

# Science Park Must Be Defended: Taiwan's Solution in the State of Emergency

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Sound epidemic management in Taiwan ensured the Hsinchu Science Park (HSP)'s considerable growth in 2020. The island had few infection cases, and its social order seemed not that different than before. However, the following year is much more challenging. During May and June of 2021, there were severe drought and the domestic outbreak of the Covid-19 virus variant. In such an emergency, the dominance of the Science Park over the local resource became more pronounced. The government played vital roles, acting as a distributor and mediator to solve the water shortage problem and implementing an industrial-oriented water resource allocation centered on the HSP. Meanwhile, influential high-tech firms provided the state with complementary (or competitive) governance by negotiating diplomatic issues, such as purchasing the BioNTech vaccines. In reflection on the political theory of corporate governance that asserts the "socialized property" nature of the corporate, this article aims to figure out the particularity of influential high-tech corporate governance in the current situation of Taiwan.

*Keywords: Hsinchu Science Park, Taiwan, Corporate Governance, Resource Distribution, Taiwan Semiconductor Manufacturing Company*

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Signs of an unusual drought appeared in Taiwan as early as the fall of 2020. It was the first time over the past half-century that Taiwan had not been hit by any typhoon. Nestling against the western shoreline of the Pacific Ocean, the island's water resource mainly relies on the annual typhoon and the rain season.

A drizzling afternoon this summer, when the rain that had been absent for a long time eventually dropped onto the land, a friend invited me for a short trip to the nearby reservoir. Passing through the broad concrete roads between enormous factory buildings, the car then climbed the narrow path inside the mountain. After fifteen minutes of driving, we saw some newly built apartments on the hillside. Those real estate apartments with dense windows and balconies looked more like dormitories. As we drove higher, we saw a couple of cozy villas. Two dogs ran to the car, while another three dogs stood not far away, barking at us. We were approaching the reservoir.

It was not like a reservoir view; it seemed more like a hole in the ground. Thankfully, we already had dim anticipation in mind. These days media were reporting a lot about the worrying emptiness of this reservoir. In the two reservoirs in Baoshan county of Hsinchu, the water level dropped off to less than 10% of the total pondage. Stones lay in the bottom, while most of the red gauge column was exposed beyond the water.

A few visitors came here too. People were excited about the rain yet somehow disappointed about the scene. They were talking about the stock price of the nearby technical firms. Such drizzles could not contribute much to the thirsty reservoir. If the drought continues, it might impact the value of the Taiwanese high-tech firms on the American stock market.

The Hsinchu Science Park (HSP) faced a severe precarious domestic infrastructure on water supply this spring. Its main products, semiconductors and optoelectronics displays, require massive consumption of pure water in the process of cleaning and etching. The reservoir's water level in front of us was vital to a worldwide market of electronics, motors, and information technology industry. Economically speaking, it was indeed a state of emergency.

### **The Dominating Science Park**

International media described Taiwan as the most "important" and "dangerous" place in the world (The New York Times 2020, The Economist 2021a), not only because of Taiwan's geopolitical position between the current antagonistic superpowers, the United States and China, but also the chip-power that Taiwan owns in today's global high-tech supply chain. The HSP is considered one of the most successful industrial zones, as it has fostered the semiconductor giant Taiwan Semiconductor Manufacturing Company (TSMC) and various top-ranking IC suppliers in the past forty years.

The breakout of Covid-19 made the HSP more visible to the entire world. Opposite to the pervasive economic slowdown in most countries due to the epidemic, Taiwan benefited a lot from climbing sales of Science Park firms. When the global production capacity declined, whereas the needs for long-distance working and learning increased, orders for the HSP's electronic products rose rapidly. The HSP's revenue in 2020 has reached 42 billion US dollars, which occupies nearly 9% of Taiwan's total manufacturing output (HSPB 2021). Not to mention that TSMC dominates 84% of the global chip market (The Economist 2021b). The company's advanced technology on semiconductors once intensified the 2019 US-China Trade War as the former US President Donald Trump released a strict ban on Chinese smartphone makers, and now it even controls the global semiconductor industry, giving great pressure to its rivals like Intel or Samsung (SCMP 2021).

In May 2021, apart from the drought, Taiwan was meanwhile attacked by a Covid virus variant. Local resources were centralized to ensure the Science Park firm's regular operations. The government constructed a supplementary waterline project to transfer the water from Taoyuan and New Taipei City to cover the needs of the HSP high-tech firms, while the neighboring areas had to endure the water restrictions on agriculture and household water use. Moreover, despite local communities having limited capacity on PCR testing, the on-site testing stations of Covid quick tests has been arranged to protect the HSP when an outbreak appeared among foreign workers in a wafer probing firm's assembly lines in the nearby county Miaoli.

Debates on the HSP's grabs over the local had existed among Taiwan's civil activism circle for a long time. The activism against Science Park's expansion on farmland in Miaoli county even inspired large-scale protests on land justice issues under the Nationalist Party (KMT)'s rule in 2014. These movements mobilized student participation in party politics, which later contributed to the Democratic Progressive Party's (DPP) regaining of power in the Sunflower movement (Hsing 2017).

Moreover, environmental and social movements earlier criticized the HSP microelectronics industry for causing water and soil pollution to the neighboring areas (Chiu 2014).

Yet, in 2021, the government enhanced Science Parks’ privileges on resource distribution more than ever. Both the ruling party and opposition parties, even the civil society, agree that the operation of the science park should not stop by any accidents. The phenomenon was unusual in a place where social movements are active. As researchers had pointed out, the HSP’s success in economic growth constrained resistance from the locals (Chang et al. 2006). In addition to that, it is worthy to notice a particular structure of governance shared by the influential high-tech firms and the state in the present case of Taiwan. These firms provide complementary (or competitive) governance for the state, while the state serves the industry’s interests by securing resource allocation and supporting infrastructure fixes. The following part will illustrate in detail of water distribution and vaccine purchase cases that represent such interactions between the influential high-tech firms and the state.

### Allocating the Water

In 2020, TSMC ranked the third biggest company on world’s semiconductor sales, with an increase of 31% than the previous year. Another HSP company MediaTek jumped to the top 11 as its sales soared 35% (IC Insights 2020). Booming sales of the IC firms increased HSP’s water consumption. Table 1 shows the HSP’s water consumption from 2019 to 2021. In the peak month, the average water consumption of the HSP was more than 160 thousand tons per day. The TSMC company consumed one-third of it with 57 thousand tons of daily water usage (TSMC 2021a).

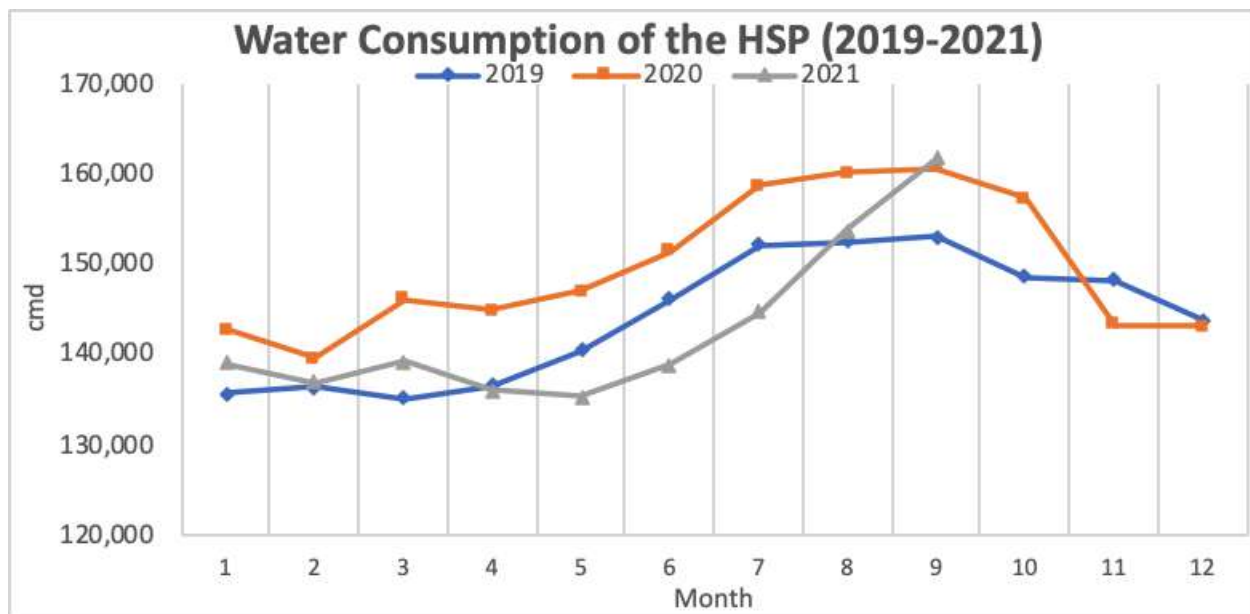
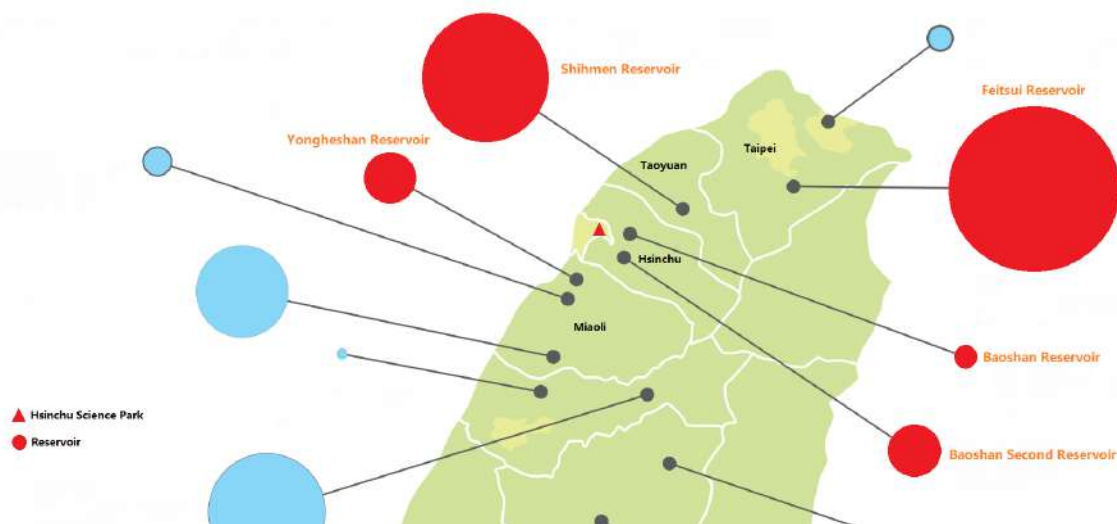


Table 1 Water Consumption of HSP (2019-2021). Data source: MOST.

In typical conditions, Taiwan’s agriculture consumes the most significant volume of water throughout the year, amounting to around 70% of the total water supply. In comparison, industrial water usage only accounts for 10% (Water Resources Agency 2020). But in the surrounding area of the HSP, the agricultural sector’s water consumption was lesser than the industry, and it has been on a constant

decline year by year.<sup>[1]</sup> As the island's resource amount is limited, water sustainability becomes a huge problem for the Taiwanese high-tech industry. No matter which party regime holds power, the government conducts an "HSP-centered hydraulic order" (Tsao 2021) on regional water allocation to support the huge water demand of the electronic industry, making the HSP monopolistic power to the local water resource. The two reservoirs in Hsinchu, the Baoshan Reservoir and Baoshan Second Reservoir, established in 1986 and 2006, mainly serves for the HSP firms. Besides using water from local reservoirs and rivers, the HSP uses three other reservoirs (Shihmen Reservoir, Feitsui Reservoir, and Yongheshan Reservoir) in neighboring cities. Rather than being a regulator to supervise the large water consumer, the government acts more like a collaborator to allocate more water to the HSP firms. Regulation on water recycling and reclamation in the HSP (MOST 2018) was implemented in 2018, which has a weak constraint force on the industry.



Picture 1 Map of reservoirs that supply water for the HSP (Made by Author)

Source: <https://ioi.tw/reservoir/>

The mixture of public and private interests of the science park creates an ambiguous space for corporate governance in the HSP. Since the HSP is set to facilitate the high-tech industry, corporations inside gain governmental support in various aspects. On the other side, in its nature, corporations are designed as profit-driven entities that only be responsible to their boards and shareholders. Market's neoliberalist ideology assumes that modern corporations are pure "nexus of contracts" among private individuals. In this light, David Ciepley (2013) posited that the governmental origin of corporations breaks the boundary of public and private sectors. Corporations are a kind of "franchise government," where the foundations of corporate ownership and managerial authority are detached: the former derives from the corporate itself, while the latter is under the nonnegotiable governance. Agreeing with Robert Dahl's statement on the nature of antidemocratic implications in the shareholder-oriented corporation, Ciepley further declared that there lies a gap between the stock ownership and the asset ownership so that the shareholder who has the right to vote is not the one who truly controls the corporate. The authority of corporate control originates from the legitimacy under governmental regulations and laws. A business corporation operates contrary to the liberal ideology, as it is precisely a for-profit government authorized by the state. In

this sense, Ciepley regards the corporate itself as a socialized property. The public interest provides the legitimacy of the corporate (Ciepley, 2013).

Corporations in the state-led science park have private interest that partly overlap the state interest. Thus, corporation governance not only takes effect within the company, but also expands to a broader range of the society. Especially in Hsinchu, where the high-tech industry ensures the city a high level of average personal income, education and employment structure, the birth rate, etc. The “HSP-centered hydraulic order” is one of the cost externalizations of the HSP companies.

In seeking water for the high-tech firms, the government played two active roles: the distributor and the mediator. Amid the serious drought period, what would happen if one public interest has a conflict with another public interest? In the competition for water between the Agri sector and the industrial sector, the government immediately took action to conduct an industry-oriented water distribution measure. In the heading season of rice paddy in 2020, the Ministry of Agriculture stopped the water supply for farming in Hsinchu. Peasants were disappointed about the measure (Zhong et al. 2021). The outage of irrigation water made their whole year sweat working on the farmland be wasted. As the drought continued, the government cut off the household water supply for two days in one week. This stringent measure lasted for months, affecting millions of people living in middle Taiwan. Besides, the government urgently fixed the weak water supply infrastructures; it even started installing seawater desalination machines<sup>[2]</sup> and constructing cross-regional waterlines.

The mediator function from the governmental side might not be apparent in normal times, as science parks have their own bureaus to execute and negotiate with the needs of firms. But during emergencies, the government’s mediating functions become prominent. The government acted as an intermediary to assist high-tech firms negotiating the water resource with other private sectors. A representative case is the vicarious performance of reclaimed water contracts between the Tainan municipal government, the TSMC Tainan branch, and the Chi-mei corporation in May 2021. In this case, Tainan municipal government actively persuaded Chi-mei, a large electric appliance company, to exchange a certain amount of tap water with TSMC’s promised reclaimed water (CNA 2021). Adopting the idea of carbon trading, it was a trilateral trade of reclaimed water, from which the TSMC got qualified water for chip manufacturing, the Chi-mei corporation cost lower on purchasing the reclaimed water, and the local government gained a good reputation in doing a favor for the TSMC.

Other private sectors were willing to provide their water resource to the high-tech firms, too. Real estate businesses performed generously. More than ten companies claimed that they were ready to extract the underground water in their construction spots for the science park firms. Firms like the TSMC quickly responded and sent water carts to the construction spots.

Water shortage-induced negotiations and performances manifested a common notion about supporting the chip-power. The idea was based on the calculation of future profit that the booming semiconductor makers should gain. Moreover, a phenomenon of economic nationalism emerged and was shared by the state players and society. Recently, people described TSMC as the “protective sacred mountain” that defends the nation (Taipei Times 2021). In other words, to defend TSMC and other IC suppliers is to defend the value and the future of Taiwan.

### **TSMC: More Than A Private Company**

Since the HSP was built up during the late period of the Chiang family's authoritarian rule, developmental state analysis involved the HSP into a general model of state-led industrialization since the 1970s when latecomers intended to catch up with the technology of the advanced countries (Amsden & Chu 2003). The view from the state emphasized the role of state bureaucrats in initiating the competitiveness of the private sectors in the global market (e.g., the nurturing plan of TSMC by Industrial Technology Research Institute) (Tsai 2009). The ruling of the populist DPP continued the KMT's state-led plan on expanding the science park to more cities and investing in strategic industries (Hsu 2011).

Although the governmental intervention upon the Science Park has been clearly examined, few studies showed the social engagement and political orientation on the science park firm's level. Since the 1990s, research works were more concerned about the shift of Taiwanese enterprises to China, mainly due to its potential impact on Taiwan's economic and political independence (Hung 2011). The increasing reliance on China even shaped Taiwanese enterprises the "political agency" of the One-China Policy (Wu 2017).

Questions remained to how these state-initiated Science Park and the growing electronic industrial clusters positioned themselves in the changing relationship between the state and the society. Specifically, as influential tech firms that can control transnational supply chains, firms-as-actors in the economic-political arena pursue profits and have their own political agendas to influence and even shape the external environment for future development. It is fair to say that Science Parks have always stood among hybrids of politics -the constellation of authoritarian aftermaths, neoliberalist governance, global managerial elites' control, technological determinism, and public scrutiny.

The current performance of TSMC would be an excellent example to illustrate the ambiguous boundary regarding the public responsibility of the influential high-tech company in Taiwan. Classical explanations on the Corporation Social Responsibility (CSR) are not enough to explain TSMC's engagement in purchasing the BioNTech vaccine for the whole society. The decision to acquire vaccines represented high-tech firms' interests as they eagerly maintained stable operations during the pandemic. The Allied Association for Science Park Industries proposed to buy vaccines through the professional's overseas resources. Still, the solution was managed by two influential companies, TSMC and Foxconn. Contracts of 10 million doses of BioNTech vaccines were signed directly between the two companies and Shanghai Fosun, the distributor of Pfizer-BioNTech Covid-19 vaccine in the greater China area.

Considering the prevailing cross-strait politics, it was indeed challenging to achieve such an assignment, while Terry Gou, the leader of Foxconn, had political ambitions to challenge the ruling party. Thus, TSMC had to perform as a negotiator to balance multilateral controversies, processing the vaccine deal under a commercial frame. In the 2021 Q3 earning report, TSMC claimed that its expenses on vaccines donation will have around 1% impact on the company's operating margin (TSMC 2021c).

Why did the TSMC company take on a job that goes far beyond the concerns of private companies?

To a certain extent, Ciepley's idea on the corporate as the "socialized property" is partly realized in the form of state-owned enterprise, while he expressed strong critiques on an irresponsible state bureaucracy in the socialist regime due to the detachment of control and ownership of the state property. The case of TSMC provides a new perspective to apply Ciepley's idea on the normative

power by the public interest upon the corporate. Approximately 12% of the TSMC shareholding are state capitals, including the National Development Fund and Labor Pension Fund of Taiwan, the sovereign funds of Singapore, Norway, and Japan, while the stock players in the American market constitute the major shareholder, totally occupying more than 20% (TSMC 2021b). It is a company owned by multiple social entities across nations, and its stable long-term growth made it a profit driver for different state interests.

Moreover, the company built a reputation in world trading through its extremely advanced technology and the plurality of its managerial members, making itself a good business model under the domination of managerial capitalism (Lind 2019). These strengths allow the company to provide competitive governance because the Taiwan government has weak negotiating power compared to other global powers. In other words, the TSMC can support Taiwan when the government is trapped in a diplomatic dilemma. As people in Taiwan embrace economic nationalism than ever before, the TSMC represents a new image of efficient governance.

The case of vaccine purchasing showed a legitimate reverse foundation among the corporate and the state. The awkward sovereignty of Taiwan in-between the two superpowers gave space for the TSMC's quick expansion and increasing profit. By taking responsibility in the social crisis, the corporation's complementary governance enhanced the government's legitimacy.

### **Conclusion**

The ongoing trade war between the US and China and the global pandemic made the Taiwanese high-tech firm cluster more influential in the local and international landscape. The HSP's dominating power towards the local resource distribution is predictable to continue. It is clear that those influential high-tech firms are externalizing corporate governance to the whole society. The corporation's performance has already been involved in economic nationalism and populist ideology, while the corporation's asset constitution was held and shared by international players. The changing situation for the HSP might go beyond the government's expectation, and it would be a good opportunity for us to observe whether the social engagement of the influential high-tech firms really makes a difference.

### **Notes**

[1] Statistic shows that the irrigation water flowing into the farmland nearby Touqian River, the main cultivated area around HSP, was declining from 43,574 kilotons in 2011 to 32,342 kilotons in 2017 (Tsao 2021). The water consumption of HSP increased from 48,166 kilotons in 2011 to 50,851 kilotons in 2017 (MOST).

[2] Since 2003, Executive Yuan had already deployed the desalination plant project in Hsinchu. The construction has not been completed yet, while some machine sets were managed to operate to address Taiwan's water shortage. However, the quality of the desalinated seawater could not meet the requirement for high-tech industrial use.

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