Exchange)

Figure 5 : Bitmain's Key Subsidiaries and Main Business Responsibilities

Bitmain's AI Surveillance Collaboration with Chinese Local Governments

Given the division of responsibilities within Bitmain, Zhan managed the company's relationship with the Chinese government. In June 2018, Bitmain, represented by Zhan, signed a strategic cooperation agreement with the Fuzhou government and Fujian Electronics & Information Group (福建省電子信息集團). At the signing ceremony, Wang Ning, Deputy Secretary of the Fujian Provincial Party Committee, emphasized that Bitmain's investment in Fujian was in line with President Xi Jinping's policies, contributing to the development of China's IC design industry.[14]

Following this strategic agreement, Bitmain's collaboration with the Fujian provincial government deepened further. In January 2019, Bitmain, the Fuzhou government, and Fujian Domain Big Data Technology Co., Ltd. (福建省算域大數據科技有限公司) signed a memorandum of cooperation to develop AI chip technology for smart cities in Fuzhou.[15] AI chips, which Bitmain began developing after its success with cryptocurrency mining machines, have since become a significant focus for the company.

Bitmain started developing cloud AI chips in 2015, marking its entry into the AI sector. The company's first AI chip, the BM1680—branded as "Sophon"—was released in Q3 2017, using 28nm technology for image and facial recognition applications. In Q4 2018, Bitmain launched its second-generation AI chip, the BM1682, designed for broader commercial use. The BM1682's edge computing variant, the BM1880, also utilized 28nm technology but with lower power consumption, making it suitable for devices like cameras.[16] (See Table 2)

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[14] Fuzhou Municipal People's Government. (2018, June 28). Strategic Cooperation Agreement Signed between Fuzhou City and Beijing Bitmain Company Provincial Electronics Information Group [福州市與北京比特大陸公司 省電子信息集團簽訂戰略合作協議]. Retrieved from http://www.fuzhou.gov.cn/gzdt/rcyw/201806/t20180628_2473052.htm.

[15] Ai Jiwei. (2019, September 17). Bitmain Releases Third-Generation AI Chip, Micree Zhan Says Computing Power Equals Productivity [比特大陸發布第三代 AI 晶元 詹克團說算力就是生產力]. Ai Jiwei. Retrieved from https://www.laoyaoba.com/n/728944.

[16] Wen, S. (2020, November 25). Exclusive Interview with Bitmain AI Leader Jun Wang: Interpreting the Implementation of AI Chips and Smart Cities [独家对话比特大陆 AI 掌舵人王俊：解读 AI 芯片与智慧城市的落地经]. Zhidx. Retrieved from https://zhidx.com/p/245655.html

Table 2 : Bitmain AI Chip Products

Product Model	Product Type	Release Date	Process Node	Performance Description
BM 1680	Cloud AI Chip	Nov. 9, 2017	TSMC 28 nm	The first AI chip released was for pilot use and not mass-produced.
BM 1682	Cloud AI Chip	Oct. 17, 2018	TSMC 28 nm	The second-generation product had similar performance to the first but was produced for commercial use and in larger volumes.
BM 1880	Edge AI Chip	Oct. 17, 2018	TSMC 28 nm	The first product targeted for edge computing had low power consumption and was used in cameras.
BM 1684	Cloud AI Chip	Sep. 17, 2019	TSMC 12 nm	The third-generation chip increased computing power and reduced power consumption compared to the second generation.

Source: Bitmain's 2018 IPO prospectus (Hong Kong Stock Exchange).

Wen, S. (2020, November 25). Exclusive Interview with Bitmain AI Leader Jun Wang: Interpreting the Implementation of AI Chips and Smart Cities [独家对话比特大陆 AI 掌舵人王俊：解读 AI 芯片与智慧城市的落地经]. Zhidx. Retrieved from https://zhidx.com/p/245655.html

In September 2019, at the Fuzhou Urban Brain and Northeast Fujian Informatization Strategic Cooperation Conference (Fuzhou Conference), Micree Zhan unveiled Bitmain's third-generation AI chip, the BM1684. He claimed that this chip offered higher performance and lower power consumption, leveraging TSMC's 12nm process. Zhan emphasized that despite U.S. tech sanctions on Chinese companies like SMIC and Huawei, Bitmain's AI chips—driven by China's vast population data—could significantly boost productivity. He advocated for self-reliance in chip R&D as a countermeasure to U.S. sanctions.[17]

During the same event, Zhan announced the formation of the Fuzhou Urban Brain Industry Alliance and the Fuzhou Urban Brain Research Institute (福州城市大腦產業聯盟暨福州城市大腦研究院), intended to help the Fuzhou Big Data Development Committee establish policy standards. Bitmain led this alliance, with Huawei,

[17] Ai Jiwei. (2019, September 17). Bitmain Releases Third-Generation AI Chip: Jihan Wu Says Computing Power is Productivity [比特大陸發布第三代 AI 晶元 詹克團說算力就是生產力]. Ai Jiwei. Retrieved from https://www.laoyaoba.com/n/728944.

Hikvision, and Baidu serving as vice presidents. Notably, both Huawei and Hikvision are on the U.S. Entity List, with the U.S. government accusing Hikvision of contributing to human rights abuses in China and aiding the construction of a digital authoritarian system in Xinjiang.[18]

However, Bitmain did not release its fourth-generation AI chip in 2020 as Zhan had announced. Instead, in January 2020, the company faced significant layoffs, reportedly cutting more than 50% of its workforce, primarily from the AI chip division. This wave of layoffs highlighted the internal power struggle between Zhan and Jihan Wu. Wu opposed Zhan's aggressive expansion into AI chips, which had led to significant financial losses, and subsequently removed Zhan from all his positions at Bitmain. In response, Zhan publicly criticized Wu for making "suicidal mistakes."[19] After a series of disputes over corporate representation and awaiting regulatory decisions, the two parties reached a settlement in December 2020, with Zhan regaining control of Bitmain.[20]

Additionally, increased regulation of China's financial markets negatively impacted Bitmain's business. On September 24, 2021, the People's Bank of China issued a notice declaring cryptocurrency transactions illegal, forcing Bitmain to relocate all its mining operations outside of China.[21] Previously, Bitmain's mining farms were primarily located in Sichuan, Xinjiang, and Inner Mongolia. Following the ban, these operations were moved to North America, Europe, and Africa.[22] These setbacks also delayed Bitmain's plans to go public on the Hong Kong Stock Exchange, and the company has yet to successfully list.

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[18] China Daily. (2019, September 19). The Nation's First Self-Developed Open City Brain Starts Construction in Fuzhou [全國首個自主開放城市大腦在福州啟動建設]. China Daily. Retrieved from https://chuangxin.chinadaily.com.cn/a/201909/19/WS5d831bf4a31099ab995e0f08.html.

[19] Liberty Times. (2020, January 7). “Almost Suicide!”：Bitmain Announces Massive 50% Layoffs [『近乎自殺！』 比特大陸驚爆大裁員 50%]. Liberty Times. Retrieved from https://ec.ltn.com.tw/article/breakingnews/3032754.

[20] TechNews. (2021, January 28). The Internal Struggle Among Bitmain Founders Ends: Jihan Wu Leaves, Company Splits, Valuation Plummets [比特大陸創始人內鬥落幕：吳忌寒走人，公司分拆，估值大跌]. TechNews. Retrieved from https://technews.tw/?p=699849.

[21] People's Bank of China. (2021, September 24). Notice on Further Preventing and Dealing with the Risks of Virtual Currency Trading Speculation [關於進一步防範和處置虛擬貨币交易炒作風險的通知]. People's Bank of China. Retrieved from http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4348521/index.html.

[22] Asia Weekly. (2021, September 24). China Cracks Down on Cryptocurrency Companies: Bitmain Shifts Production Lines [中國封殺密幣企業逃亡　比特大陸生產線全面轉移]. Asia Weekly. Retrieved from https://reurl.cc/WrNA17.

Remote Poaching of Taiwan's AI Chip R&D Team

Bitmain's Development of Edge AI and Initial Rounds of Financing

Bitmain's AI chip development, particularly for edge AI chips, progressed through a new business mechanism. At the Fuzhou Conference, Micree Zhan announced that Bitmain's AI chip business would be spun off into a separate company.[23] While the first to third-generation products were cloud AI chips designed for centralized data processing on cloud servers, the upcoming edge AI chips—developed by the newly established Beijing Jingshi Intelligent Technology Co., Ltd. (北京晶視智能科技有限公司, Beijing Jingshi)—would perform computations directly on the device, eliminating the need for a connection to cloud servers. The R&D team responsible for developing facial recognition AI chips at Beijing Jingshi was entirely composed of Taiwanese engineers working in Taiwan.[24]

At the same conference, Beijing Jingshi signed an investment agreement with Beijing Zhiyun City Investment Fund (北京智慧雲城投資基金, Beijing Zhiyun), which pledged financial support. This fund was co-founded by Beijing E-hualu Information Technology Co., Ltd. (北京易華錄信息技術股份有限公司, Beijing E-hualu) and Leading Capital (力鼎資本). Leading Capital, established in Beijing in 2007, frequently collaborates with Chinese government industrial funds. Beijing E-hualu, directly supervised by the State-owned Assets Supervision and Administration Commission (SASAC), is a central state-owned enterprise.[25] Yongjun Lin, representing Beijing E-hualu, integrated this investment into the company's "Data Lake+" (數據湖 +) strategy, aimed at accelerating the digital transformation of government governance and fostering local technology firms to meet China's cybersecurity goals outlined in the

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[23] Ai Jiwei. (2019, September 18). Bitmain Spins Off Edge AI Chip Business: Cvitek Accelerates Deployment [比特大陸分拆端側 AI 晶元業務 晶視科技加快佈局]. Ai Jiwei. Retrieved from https://www.laoyaoba.com/n/729086.

[24] Personal communication, Mar 26, 2022: Manager Chen, a former senior executive at a Taiwanese IC design company, is knowledgeable about certain aspects of the investigation conducted by Taiwanese authorities into Bitmain.

[25] Leading Capital. (n.d.). About Us [關於我們]. Leading Capital. Retrieved from http://www.leadingcapital.com.cn/about. Beijing E-hualu Information Technology Co., Ltd. (n.d.). Company Profile [公司簡介]. Beijing E-hualu Information Technology Co., Ltd. Retrieved from https://www.ehualu.com/about_32.html#companyHistory.

14th Five-Year Plan. Beijing Jingshi was identified as a key development target.[26] The signing of the investment agreement, witnessed by Yongjun Lin and Micree Zhan, marked the beginning of crucial financial backing from Bitmain, Beijing E-hualu, and Leading Capital for Beijing Jingshi's operations.[27]

Beijing Jingshi was officially registered in May 2019, with significant investments following in September, December, and January of the following year. In September, Bitmain, under the name Beijing Si Nian Mainland Technology Center (北京斯年大陸科技中心), invested in Beijing Jingshi. In December, Yongjun Lin, through Beijing Zhiyun, and in January 2020, together with Jiaxing Leading Songying Equity Shares Investment Management Co., Ltd. (嘉興力鼎松盈股權投資合夥企業), also contributed investments to Beijing Jingshi.

After the first round of financing, Xiaomi Group became the target of the second round. In January 2021, Xiaomi Group's private equity fund, Hubei Xiaomi Changjiang Industrial Fund Management Co., Ltd. (湖北小米長江產業基金合夥企業), acquired a 20.7% stake in Beijing Jingshi.

Before these two rounds of financing, another corporate shareholder existed when Beijing Jingshi was initially established: Shenzhen Jingding Enterprise Management Co., Ltd. (深圳市晶鼎企業管理合夥企業). Its shareholder, Haitao Suo, invested only 500 RMB, making it appear as a shell company. By August 2019, Beijing Jingshi and Shenzhen Jingding Enterprise Management Co., Ltd. began restructuring their equity, establishing Beijing Jingshi's initial operational framework.

[26] Beijing E-hualu Information Technology Co., Ltd. (n.d.). Successful Conclusion of the Third Data Lake Conference in 2021 [易華錄 2021 第三屆數據湖大會圓滿舉行]. Beijing E-hualu Information Technology Co., Ltd. Retrieved from https://www.ehualu.com/newsInfo_2959.html.

[27] Ai Jiwei. (2019, September 18). Bitmain Spins Off Edge AI Chip Business: Cvitek Accelerates Deployment [比特大陸分拆端側 AI 晶元業務 晶視科技加快佈局]. Ai Jiwei. Retrieved from https://www.laoyaoba.com/n/729086.

Taiwanese engineers Jen-Shi Wu and Hsi-Kang Tsao, along with Chinese national Lei Wang, became core members of Beijing Jingshi, with Lei Wang serving as the company's legal representative. Jen-Shi Wu and Hsi-Kang Tsao were later investigated, searched, and prosecuted by NTCPO. Jen-Shi Wu, who holds a Ph.D. in Electrical Engineering from National Taiwan University, previously served as Vice President of R&D at MStar Semiconductor until its acquisition by MediaTek in 2012.

Jen-Shi Wu acquired a minority stake in Beijing Jingshi. Moreover, his Hong Kong-based company, Crystal Vision Technology Co., Ltd. (Cvitek HK), also invested in Beijing Jingshi in August 2019, holding approximately 17.3% of shares after subsequent rounds of financing. Cvitek HK was registered in March 2019 with a capital of 1 HKD, with Jen-Shi Wu as the representative. After minor changes in the board of directors, Lei Wang succeeded as a director in May and resigned in July, with Hsi-Kang Tsao taking over in July.

Jen-Shi Wu and Hsi-Kang Tsao also established Shenzhen Jingxi Holdings Management Co., Ltd. (深圳市晶曦控股合夥企業), which, together with Lei Wang, invested in Shenzhen Jingding Enterprise Management Co., Ltd., the initial corporate shareholder of Beijing Jingshi.

Lei Wang, one of the key figures, is a Chinese engineer with a Master's in Electronic Engineering from Tsinghua University, China. He was Bitmain's former software director responsible for AI chip development and worked on mobile chip design at RDA Microelectronics under Tsinghua Unigroup. He also developed camera software architecture for Da-Jiang Innovations (DJI).[28] Lei Wang also collaborated with Jihan Wu to establish Shenzhen Sangu Enterprise Management Co., Ltd. (深圳算谷企業管理合夥企業), investing in Beijing Jingshi.

Table 3 details the corporate shareholders of Beijing Jingshi, their investment stages, substantial control relationships, and their associations with Jen-Shi Wu, Hsi-Kang Tsao, Lei Wang, and Jihan Wu.

[28] Jingshi Intelligent (Company Code: 500005). (2022, February 25). Beijing Fourth Board Market [北京四板市場]. Retrieved from https://www.bjotc.cn/content/details_187_1138261.html.

Table 3 : Investors and Actual Control Relationships at Various Stages of Beijing Jingshi (Before March 2021)

Date of Equity Change	Nominal Investor	Actual Controller / Related Person	Actual Controller / Related Person
2019.05.07 (Establishment of Beijing Jingshi)	Shenzhen Jingding Enterprise Management Co., Ltd. (Limited Partnership)	Jen-Shi Wu, Lei Wang, Hsi-Kang Tsao	Originally established by Haitao Suo with an investment of 500 RMB. In August 2019, Lei Wang invested about 1 million RMB, and in September, Shenzhen Jingxi Holdings Management Co., Ltd. (Limited Partnership) invested nearly 4 million RMB (or equivalent value in technology), becoming the largest shareholder. Shenzhen Jingxi Holdings Management Co., Ltd. (Limited Partnership) was jointly funded by Jen-Shi Wu and Hsi-Kang Tsao.
2019.08.13	Jen-Shi Wu	Himself	
	Hsi-Kang Tsao	Himself	
	Ningbo Meishan Free Trade Port Zone Zhongwei Dingxin Asset Management Co., Ltd. (寧波梅山保稅港區中維鼎信資產管理有限公司)	Yu Zhang	Yu Zhang is the actual controller of Ningbo Meishan Free Trade Port Zone Zhongwei Dingxin Asset Management Co., Ltd. Yu Zhang is also the representative of Shanghai Sizhong Technology Co., Ltd., with Micree Zhan as the director. Shanghai Sizhong Technology Co., Ltd. engages in AI technology development.
	Crystal Vision Technology Co., Ltd. (Hong Kong)	Jen-Shi Wu	A company established by Jen-Shi Wu in Hong Kong.

Date of Equity Change	Nominal Investor	Actual Controller / Related Person	Actual Controller / Related Person
	Shenzhen Sangu Enterprise Management Co., Ltd. (Limited Partnership)	Micree Zhan, Lei Wang	A company jointly established by Micree Zhan and Lei Wang, with Micree Zhan as the representative.
2019.09.05	Beijing Si Nian Mainland Technology Center (Limited Partnership)	Bitmain	The largest shareholder is Beijing Bitmain Technology Co., Ltd., represented by Micree Zhan.
2019.12.03	Beijing Zhiyun City Investment Fund (Limited Partnership)	State Council of China	Beijing Zhiyun City Investment Fund (Limited Partnership) was co-founded by Beijing E-hualu Information Technology Co., Ltd. and Leading Capital. The investment agreement was signed with Beijing Jingshi by Yongjun Lin, the representative of Beijing E-hualu. Beijing E-hualu is a state-owned central enterprise directly supervised by the SASAC.
2020.09.07	Jiaxing Leading Songying Equity Shares Investment Management Co., Ltd. (Limited Partnership)	Chaoyang Wu/Beijing E-hualu	The manager of Jiaxing Leading Songying Equity Shares Investment Management Co., Ltd. (Limited Partnership) is Shenzhen Leading Capital Management Co., Ltd. (深圳市力鼎基金管理有限責任公司) The actual controller of Shenzhen Leading Capital Management Co., Ltd. is Chaoyang Wu, who was a director of Beijing E-hualu Leading Investment

Date of Equity Change	Nominal Investor	Actual Controller / Related Person	Actual Controller / Related Person
			Management Co., Ltd. before October 2019. Beijing E-hualu Leading Investment Management Co., Ltd. is the representative of Beijing Zhiyun City Investment Fund (Limited Partnership).
2021.01.15	Hubei Xiaomi Changjiang Industrial Fund Management Co., Ltd. (Limited Partnership)	Xiaomi Group	Hubei Xiaomi Changjiang Industrial Fund Management Co., Ltd. (Limited Partnership) is a private equity fund controlled by Lei Jun, CEO of Xiaomi Group.

Source:

Beijing Jingshi Intelligent Technology Co., Ltd. (n.d.). Qixinbao. Retrieved from https://www.qixin.com/company/4a23ca2e-6c90-4d1c-a144-07472163753e.

Beijing Zhiyun City Investment Fund Center (Limited Partnership) [北京智慧雲城投資基金中心（有限合夥）]. (n.d.). Qixinbao. Retrieved from https://www.qxbao.com/c/4d32e5a3-7c53-4e66-a424-9bdeabaa8e90.

Hong Kong Companies Registry.

Jiaxing Leading Songying Equity Investment Partnership (Limited Partnership) [嘉興力鼎松盈股權投資合夥企業（有限合夥）]. (n.d.). Asset Management Association of China. Retrieved from https://gs.amac.org.cn/amac-infodisc/res/pof/fund/2007151714102795.html.

*Ningbo Meishan Free Trade Port Zone Zhongwei Dingxin Asset Management Co., Ltd. [寧波梅山保稅港區中維鼎信資產管理有限公司]. (n.d.). Aiqicha. Retrieved from https://aiqicha.baidu.com/detail/compinfo?pid=xlTM-TogKuTw7X*TIT8PZu4H54id36kEkwmd&rq=es&pd=ee&from=ps.*

Securities Times Network. (2021, December 16). Lei Jun Enters Private Equity! His Company Just Completed Filing [雷軍進軍私募！旗下公司剛完成備案]. Securities Times Network. Retrieved from https://www.stcn.com/xw/sd/202112/t20211216_3976368.html.

Shenzhen Jingding Enterprise Management Partnership (Limited Partnership) [深圳市晶鼎企業管理合夥企業（有限合夥）]. (n.d.). Qixinbao. Retrieved from https://www.qixin.com/company/7d8caa24-c639-43aa-90ff-3f6e971a13c2.

Shenzhen Jingxi Holdings Partnership (Limited Partnership) [深圳市晶曦控股合夥企業（有限合夥）]. (n.d.). Qixinbao. Retrieved from https://m.qixin.com/company/b186147f-d317-411e-94b3-0ed83c1576a4.

Shenzhen Leading Fund Management Co., Ltd. [深圳市力鼎基金管理有限責任公司]. (n.d.). Asset Management Association of China. Retrieved from https://gs.amac.org.cn/amac-infodisc/res/pof/manager/101000022130.html. (Accessed on May 10, 2022).

Shenzhen Sangu Enterprise Management Partnership (Limited Partnership) [深圳市算谷企業管理合夥企業（有限合夥）]. (n.d.). Qixinbao. Retrieved from https://m.qixin.com/company/2c1384c9-80b6-461d-a729-e0f7db5907ea.

Shanghai Sizhong Technology Co., Ltd. [上海鍶鐘科技有限公司]. (n.d.). Aiqicha. Retrieved from https://aiqicha.baidu.com/company_detail_31567143679459.

Sina Technology. (2021, April 25). Micree Zhan Serves as Legal Representative for Bitmain Affiliates [詹克團擔任比特大陸關聯公司法定代表人]. Sina Finance. Retrieved from https://finance.sina.com.cn/tech/2021-04-25/doc-ikmyaawc1713124.shtml.

Taiwanese Engineers' Technical Investment via Hong Kong

From the establishment of Beijing Jingshi in May 2019 to the equity restructuring in August and subsequent two rounds of financing, the actual control relationships behind Beijing Jingshi can be divided into two main groups: Taiwanese technical engineer network and Chinese financing network.

Beijing Jingshi's shareholding structure is primarily divided between Jen-Shi Wu and Micree Zhan, each leading a different equity system. Jen-Shi Wu's system includes investments from Hsi-Kang Tsao and some contributions from Lei Wang. In contrast, Micree Zhan's system involves significant funding rounds from Bitmain and Beijing E-hualu, along with a corporate shareholder co-founded by Zhan and Wang.

Although there seem to be no public records linking Xiaomi Group's investment directly to Micree Zhan, the investment follows a similar pattern to other cases in Zhan's network, given its Chinese origin and substantial private equity funding. Additionally, Beijing Jingshi's corporate shareholders include Ningbo Meishan Free Trade Port Zone Zhongwei Dingxin Asset Management Co., Ltd., controlled by Yu Zhang, who co-founded Shanghai Sizhong Technology Co., Ltd. (上海鍶鐘科技有限公司) with Zhan.

Analyzing Beijing Jingshi's shareholding structure, Jen-Shi Wu's Hong Kong-based company, Cvitek HK, played a crucial role by providing a technical investment that brought valuable image recognition AI chip technology from Taiwanese engineers to Beijing Jingshi.[29] In this collaboration, Taiwanese engineer Jen-Shi Wu provided the technological expertise, while Chinese national Micree Zhan secured the financing

[29] Personal communication, Mar 26, 2022: Manager Chen.

opportunities. This synergy between Taiwanese technology and Chinese funding enabled Beijing Jingshi to operate and develop its AI chip products. Lei Wang, the legal representative of Beijing Jingshi, brought his background in IC design and played a significant role in the partnership with both major operators. He co-established investment funds and holds shares in Beijing Jingshi accordingly. (See Table 4)

Table 4 : Two Main Roles in Beijing Jingshi's Shareholding Structure (Before March 2021)

Year	Share of Total Procurement Expenditure	Share of Top Five Suppliers' Total Procurement Expenditure
Nationality	Taiwan	China
Role	Provide Technology	Secure Funding
Related Individual or Corporate Shareholders (percentage of equity)[30]	■ Shenzhen Jingding Enterprise Management Co., Ltd. (8.16%) ■ Crystal Vision Technology Co., Ltd. (HK) (17.3%) ■ Jen-Shi Wu (3%) ■ Hsi-Kang Tsao (2.4%)	■ Ningbo Meishan Free Trade Port Zone Zhongwei Dingxin Asset Management Co., Ltd. (0.48%) ■ Shenzhen Sangu Enterprise Management Co., Ltd. (5.41%) ■ Beijing Si Nian Mainland Technology Center (20%) ■ Beijing Zhiyun City Investment Fund Center (15.02%) ■ Jiaxing Leading Songying Equity Shares Investment Management Co., Ltd. (7.51%) ■ Hubei Xiaomi Changjiang Industrial Fund Management Co., Ltd. (20.72%)
Total Shareholding Percentage	30.86%	69.14%
Semiconductor Industry Background	MediaTek, MStar Semiconductor	Bitmain

Source: Compiled by the author.

[30] Kuaikeji [快科技]. (2021, February 3). Xiaomi Acquires Shares in Chip Developer Jingxi Intelligent: Becomes Largest Shareholder [小米入股晶元研發商晶視智能：成為第一大股東]. Retrieved from https://news.mydrivers.com/1/738/738588.htm.
Qixinbao [啟信寶]. (2021, June 28). Annual Report 2020 of Beijing Jingshi Intelligent Technology Co., Ltd. [北京晶視智能科技有限公司 - 2020 年度報告]. Retrieved from https://www.qixin.com/report/4a23ca2e-6c90-4d1c-a144-07472163753e/2020.

Behind the Financial Partnership: Poached by China Without Relocation

During the Taiwanese authorities' investigation, besides Jen-Shi Wu and Hsi-Kang Tsao, two other defendants were identified: Chih-Hui Huang and Chin-Chung Yen. Huang was the chairman of IC Link Limited Company (芯道互聯) and the designated corporate representative of Topspot Technologies Limited, a Seychelles company, which solely funded IC Link.[31] The company was established in July 2017. Yen was the chairman and sole investor of WiseCore Technology Co., Ltd. (智鈊科技), established in August 2018.[32] The NTCPO concluded that IC Link and WiseCore Tech engaged in business activities in Taiwan, such as talent recruitment, without proper approval from the Department of Investment Review. These companies placed chip manufacturing orders with TSMC and outsourced packaging and testing to ASE Technology under the names of Beijing Jingshi and Cvitek HK.[33]

Bitmain's business model involved completing IC design in China and placing manufacturing orders with Taiwanese semiconductor companies to obtain the final product. Although government registration records show that Bitmain and Beijing Jingshi did not directly invest in or establish companies in Taiwan, they successfully operated through IC Link and WiseCore Tech. IC Link, funded by Topspot Technologies, was likely financially backed by Bitmain, while WiseCore Tech was established to employ Taiwanese engineers who collaborated with Beijing Jingshi. IC Link's sole shareholder, Topspot Technologies Limited (Seychelles), likely received funding from Bitmain, while WiseCore Tech's capital of 4 million NTD likely came from the Taiwanese R&D team. [34]

After leaving MediaTek in December 2017, Jen-Shi Wu joined IC Link. When Cvitek HK and Beijing Jingshi were being established, Wu left IC Link to head WiseCore Tech, leading the engineering team in Taiwan and providing design services for Beijing Jingshi.

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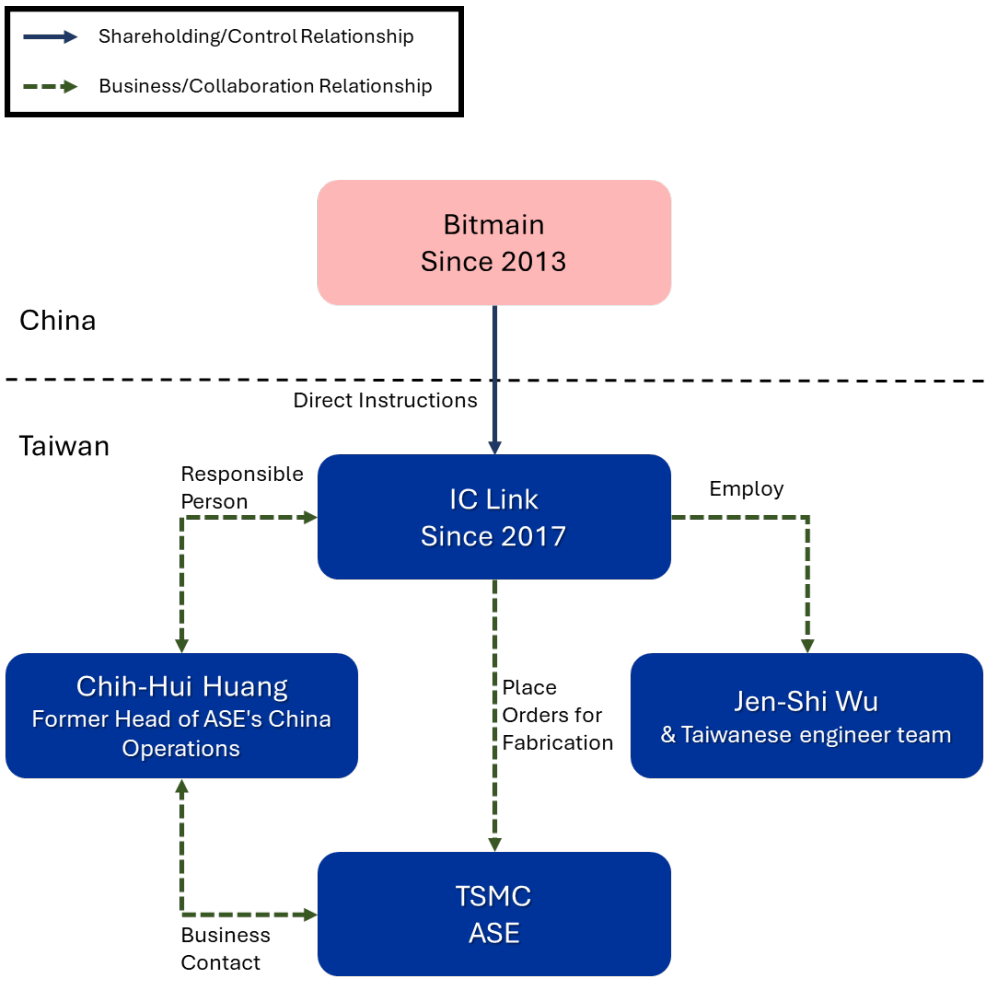
[31] Administration of Commerce, Ministry of Economic Affairs [經濟部商業司商工登記公示資料]. (n.d.). IC Link Limited Company [芯道互聯有限公司]. Retrieved from https://findbiz.nat.gov.tw/fts/query/QueryBar/queryInit.do?banNo=56706824.

[32] Administration of Commerce, Ministry of Economic Affairs [經濟部商業司商工登記公示資料]. (n.d.). WiseCore Technology Co., Ltd. [智鈊科技有限公司]. Retrieved from https://findbiz.nat.gov.tw/fts/query/QueryBar/queryInit.do?banNo=50865697.

[33] New Taipei City District Prosecutors Office [臺灣新北地方檢察署]. (2021, August 23). Investigation of WiseCore and IC Link for Violations of the Act Governing Relations between the People of the Taiwan Area and the Mainland Area Concluded with Deferred Prosecution [新北地檢署偵辦智〇、芯〇公司違反臺灣地區與大陸地區人民關係條例案件，業經偵查終結，為緩起訴處分].

[34] Personal communication, Mar 26, 2022: Manager Chen.

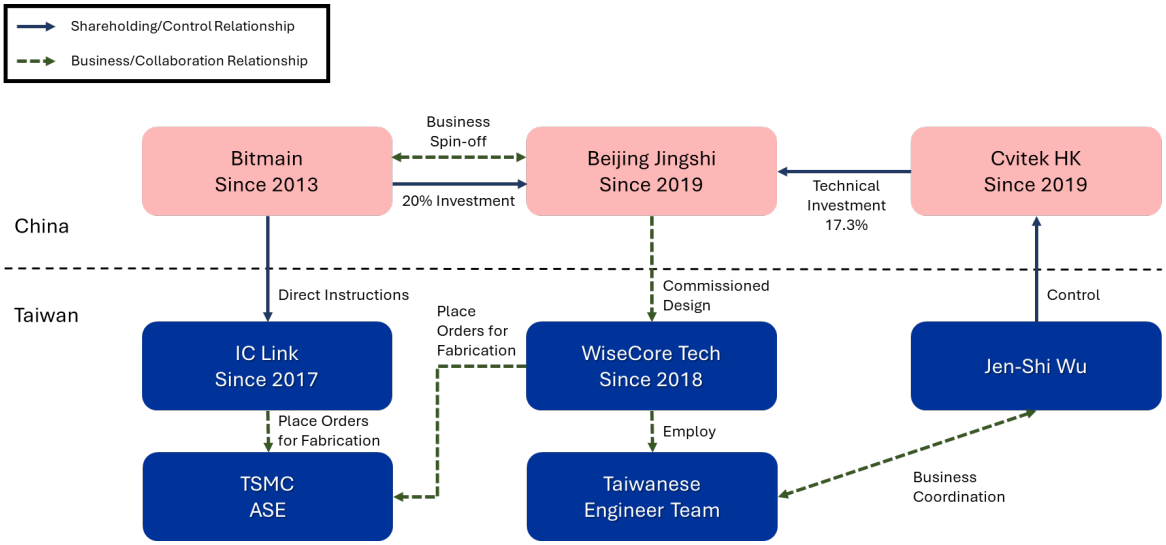
Chih-Hui Huang, previously head of ASE's China operations, became head of IC Link and likely facilitated long-term business relations between Bitmain and ASE.[35] Figure 6 illustrates the business relationship before Bitmain spun off its AI chip business, with Wu and Huang employed by IC Link and Bitmain collaborating with TSMC and ASE through IC Link. Figure 7 shows the business relationship after Bitmain's edge AI chip business was spun off to Beijing Jingshi, with WiseCore Tech in Taiwan, led by Wu, providing design services for Beijing Jingshi. Legally, IC Link and WiseCore Tech were independent with no direct business connections. However, from a strategic perspective, both played crucial roles in talent acquisition and maintaining relationships with Taiwanese companies for Bitmain.



Sources: Compiled by the author.

Figure 6 : Before the Spin-off: Cooperation with IC Link

[35] Chip Insights [芯智訊]. (2018, June 29). MediaTek Issues Warning After Bitmain's Aggressive Poaching [遭遇比特大陸瘋狂挖人，聯發科忍無可忍發函警告]. Retrieved from http://www.icsmart.cn/19976/.



Sources: Compiled by the author.

Figure 7 : After the Spin-off: Cooperation with the Taiwan Base

The Impact of Taiwanese Investigative Actions

In March 2021, Taiwanese authorities initiated an investigation that concluded in August. Although the four defendants did not face criminal charges, WiseCore Tech dissolved in March 2022. In January 2022, Beijing Jingshi underwent a significant change in ownership, with Lei Wang being replaced by Hongai Zhao as the legal representative. Zhao also served as the legal representative for Bitmain's affiliates, Sophon Technologies Ltd. (算豐科技有限公司) and Shenzhen Intelligence Cloudic Technology Co., Ltd. (深圳市智能雲芯科技有限公司)[36] During the leadership struggle at Bitmain between Micree Zhan and Jihan Wu, Wu accused Zhan of making poor personnel decisions, specifically citing Zhao's role in creating dissatisfaction among employees.[37] Zhao's appointment and the subsequent capital increase at Beijing Jingshi raised Bitmain's share from 20% to 32.14%, making it the largest shareholder.

The dissolution of WiseCore Tech effectively severed Beijing Jingshi's access to Taiwanese AI chip technology. In July 2020, Beijing Jingshi launched a new CV-series

[36] Beijing Fourth Board Market [北京四板市場]. (2022, February 25). Cvitek Beijing (Company Code: 500005) [晶視智能（企業代碼：500005）]. Retrieved from https://www.bjotc.cn/content/details_187_1138261.html. Tianyancha [天眼查]. (n.d.). Shenzhen Intelligence Cloudic Technology Co., Ltd. [深圳市智能雲芯科技有限公司]. Retrieved from https://webcache.googleusercontent.com/search?q=cache:zCk6jchurc8J:https://www.tianyancha.com/company/3133616766+&cd=1&hl=zh-TW&ct=clnk&gl=tw.

[37] Gyro Technology [陀螺科技]. (2020, January 8). Jihan Wu: Micree Zhan Enjoys Flattery, Leading to Chaos [吳忌寒：詹克團喜歡被拍馬屁，下麵人霍亂朝綱]. Retrieved from https://www.tuoluo.cn/article/detail-6139085.html.

edge AI chip for surveillance, building on Bitmain's BM1880 chip technology. New versions released in November 2020 and 2021 claimed improved performance and aimed to expand into the consumer market.[38]

Taiwanese legal actions decisively cut the link between Beijing Jingshi and WiseCore Tech, preventing Bitmain from further acquiring technology from Taiwanese engineers. Unlike traditional investment review mechanisms, Taiwan used criminal investigations to address Bitmain's remote poaching activities. Taiwan's economic security framework heavily relies on investment review processes, which distinguish between Chinese and other foreign investments, with stricter criteria and scrutiny for Chinese capital under the Act Governing Relations between the People of the Taiwan Area and the Mainland Area (Cross-Strait Act).

The investigation into Bitmain's activities in Taiwan supplemented this framework. Chinese companies that circumvent investment rules without Taiwanese government approval face criminal liabilities under Article 40-1 of the Cross-Strait Act. After the disconnection between Beijing Jingshi and WiseCore Tech, Beijing Jingshi's chip products were integrated into another Bitmain affiliate, SOPHGO (算能科技), in 2022.[39]

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[38] Beijing Jingshi Official Website [北京晶視智能]. (2020, July 15). Beijing Jingshi Launches New Generation of High-Performance Machine Vision Chips [晶視智能重磅推出本公司新一代高效能機器視覺晶片]. Retrieved from http://www.cvitek.com/News_20200715.
Beijing Jingshi Official Website [北京晶視智能]. (2020, November 2). Beijing Jingshi Launches 4K Vision Processing Chips, Providing Comprehensive Smart Camera Chip Solutions [晶視智能推出 4K 視覺處理晶片，提供完整智慧攝像頭晶片方案]. Retrieved from http://www.cvitek.com/News_20201102.
Beijing Jingshi Official Website [北京晶視智能]. (2021, December 17). Beijing Jingshi Participates in the First China RISC-V Industry Forum at Dishui Lake [北京晶視智能科技參加 2021 首屆滴水湖中國 RISC-V 產業論壇]. Retrieved from http://www.cvitek.com/News_20211201.

[39] SOPHGO Official Website [算能科技]. (n.d.). About SOPHGO [关于算能]. Retrieved from https://www.sophgo.com/about-us/index.html.

Key Implications for Taiwan's Economic Security

Cross-Strait Capital and Technology Collaboration through the "Remote Poaching" Model

Bitmain has consistently emphasized the independent development of its chip products, from cryptocurrency mining machines to facial recognition AI chips, investing heavily in enhancing computational performance to compete in the global semiconductor market. However, when it comes to edge AI chip technology, Bitmain relies significantly on Taiwan's semiconductor industry, from design and manufacturing to packaging and testing. Taiwanese engineers at WiseCore Tech design the chips, which are then manufactured and tested by TSMC and ASE before being sent back to Bitmain for branding and sales. Although these engineers remain in Taiwan, they effectively function as remote employees for Bitmain, highlighting a "remote poaching" model where Taiwanese talent is utilized by Chinese companies without physical relocation. This model serves as a prototype for analyzing other cases of Chinese poaching within Taiwan's semiconductor industry and could be a reference for the global IC design industry in addressing Chinese technological acquisition efforts.

Beijing Jingshi plays a crucial role as the recipient of Bitmain's spun-off AI chip business. Despite being based in China and funded by Bitmain, Taiwanese R&D teams hold a significant share of its equity, maintaining a partnership with Bitmain. Under the leadership of Micree Zhan, Bitmain continues to collaborate with Chinese authorities, aligning its semiconductor business with China's policy of developing independent chip technology. China's semiconductor policy aims to reduce reliance on U.S. technology, reflecting the broader structural trends of the U.S.-China tech rivalry. The connections between Bitmain, Beijing Jingshi, and WiseCore Tech underscore Taiwan's pivotal role in this global competition.

Effectiveness of Taiwanese Investigative Actions and Potential Legal Loopholes

Taiwanese authorities have emphasized the importance of protecting Taiwan's semiconductor technology from external transfer during their investigations. However, the legal basis for the investigation centered not on the semiconductor technology itself but on Bitmain's failure to follow investment review procedures and obtain the necessary permissions from the Taiwanese government to invest and operate in Taiwan. While this legal approach effectively severed the business ties between Bitmain and Taiwanese engineering teams, it raises questions about which specific home-grown semiconductor technologies should be protected and how unauthorized use by China could harm Taiwan's national interests.

Examining the "remote poaching" model, it becomes evident that Bitmain used Chinese funding to acquire Taiwanese R&D expertise and advanced wafer manufacturing technologies. Chinese capital did not enter Taiwan directly, nor did Taiwanese engineers relocate to China, yet the technology transfer occurred, aiding China's efforts toward semiconductor self-sufficiency. This scenario highlights the need for Taiwan to consider regulating such business practices, as China's drive for semiconductor independence could undermine Taiwan's competitive edge in the industry.

In a hypothetical scenario, if WiseCore Tech acted as a chip design service provider, completing AI chip designs and manufacturing orders before selling the finished products to Beijing Jingshi and Bitmain, it would not violate the law. However, this approach would still enhance China's semiconductor self-sufficiency. The inconsistency in Taiwan's legal logic—banning the former but allowing the latter—could harm Taiwan's national interests and weaken its ability to manage supply chain risks in the geopolitical landscape of US-China tech rivalry.