2023 STARTUP ECOSYSTEM INVESTOR REPORT

Paving the Way Towards the Taiwan Miracle 2.0

Startup Island TAIWAN

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Acknowledgements

Startup Island TAIWAN

Startup Island TAIWAN is the national startup brand of Taiwan. The brand symbolizes a journey from a startup island to the international arena. It demonstrates to the world the strong ambition and capabilities of Taiwan startup companies as well as their intention and ability to contribute to other startup ecosystems around the world.

Taiwan Institute of Economic Research

Taiwan Institute of Economic Research (TIER) was established on September 1, 1976 by Dr. Chen-Fu Koo as the first private independent think tank in Taiwan. The main purpose of the institute is to actively engage in research on domestic and foreign macroeconomics and industrial economics in order to provide consultations to the government and enterprises and to promote Taiwan's economic development.

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Editor's Note

In recent years, Taiwan has made consistent and significant efforts to establish itself as an innovative hub for entrepreneurship, attracting visionaries and industry leaders. These efforts have not only led to the emergence of Taiwan's thriving startup ecosystem but have also positioned the country as fertile ground for transformative ideas and technological breakthroughs. Since the 1990s, the term "digital transformation" has gradually gained traction. Today, with the world undergoing rapid digital transformation, and with the impact of COVID-19 accelerating this process, gaining insights into various startup ecosystems for opportunities has become essential for individuals and organizations alike.

This report aims to take readers on an exploratory journey of Taiwan's startup ecosystem, providing a comprehensive overview and showcasing insights into the opportunities the ecosystem has to offer. It delves into the role played by the Taiwanese government in creating a favorable environment for startups and illustrates how these efforts contribute to the success and growth of Taiwan's startup ecosystem. Our report further extends to the landscape of venture capital investments, encompassing both domestic and international organizations in Taiwan and evaluating their impact. Additionally, the report provides an assessment of the advantages and strengths that make Taiwan an attractive investment destination. Furthermore, we discuss the investment opportunities in Taiwan, including an interview conducted with Hive Ventures' founder to investigate the emerging innovation trends resulting from enterprises' adoption of artificial intelligence.

Our intention is to empower readers with the knowledge necessary for informed decision-making and to inspire exploration of the exciting opportunities that await in Taiwan's vibrant startup ecosystem. Furthermore, we aim for this report to spark a thought among our readers and prompt the question: Is Taiwan on the trajectory towards the Taiwan Miracle 2.0?

Editors

Christine Wang, Sebastian Chen
Vuttisak Busabok, Allen John Ku

Introduction

The startup ecosystem in Taiwan has witnessed substantial growth in recent years. Within this context, two significant factors are worth discussing: government initiatives and capital investments. The Taiwanese government consistently takes proactive measures to foster innovation and entrepreneurship, creating an enabling environment for startups to succeed. Initiatives like the establishment of the National Development Fund, startup hubs, and favorable regulatory frameworks provide startups with the essential resources and guidance they need to thrive.

In addition to governmental support, Taiwan has experienced a rise in capital investment within its startup ecosystem. Both domestic and international investors recognize the potential and opportunities presented by Taiwan’s startup ecosystem, resulting in increased funding rounds and successful exits. This influx of capital not only provides financial backing but also serves as a global validation of Taiwan's startup scene.

Taiwan also possesses distinct advantages that position it as an exceptional destination for startups and investors. Its strategic geographic location in the heart of Asia grants convenient access to major consumer markets. The presence of a highly skilled workforce, advanced technological infrastructure, and a supportive business environment further enhances Taiwan's appeal as a thriving startup hub. Considering these factors, Taiwan's flourishing startup ecosystem encompasses diverse industries, offering a wealth of investment opportunities. Investors in Taiwan have the chance to actively participate in the growth of innovative startups ready to make significant contributions across various sectors.

This report aims to offer insights into the various factors that have shaped the contemporary Taiwanese startup ecosystem. It seeks to equip readers with a comprehensive understanding of Taiwan's dynamic startup landscape and the promising investment opportunities it holds. By examining government initiatives, capital investments, and industry trends, this resource serves as a valuable guide for entrepreneurs, investors, and stakeholders interested in exploring the possibilities offered in Taiwan.

Market Overview and Economic Indicators

In this section, we provide a brief overview of Taiwan's startup ecosystem, including an examination of the market and several economic indicators. We discuss how these factors contribute to the country's growth and potential.

Overview of Market and Startup Ecosystem

Taiwan's startup ecosystem has witnessed growth in the past years. It has also displayed immense potential. These are supported by positive economic indicators and market trends.

Renowned for its technological prowess, especially in semiconductors and electronics, Taiwan remains a driving force in the global technology industry, constantly pushing boundaries and staying relevant.

The nation's robust economic performance plays a pivotal role in bolstering its startup scene. **Over the last decade, Taiwan has maintained a stable GDP growth rate, thanks to successful developments in high-tech industries and seamless integration into global value chains.** This stable economic environment provides an ideal breeding ground for startups to flourish, fostering a culture of innovation and entrepreneurship.

Taiwan benefits from a highly skilled workforce, a proven track record of innovation, and its strategic location in the Asia-Pacific region. Furthermore, the country enjoys a distinct advantage compared to some other regional players, being less exposed to political risks due to its solid foundation in the global supply chain ecosystem and strategic alliances. Apart from its dominance in chip production, **Taiwan is also home to leading pharmaceutical and biotechnology firms, making it a potential global hub for life science research and development.** Additionally, Taiwan's strong expertise in the semiconductor industry positions it as a leader in secure software development.

The country's efficient and transparent business regulations, along with a robust legal framework and measures to enhance investor protection and contract enforcement, have effectively attracted foreign investors. Additionally, tax incentives and streamlined investment procedures further contribute to the significant demand for investment in the technology sectors.

Taking note of these achievements, **StartupBlink's 2023 Global Startup Ecosystem Report highlights Taiwan's substantial progress on the global startup stage, currently ranking 24th worldwide and 4th in East Asia.** This recognition not only attracts attention from investors but also nurtures an atmosphere of innovation, collaboration, and entrepreneurial spirit within Taiwan's startup community.

The International Institute for Management Development (IMD) is a prestigious Swiss independent academic institute. IMD introduced a comprehensive annual report known as the IMD World Competitiveness Yearbook (WCY). This report offers benchmarking and trends analysis based on extensive research data, ranking countries according to their competencies' management for long-term value creation. Since its inception, the WCY has become a global reference point for assessing countries' competitiveness. **Below, we highlight Taiwan's rankings in IMD's 2023 WCY and its overall performance trend over the past 5 years.**

Overall Performance

6th
out of 64

Government Efficiency

6th Public Finance

7th Tax Policies

Infrastructure

5th Science Infrastructure

7th Technology Infrastructure

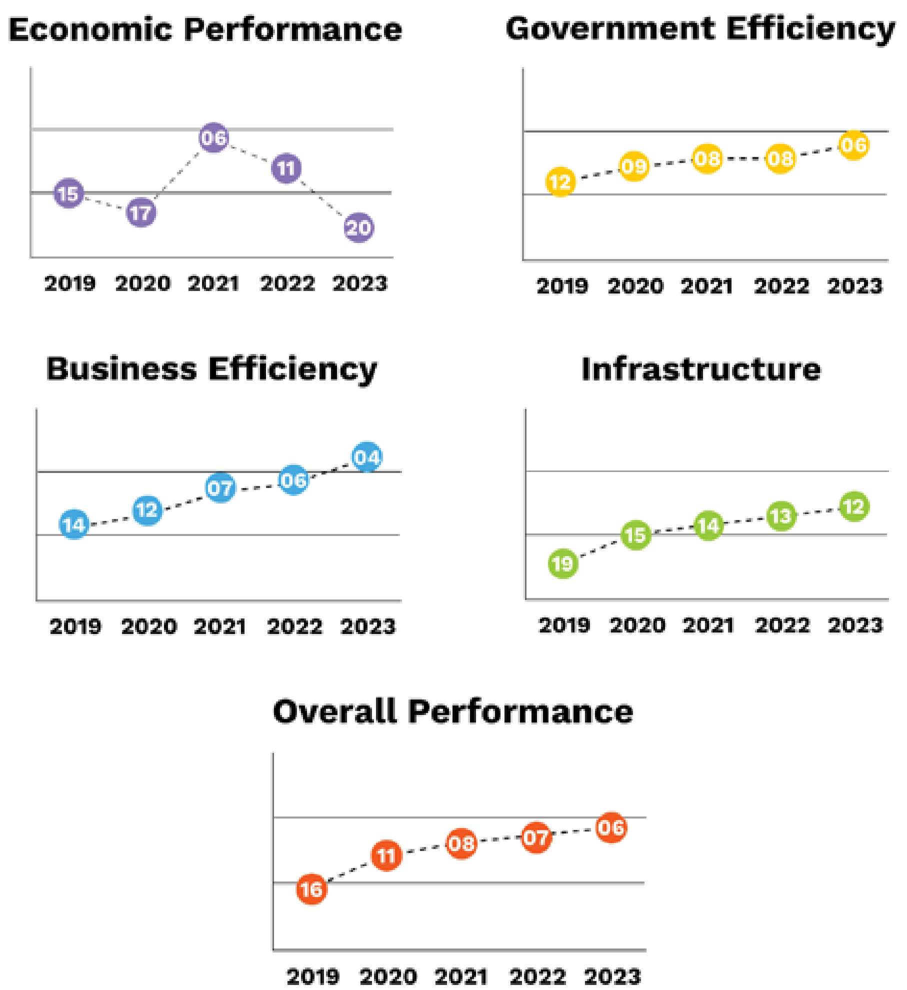
Business Effciency

3rd Management Practices

6th Finance

7th Productivity & Efficiency

7th Attitude & Values



Source: IMD 2023 World Competitiveness Ranking

Key Advantages of Investing in Taiwan

1. Strategic geographic location and access to regional markets.
2. Strong technological infrastructure and innovation capabilities
3. Skilled workforce and supportive talent pool ecosystem
4. Ease of doing business

Strategic geographic location and access to regional markets

Historically, Taiwan has been known by various names, such as Formosa and the Republic of China. Beyond its captivating allure, Taiwan's location holds immense strategic value militarily as one of the "first island-chain" described in U.S. foreign policy. However, the significance of Taiwan goes beyond military positioning; it serves as a geographically advantageous destination for businesses, offering a numerous opportunities.

Positioned at the heart of Asia, Taiwan enjoys a distinct advantage with its surrounding major consumer markets, including China, Japan, Indonesia, Singapore, Russia, and Korea. This strategic location gives businesses a significant edge, providing access to a wide range of prospects. Additionally, Taiwan's proximity to five major Asian ports—Manila, Singapore, Hong Kong, Shanghai, and Tokyo—solidifies its crucial role as a vital transportation hub. Seamlessly connecting both Northeast and Southeast Asia, Taiwan becomes a gateway for trade and collaboration within and beyond these neighboring markets.

Complementing its strategic location, Taiwan's transportation infrastructure offers unparalleled accessibility and connectivity, further enhancing its appeal as an international business hub. To support its vibrant business ecosystem, Taiwan has made significant investments in the development of comprehensive infrastructure. The island features advanced railways, roads, and urban mass rapid transportation systems that efficiently connect the northern and southern regions of Taiwan. This interconnectedness enhances business operations and streamlines the exchange of goods and services. Moreover, Taiwan's well-positioned port facilities, coupled with a well-connected network of international airports, facilitate smooth trade and collaboration, ensuring seamless connectivity with global destinations.

Taiwan offers numerous advantages that make it an attractive destination for businesses seeking collaboration in technical research, development, and promotion. Its strategic geographical location, outstanding transportation infrastructure, and proximity to major consumer markets and ports create an ideal environment for international trade and engagement.

Strong technological infrastructure and innovation capabilities

The rapid industrialization and economic growth of Taiwan took off in the late 1950s, soon after World War II. During this period, Taiwan capitalized on its cheap labor and manufacturing capabilities, giving rise to the notable "Made in Taiwan" era and the “Taiwan Miracle”. The country gained recognition for its affordable exports of textiles and toys. Over the following two decades, Taiwan gradually shifted its focus towards the expansion of heavy industry and infrastructure development in the 1970s, before ultimately transitioning to advanced electronics. A significant milestone in this shift was the establishment of the Hsinchu Science Park in 1981.

Since then, Taiwan has emerged as a global powerhouse, ranking as the second-largest producer of information technology hardware equipment and serving as a vital industrial base for manufacturing, production, and innovation. The country's foundry, packaging, and testing industries hold the top spot worldwide, while its integrated circuit (IC) industry ranks second, and its PC products rank third. As a result, multinational tech giants such as Google, Microsoft, NVIDIA, ASML, and Ørsted have reinforced their investments in Taiwan, fostering collaborations in research and development, advanced manufacturing, and industrial partnerships.

One of the most prominent names associated with Taiwan's technological prowess is the Taiwan Semiconductor Manufacturing Company (TSMC). This single corporation alone produces around 60% of the global chip supply and approximately 90% of the world's most advanced chips. Leveraging the technological infrastructure, innovative capabilities, and experience accumulated since the 1950s, Taiwan is now expanding its scope into various domains, including EV-related Smart Mobility, Cybersecurity, Cloud Computing, IoT, Big Data, and 5G Technologies. Today, Taiwan frequently makes headlines in international news, thanks to its renowned companies and technological achievements. This shows that the country's success story continues to evolve as it leverages its strengths to venture into new technological frontiers.

Skilled workforce and supportive talent pool ecosystem

In 2022, Taiwan secured the 19th position out of 64 countries in the International Institute for Management Development's World Talent Ranking, solidifying its status as a major global hub for the high-tech industry. Within Asia, Taiwan claimed third spot, following Hong Kong and Singapore. This recognition stems from Taiwan's abundance of research and development (R&D) personnel, as it ranked first globally in terms of R&D personnel per capita and third in higher education achievement, according to IMD's 2022 ranking. Startup Genome's 2023 Global Startup Ecosystem Report also supported this assessment, with Taipei ranking in the top 30 in the Emerging Ecosystems Ranking, scoring 9/10 for knowledge and 8/10 for talent and experience.

Acknowledging the international community's recognition of Taiwan's talent pool, the Taiwanese government remains committed to nurturing, strengthening, and attracting both local and international talents. Collaborating across various ministries such as Education, Labor, and Economic Affairs, the government launched the Key Talent Cultivation and Recruitment Program to transform Taiwan into a global talent hub. The program aims to enhance the local talent pool by cultivating bilingual abilities and fostering international perspectives.

For international talent recruitment and employment, Taiwan offers programs such as the Employment Gold Card and the Entrepreneur Visa Program. The Employment Gold Card, created by the National Development Council, provides a comprehensive 4-in-1 card combining a work permit, resident visa, alien residence certificate, and re-entry permit. It also offers retirement, health insurance, and tax benefits to attract and support international professionals. The Entrepreneur Visa Program, established by the Ministry of Economic Affairs, targets international entrepreneurs and startups interested in establishing or developing their businesses in Taiwan.

In 2018, Taiwan introduced the New Economic Immigration Act, further emphasizing the recruitment of foreign professionals, foreign mid-level technicians, overseas compatriots, and immigrant investors. This act includes the relaxation of job qualification requirements and employment conditions for foreign professionals, paving the way for increased opportunities and a more inclusive environment.

Through these initiatives, Taiwan aims to not only enhance its local talent pool but also attract top international talents, fostering a diverse and innovative ecosystem. The government's commitment to talent cultivation and recruitment reflects its dedication to driving economic growth and reinforcing Taiwan's position as a global leader in the high-tech industry.

Ease of doing business

In 2019, Taiwan achieved a commendable ranking of 15th among 190 countries on the Ease of Doing Business rankings by the World Bank. Although it slightly dropped in the 2019 rankings, Taiwan has maintained an impressive average ranking of 12th from 2014 to 2019. This consistent performance underscores Taiwan's commitment to providing an environment conducive to business growth and prosperity.

Taiwan's score of 80.9/100 in 2019 reflects the efficiency, transparency, and well-built legal framework of its business regulations. The government has taken proactive steps to support both new and established businesses by streamlining the business registration process, simplifying tax procedures, and improving access to credit. These measures aim to reduce administrative burdens and foster a more business-friendly environment.

Furthermore, Taiwan extends its support to investors, recognizing their crucial role in driving economic growth. The government has implemented measures to strengthen investor protection and enhance contract enforcement. By ensuring a robust framework for investor rights, Taiwan provides a secure and reliable environment for both local and foreign investors.

The combination of these supportive measures for businesses and investors positions Taiwan as an attractive destination for innovation, entrepreneurship, and investments. The business-friendly environment, coupled with a commitment to fostering a culture of innovation, sets the stage for economic growth and prosperity in the country. Taiwan's continuous efforts to improve its business climate highlight its dedication to creating opportunities and a favorable environment for businesses to thrive.

Government Resources and Support

Taiwan's emergence as a dynamic and thriving startup hub can be attributed to the Taiwanese government's dedicated support in fostering a vibrant startup ecosystem. Recognizing the vital role of startups in driving economic growth and technological advancement, the government has implemented comprehensive policies and initiatives to nurture their growth. To further support the sector, the government offers assistance in funding, support programs, and initatives, encouraging development in the startup ecosystem.

Government Funding

Government resources play a crucial role in the development of startups, as affirmed by a survey report conducted by the Taiwan Institute of Economic Research and PwC Taiwan. The report, which gathered data from startups and investors, emphasizes that **financial relief, subsidies, loans (paired with training programs and access to incubators/accelerators), are perceived as the most advantageous forms of government support by startups.**

In the context of government financial support, one key player worth discussing is the National Development Council (NDC) and the National Development Fund (NDF) in Taiwan. The NDF, managed by the NDC, plays a crucial role in promoting economic development and strategic investments within the country. To specifically support the startup sector, the NDF introduced the 5-year Startup Business Angel Investment Program.

The objective of this program is to establish a robust startup investment mechanism and enhance the angel investment environment in Taiwan. It aims to provide initial and subsequent operating capital to eligible startups through co-investments with the NDF, angel investors, and domestic or foreign investment institutions. The program has been allocated a budget of NT$5 billion by the NDF.

Eligibility for startups includes those registered in Taiwan or overseas startups with significant operations in Taiwan. These startups should be established within five years and have paid-in capital or fundraising of no more than NT$1 billion.

Angel investors participating in the program are expected to provide mentorship to the invested companies. Eligible angel investors can be angel investment funds, venture capital firms, angel investment organizations, angel investment clubs, accelerators, or incubators.

Since its launch in late 2018, the program has achieved significant success.

Invested in:

241 startup businesses

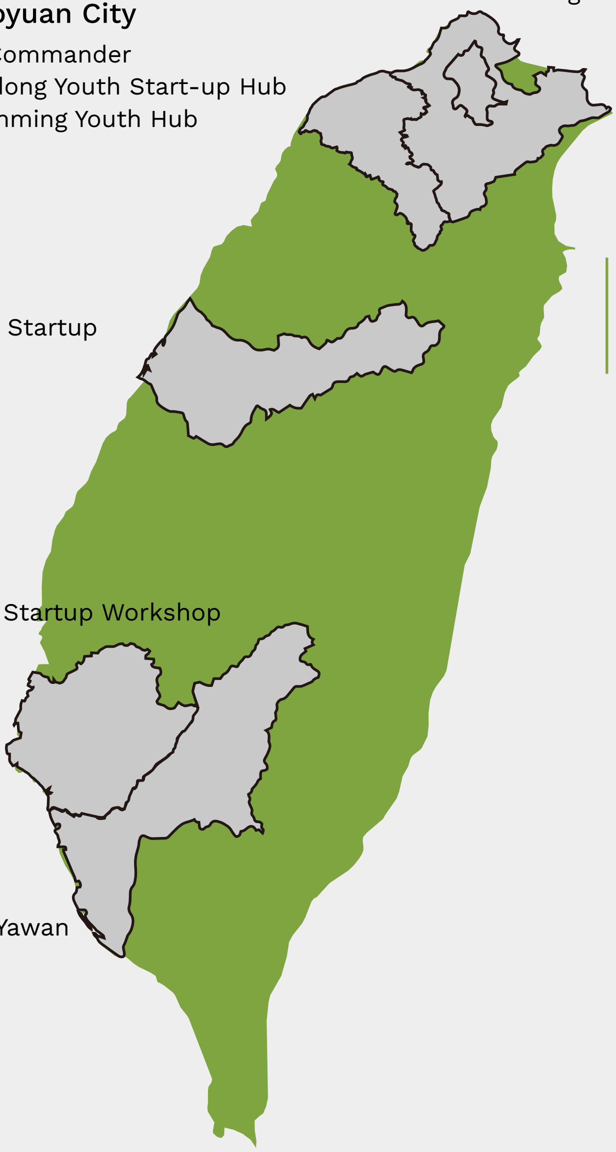
Total approved angel investment:

NT$3.312B

Government-Supported Startup Hubs

The Taiwan government has taken proactive measures to establish numerous startup hubs across the country. These hubs provide physical infrastructure, co-working spaces, state-of-the-art facilities, and etc. that enable startups to operate and grow effectively. Moreover, they offer networking opportunities, mentorship programs, and access to industry experts, fostering a supportive ecosystem for early stage startups to thrive.

Below is an overview of major startup hubs across Taiwan. On the next page, we explore the specifics of some of these prominent startup hubs.



Taipei City

Taiwan Startup Stadium
t.Hub Incubation Center
Taiwan Tech Arena (TTA)
FinTechSpace
Garage+

Taoyuan City

TYCommander
Andong Youth Start-up Hub
Hsinming Youth Hub

New Taipei City

Startup Terrace Linkou
AWS Joint Innovation Center
Innosquare
Tpark

Taichung City

Southern Taiwan Science Park Startup Workshop

Tainan City

Taiwan Tech Arena (TTA) South
Southern Taiwan Science Park Startup Workshop
C-Hub
Fablab STMC

Kaohsiung City

Startup Terrace Kaohsiung Yawan
KOSMOS
KO-IN
Pier.2 Base

Taiwan Tech Arena, North and South

Established in 2018 at Taipei Arena under the guidance of Taiwan's Ministry of Science & Technology, Taiwan Tech Arena (TTA) is considered a flagship builder of the startup ecosystem. With a primary focus on AI, semiconductor manufacturing, and software development, TTA strives to cultivate a vibrant entrepreneurial environment within Taiwan. TTA offers startups exposure through a dedicated marketing platform, connecting startups with experienced mentors, and facilitating networking within Taiwan's extensive startup community. Moreover, one notable service provided by TTA is granting foreign startups access to local resources, including introductions to various service providers, investment opportunities, and strategic partnerships. These initiatives collectively create a high-quality environment for Taiwan startups and effectively position Taiwan as an alluring destination for foreign startups aiming to establish their presence in Asia.

The Ministry of Science and Technology also established the Taiwan Tech Arena South Branch in the Tainan Shalun Smart Green Energy Science City in 2021. This establishment aims to serve as a prominent international startup ecosystem, as well as an experimental community in southern Taiwan. Its primary emphasis lies in the fields of "smart technology," "precision health," and "clean circulation." The objective is to foster seamless collaboration and implementation of technology startups and businesses in southern Taiwan, while simultaneously forging connections to global markets, investment-driven accelerators, and international investors.

Startup Terrace, Linkou and Yawan

Established in October 2019, Startup Terrace was created through a collaboration between the Small and Medium Enterprise Administration (SMEA) and the Ministry of Economic Affairs (MOEA) with the goal of fostering the startup industry and establishing a prominent center for global entrepreneurship. Situated in New Taipei's Linkou District, Startup Terrace currently holds the distinction of being the largest international startup hub in Taiwan. This hub provides a wide range of facilities, including offices, accommodation, co-working spaces, and an exhibition center, creating an ideal environment for startups to thrive. With state-of-the-art infrastructure and a supportive ecosystem, Startup Terrace attracts foreign entrepreneurs to establish their presence in the region.

In 2021, the SMEA and the MOEA expanded the "Asia New Bay Area 5G AIoT Innovation Park" project with the aim of boosting startup development in southern Taiwan. The primary objective of this initiative is to establish connections with global tech hubs, introduce international resources and innovative energy, and encourage domestic and foreign venture capital investment while ensuring startup development in both northern and southern Taiwan. As part of this effort, Taiwan Startup Terrace Yawan Branch was established in Kaohsiung with a specific focus on 5G and AIoT. This expansion demonstrates the government's efforts in promoting balanced distribution of hub resources throughout Taiwan.

t.Hub Taipei

t.Hub Taipei, situated within Neihu Technology Park, is the result of a collaborative endeavor between the city government and Hon Hui Rui Guang Company, with the shared objective of establishing a lively and forward-thinking startup community. Operation started in 2020, t.Hub Taipei has partnered with ITRI (Industrial Technology Research Institute) and the advanced technology clusters of Neihu Technology Park, utilizing their expertise and resources. With a commitment to creating a nurturing atmosphere for startups, t.Hub Taipei offers various resources including shared workspaces, mentorship, and avenues for securing financial support.

FinTechSpace

In 2018, the Financial Supervisory Commission of Taiwan (FSC) initiated the establishment of a dedicated co-working space focused on fintech in Taiwan, aiming to stimulate and accelerate the latest fintech innovations in the region. This fintech-focused co-working space was jointly funded by the FSC's private division, the Taiwan Financial Service Roundtable (TFSR), and marked the first of its kind in Taiwan. It provides a technology-driven environment specifically tailored to meet the needs of fintech startups, offering a range of resources including co-working spaces, mentorship programs, and access to funding opportunities. By creating a supportive ecosystem for fintech startups, this co-working space is actively driving innovation and positioning Taiwan as a prominent fintech hub in the region.

Taiwan Startup Stadium

Founded in 2015, TSS has been at the forefront of developing Taiwan's startup ecosystem, focusing on nurturing entrepreneurs with a global mindset and promoting the most innovative startups from Taiwan to the global market. The organization's core mission is to cultivate strong relationships among startups while actively collaborating with local and international partners. TSS offers a wide array of coaching programs, including bootcamps, workshops, and seminars, aimed at empowering entrepreneurs and propelling their growth and success. By providing a platform for startups to connect and share resources, TSS plays a pivotal role in expanding Taiwan's startup ecosystem from its foundation.

Government Initiatives and Regulatory Environment

As one of Taiwan's key government innitatives aimed at fostering growth, 5+2 Innovative Industries Plans was initiated in the late 2010s in correspondence to President Tsai Ing-Wen's key principles of innovation, employment, and equitable distribution. **The 5+2 Innovative Industries Plan aims to promote the transformation and advancement of Taiwan's industries and stimulate economic growth.** In the coming era, the plan will serve as the leading driver of Taiwanese industrial growth and establish a new model for sustainable development. The plan involves the following seven key industries and projects.

Smart Machinery

Launched in July 2016, the Smart Machinery Development Program is a key element of the 5+2 Innovative Industries Plan. It aims to transform Taiwan's machinery industry's traditional precision machinery into smart machinery leveraging Industry 4.0 technologies such as Cloud Computing, Big Data, IoT, AI, and robotic process automation. This transformation will lead to job creation and increased exports of smart production lines and turnkey solutions, establishing Taiwan as the leading high-end manufacturing hub of Asia. With the adoption of smart technologies across industries, Taiwan will undergo a transformational upgrade of its industrial landscape.

Asia Silicon Valley

Approved by the government in September 2016, the Asian Silicon Valley Development Plan aims to connect Taiwan with the international high-tech R&D communities to harness the momentum of emerging industries. As a core initiative of the 5+2 Innovative Industries Plan, the program emphasizes the advancement of IoT technologies R&D and the establishment of a robust innovative startup ecosystem. The plan's objective is to drive economic growth and further create employment opportunities by transitioning the Taiwanese economy into the provider of state-of-the-art services such as Mobile Lifestyles, AI, Autonomous Driving, and XR.

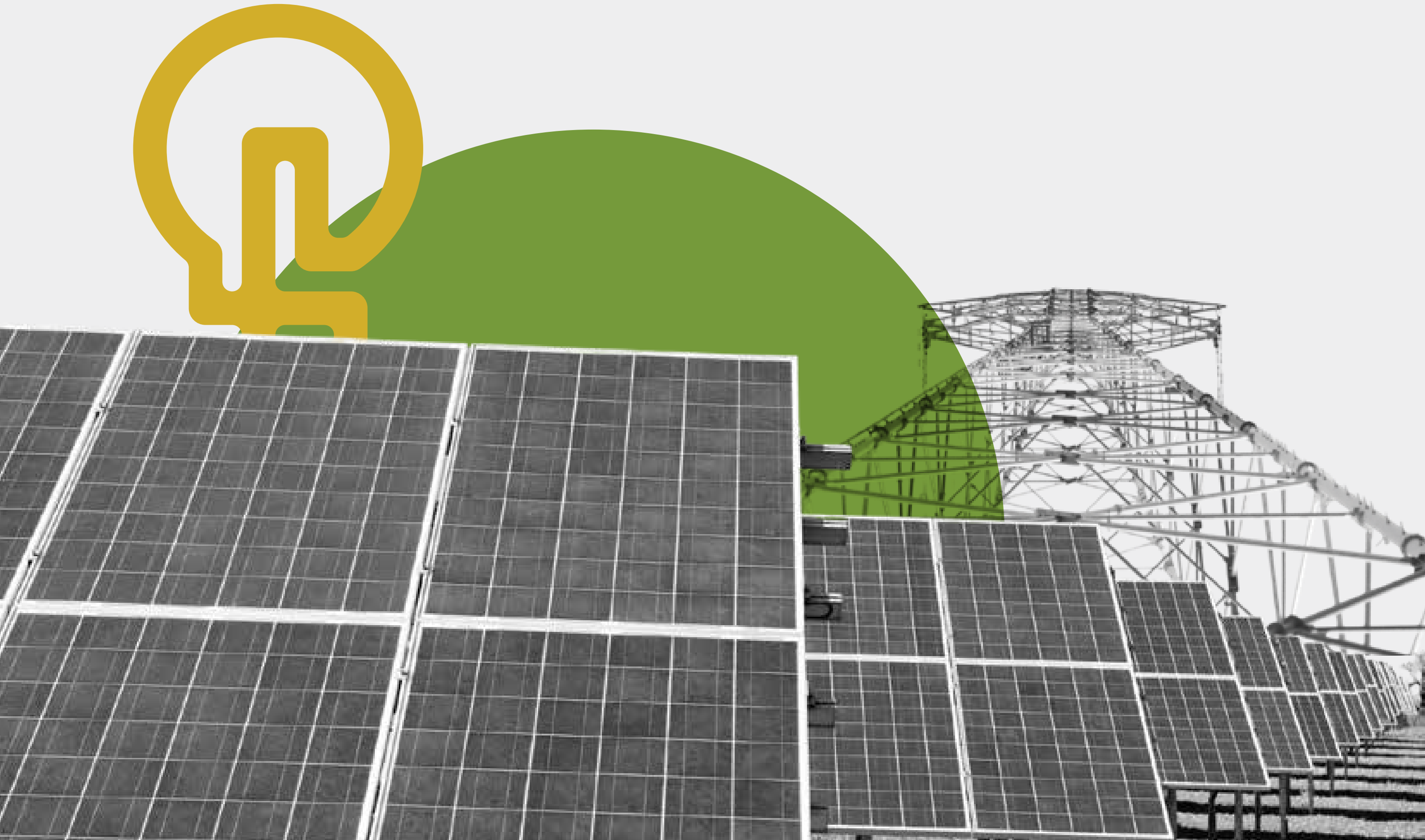
To further foster the adoption of AIoT in an exponentially growing global technological landscape, the Taiwanese government introduced the Asia Silicon Valley Development Plan 2.0 (2021 – 2024). Building upon the achievements of its predecessor, this plan aims to expedite industrial transformation through AIoT, driving innovation and entrepreneurship in the process. By leveraging technologies such as AI and 5G, Asia Silicon Valley 2.0 will expand the reach of IoT applications and promote the export of AIoT solutions.

Green Energy

Approved in October 2016, Green energy is one of the main pillars of the 5+2 Innovative Industries Plan. The objective of this pillar is to effectively transform Taiwan's energy sector, reduce carbon emissions, decrease imported energy dependency, and stimulate innovation by fostering an innovative ecosystem for green technologies. This plan incorporates energy production, conservation, storage, and system integration capabilities. By leveraging green energy technologies, Taiwan is ready to drive energy sector transformation.

Biomedicine

The launch of the Biomedical Industry Innovation Program (BIIP) in 2017 aims to accelerate the growth and development of Taiwan's biomedical industry and improve the health and well-being of its residents and worldwide. The dedicated efforts of this program have already yielded positive outcomes. The Taiwanese biomedical industry has experienced consistent growth in revenue, and significant strides have been seen in talent development, startup ecosystem promotion, innovation cluster establishment, and database compilation.



National Defense (Cybersecurity)

In March 2018, the strategic initiative was approved to foster the growth of the cybersecurity industry. This plan leverages Taiwan's expertise in semiconductors, integrated circuits, and information and communications equipment, and Taiwanese cybersecurity companies can establish a robust national brand known for its excellence. Once the local cybersecurity environment for critical infrastructure is established, the industry will be well-positioned to expand internationally.

New Agriculture

In 2017, the Taiwanese government introduced the New Agriculture Innovation Promotion Program as part of the 5+2 Innovation Industries Plan. The program addresses the challenges arising from global climate change, international trade liberalization, labor shortages due to the aging population, industry rigidity, and concerns over food safety, consumer protection, and environmental sustainability.

Since its launch, the program has yielded notable achievements. In adaptation to the dynamic internal and external conditions, the government built on the program's foundational success factors and created the New Agriculture Innovation Promotion Program 2.0 (2021 – 2014). The refined program will focus on enhancing benefits, strengthening foundations, ensuring food safety, and improving infrastructure. By safeguarding the rights and interests of farmers and promoting safe agricultural products and practices in a manner that increases the profitability for farmers and provides consumers with confidence of safety. These efforts will foster sustainable development in the agricultural industry, support agricultural workers, and enhance farming communities.

Circular Economy

Understanding the finite world we live in, the Taiwanese government drafted a resources recycling and recovery plan in 2018 and has included a circular economy as one of its 5+2 Innovative Industries Plan. In alignment with international practices, the promotion of a circular economy seeks to create a win-win scenario for both the environment and the economy. This plan emphasizes the proper recycling of waste materials throughout their lifecycle, from production and consumption, all the way to disposal and recycling. By prioritizing the extraction of usable materials from waste instead of natural resources, Taiwan is actively progressing toward its goal of establishing a fully circular and zero-waste economy.

To further reinforce innovation, advancement, and growth of key industries in Taiwan, President Tsai Ing-Wen stated the six core strategic industries to be promoted in her 2020 inaugural address. From this address, **the Executive Yuan of Taiwan introduced the plan to promote the 6 Core Strategic Industries on December 10th, 2020. This effort seeks to seize the early opportunities of the global supply chain transformations presented in today's post-pandemic era.** Through the strategic deployment of resources and providing industry support, the initiative builds upon and strengthens the foundation of the 5+2 Innovative Industries Plan, laying the groundwork for Taiwan's future decades of sustainable economic development. The six strategic industries include:

Information & Digital Technology: To uphold and reinforce Taiwan's leadership in the information and communications technology industry, while positioning the nation as a global hub for digital innovation, contributing to global prosperity and security.

Cybersecurity: To establish internationally trusted cybersecurity systems and industrial chains by enhancing defense capabilities in emerging areas and creating realistic simulations for high-level cybersecurity exercises.

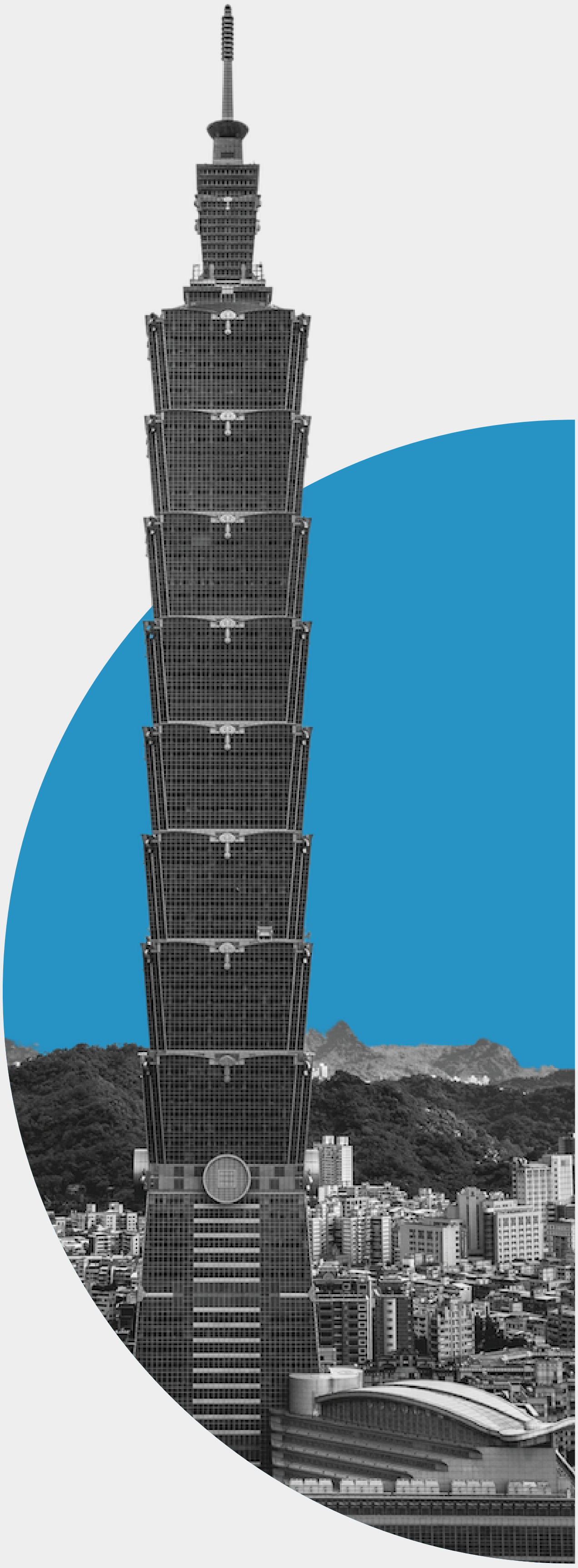
Medical Technology & Precision Health: To introduce precision health and epidemic control solutions and establish Taiwan as the benchmark for precision health and epidemic control technologies by the development of advanced precision medical technologies and systems for prevention, diagnosis, therapies, treatment, and care.

National defense & strategic industries: To position Taiwan as the key supplier of global aviation, shipbuilding, and aerospace industrial ecosystem by fostering self-reliance in national defense by establishing a comprehensive defense industry supply chain.

Green & renewable energy: To establish Taiwan as a model for green energy by establishing industrial parks and research centers focused on green energy and renewables, creating an offshore wind-power project "national team" and connecting with the Asia-Pacific wind power industry.

Strategic stockpile industries: To maintain control over the supply of key raw materials for industries such as semiconductors, batteries, and electric vehicles and to ensure security and stability in critical areas such as energy, food, daily necessities, medical supplies, and disaster response materials by cultivating strategic stockpile industries to ensure the availability of essential materials.

International Venture Capitalists



In this section, we explore some of the notable international VCs making a mark in Taiwan's thriving startup ecosystem. As we delve into their presence, we gain insights into how they are contributing to the startup scene in Taiwan. We spotlight notable Taiwanese companies that have secured investments from these international venture capital firms, demonstrating the potential of these partnerships in influencing Taiwan's rapidly evolving startup landscape. Furthermore, an analysis of the industries where they are most actively invested, as revealed by the Crunchbase database, shed lights on the sectors currently drawing attention and investments.

500 Global is a venture capital firm that specializes in investing in fast-growing, early-stage technology startups. Their focus lies in identifying markets where technology, innovation, and capital can generate long-term value and drive economic growth. By collaborating with key personnel, government units, and enterprises, they actively support the startup ecosystem and foster the development of new innovations. Recognizing the abundance of professional and technical talents in Taiwan, 500 Global identifies numerous investment opportunities that can contribute to a mutually beneficial future.

Leveraging their expertise, 500 Global assists Taiwanese startups in navigating challenges and achieving growth and success by offering advisory and mentorship support. Their mission is to uplift individuals and economies through entrepreneurship, actively contributing to the advancement of Taiwan's technology startup landscape.

With a decade-long presence and investment experience in Taiwan, particularly in the last two years, 500 Global has actively participated in accelerator programs in partnership with the Ministry of Science and Technology and Taiwan Tech Arena (TTA). For one, 500's Startups Incubator Taiwan Branch and TTA co-host an 8-week program that prioritizes business foundations, startup growth, and global scaling. Through these initiatives, they have provided support to 13 promising startup companies from Taiwan, significantly accelerating the development of the country's technology entrepreneurship ecosystem.

Notable investments:

Gogoro, CYBARO, Blocto, GoSky AI, Preteeth AI, and Labfront.

Industry focus:

Software, E-Commerce, SaaS, Information Technology, and Financial Services.

JAFCO

Headquartered in Japan, JAFCO Asia is a key player in early to growth stage investments, providing crucial support to companies in different industries. With a remarkable investment history spanning over 25 years and extensive experience in the Asia-Pacific region, JAFCO offers exceptional risk management support to enterprises. Their strong network of relationships and guidance for management further solidifies their expertise in the field.

On April 24, 2020, JAFCO Taiwan Capital Management Consulting Corp. celebrated a significant milestone by successfully concluding their final closing, securing approximately 2 Billion NTD in funds. This achievement was made possible through the support of various large financial institutions and the National Development Fund of Taiwan, emphasizing the trust and confidence placed in JAFCO's investment strategy.

JAFCO's established presence and diverse investment portfolio exemplify their unwavering commitment to supporting companies in Taiwan's healthcare and technology sectors. By focusing on these industries, JAFCO actively contributes to the growth and development of innovative enterprises, fostering a dynamic ecosystem in Taiwan.

Notable investments:

Appier, Phison Electronic Corpos, Wistron, CHC Healthcare Group, iCHEF, DCard, KKday, Gogolook, and 17LIVE.

Industry focus:

Software, E-Commerce, Information Technology, Biotechnology, and Healthcare.

DRAPER ASSOCIATES

Venture capitalist Tim Draper has demonstrated a strong interest in investing in Taiwan following his departure from China. Draper's initial foray into the Taiwanese market occurred three years ago when he made a strategic investment in "The News Lens," an online news media outlet. Since then, he has expanded his portfolio by investing in eight Taiwanese start-ups, including KKday, Appier, and various emerging technologies and disruptive ventures. Furthermore, Draper has established Draper University, an intensive two-week program designed to nurture entrepreneurs, which has successfully attracted 120 entrepreneurial students from Taiwan.

Renowned for his early investments in China, particularly his support of Robin Lee from Baidu, Draper recently made the decision to withdraw his investment in response to notable disruptions caused by the government. This move underlines Draper's commitment to safeguarding the interests of the businesses he supports.

As an investor, Draper places great importance on visionary future projects that align with his optimistic outlook. Given the current geopolitical landscape and his active involvement in Taiwan's thriving startup ecosystem, Draper holds a positive outlook on investing in Taiwan and its promising trajectory. In further testament to his commitment to the region, Draper highlighted his issuance of a Taiwan Employment Gold Card, which aims to foster stronger ties and support the growth of the local workforce.

Notable investments:

HTC, TSMC, AUO Corporation, UMC, Lextar Electronics, Gogoro, Pinkoi, 17LIVE, KKday, Appier, Taiwan Mobile International, OwlTing, and Winstron.

Industry focus:

AI, Software, Semiconductors, and Electronics Manufacturing.

Headline

Headline Asia, based in Tokyo, Japan, is an ambitious venture capital firm that actively seeks the next wave of world-changing innovation. Headline's operations are divided into four regions: EU, US, Asia, and Latin America. When additional power is required during the growth stage, funds from these regions come together, leveraging a unified Headline culture, technology, and investment philosophy.

Specializing in investing in early-stage technology startups in Asia, Headline Asia places particular emphasis on emerging markets such as Taiwan, Indonesia, and Vietnam. Their investment strategy primarily targets seed and pre-Series A stage companies that demonstrate strong growth potential.

Joseph Huang, General Partner of Headline Asia, aptly compares the relationship between VCl firms and startups to dating and getting married. Just as couples must adapt and support each other, VCs and startups must find ways

Notable investments:

17LIVE, Taiwan Taxi, Ephod Technology, Pinkoi, Appier, and KKday.

Industry focus:

Software, Financial Services, E-Commerce, Internet, Information Technology.

SparkLabs

Since 2018, SparkLabs has been actively investing in and accelerating over 50 startups through their SparkLabs Taiwan initiative. Their flagship program, "Dream Big Go Global!," is a three-month accelerator designed specifically for seed to early-stage startups. This program offers an array of valuable resources, including personalized 1:1 coaching, access to world-class mentors, business opportunities, and connections to potential investors.

SparkLabs operates as both a startup accelerator and a venture capital fund, with a primary focus on data-driven industries. They specialize in investing in and accelerating early-stage startups, providing essential support such as mentorship, networking opportunities, and access to capital. Additionally, they actively collaborate with corporations to foster innovation and drive the adoption of new technologies.

With their comprehensive support and unwavering dedication to fostering innovation, SparkLabs plays a pivotal role in nurturing and propelling the growth of data-driven startups in Taiwan.

Notable investments:

Just Kitchen, Influexio, FunNow, and MoBagel.

Industry focus:

E-Commerce, Software, Information Technology, and Healthcare. With a specific emphasis on nurturing startups in their early stages, ranging from

Domestic Venture Capitalists

Now, let's take a closer look at some domestic VCs that have made contributions to Taiwan's startup ecosystem. These homegrown investors are key players in fostering innovation and providing essential funding and support to local entrepreneurs. Additionally, some of them actively collaborate with the government to drive growth and advancement in Taiwan. By gaining an understanding of their strategies and focus industries, we can uncover valuable insights into the driving forces propelling Taiwan's entrepreneurial growth, as well as the potential roles these VCs can play beyond Taiwan.

AppWorks

Based in Taipei and founded in 2009 by founders for founders, the AppWorks network is one of the first key players in Taiwan's startup ecosystem. The AppWorks community encompasses three key areas: AppWorks Accelerator, AppWorks Fund, and AppWorks School. The network accompanies startups on their journey, providing support from the seed stage to the growth stage. Currently, their focus is centered around artificial intelligence, Web 3, and the Southeast Asian Market.

The AppWorks School, established in 2016, is dedicated to offering highly practical training for aspiring software developers. Since its inception, the school has achieved an impressive track record, with 90% of its graduates successfully pursuing careers as software engineers. These graduates have joined prestigious Taiwanese startups such as KKBOX, 91APP, Tagtoo, Line TV, UDN Shopping, WeMo Scooter, and Gogoro.

In 2021, AppWorks completed the final closing of AppWorks Fund III, raising US$150 million. Notable investors include Taiwan Mobile, Fubon Life, Wistron, Cathay Life, and Taiwan's National Development Fund. Within their network, they currently have 472 active startups, 1,522 founders, a total of USD$5.4 billion raised, and an overall valuation of USD$31.5 billion.

Notable investments:

KKday, 91App, iCHEF, WeMo Scooter and 17LIVE.

Industry focus:

E-commerce, Blockchain, Software, Cryptocurrency, and Fintech.

TAIWANIA CAPITAL

With its headquarters based in Taiwan and offices in Silicon Valley, Central, and Western Europe, TAIWANIA Capital is a Taiwanese venture capital firm founded in 2017 by the National Development Fund of the Executive Yuan of Taiwan and a group of private enterprises. Its mission is to establish business partnerships globally and stimulate Taiwan's economic growth. TAIWANIA places a strong focus on financial returns, but more importantly, aims to be the bridge between technology and capital.

Since its inception, TAIWANIA has raised a total of NT$25.8 billion in capital spread across six different funds. Their first fund, "Fund I," focused on Industry 4.0 businesses, while the subsequent funds shifted their focus to health-related technologies such as Digital Health, BioTech, and MedTech. The latest funds have expanded their focus to include SaaS, 5G, EV Supply Chain, and Information Security businesses.

In March 2022, TAIWANIA began managing Taiwan's National Development Council's Central and Eastern Europe Investment Fund (the CEE Fund). The CEE Fund was established to allocate funds for investments in Central and Eastern Europe, with the aim of strengthening Taiwan's economic and investment relationships with its democratic allies in Europe. The majority of the fund's investments are expected to be placed in Lithuania, Czechia, and Slovakia.

Notable investments:

17LIVE, 91APP, Dcard, Flow, iCHEF, KKday, OmniChat, and WeMo.

Industry focus:

Healthcare, Medical Devices, Biotechnology, Software, and Manufacturing.

中華開發資本國際
CDIB CAPITAL INTERNATIONAL

Currently managing over USD$1.2 billion in total assets, CDIB Capital was established in 2006 as the private equity arm of China Development Fund (CDF). CDF, with its roots dating back to 1959, emerged as a pioneering force in venture capital, private equity, and investment banking in Taiwan. Over the years, CDF has grown into one of the largest and most esteemed banking groups in the Greater China region, securing its place as Taiwan's foremost financial institution.

CDIB Capital pursues a diverse investment strategy, encompassing mid-market buyouts, private credit, and growth/venture capital across Asian and North American markets. Leveraging its comprehensive financial knowledge, industry expertise, regional presence, and local capabilities, CDIB Capital effectively collaborates with its portfolio partners, aiming to deliver exceptional risk-adjusted returns to all stakeholders involved.

To date, CDF has deployed over USD$2 billion of proprietary capital across more than 300 portfolio companies, spanning diverse markets such as Taiwan, the Greater China region, the Asia Pacific region, and maintaining a presence in New York. While healthcare holds strategic significance as an area of investment, CDIB Capital does not limit itself to specific sectors. Instead, their evaluation criteria focus on factors such as core strengths, growth potential, and competitive advantages when assessing investment opportunities.

Notable investments:

Greenvines, FunNow, Puriblood, Pharmosa Biopharm, Skytech, and Airoha.

Industry focus:

Healthcare, Biotechnology, AI, Information Technology, and E-commerce.

TGVEST

TGVest Capital, a technology-focused private equity fund based in Taiwan, comprises a team of talented professionals with decades of corporate investment experience. Specializing in growth capital and buyout investments, TGVest aims to support its portfolio companies in their transformation and growth journey while generating returns for its stakeholders. Of particular interest to TGVest are investment opportunities that have the potential to strengthen the relationship between Taiwan and Japan.

Driven by the belief that successful tech investments stem from deep industry knowledge and insights, TGVest actively engages in all aspects of its portfolio companies' business management, including strategy, operations, governance, and growth development. By adopting this comprehensive approach, TGVest strives to deliver excellent returns on investments for its esteemed investors.

Notable investments:

Appier, KKday, and TXOne Networks.

Industry focus:

Semiconductor, Non-tech Innovation, Medical Tech and Services, Advanced Manufacturing, and Cloud/Enterprise Data Infrastructure.

hive ventures

Believing in a future where the world is hyper-connected by AI, Hive Ventures sees Taiwan as the potential driving force behind that future. Demonstrating their commitment, Hive Ventures backs their beliefs by actively investing in early-stage teams who aspire to develop the building blocks of a smart hyperconnected future.

In its ongoing efforts to investigate and track industrial trends that align with its future vision, Hive Ventures established the Atlas Index. This index monitors publicly listed companies within its investment scope and compares their performance with renowned indexes like NASDAQ, Dow Jones, and S&P 500. To further explore trends within its investment scope industries, Hive Ventures publishes annual reports on the State of Taiwan Enterprise AI. Additionally, the firm organizes annual Galaxy Summits, facilitating discussions and exploration of the latest trends, case studies, experiences, and successful technology adoption.

Since 2021, Hive Ventures has invested over USD$30 million and secured an additional USD$13.5 million in the June of that year for its seed fund.

Notable investments:

Canner, Profet AI, InfuseAI, Instill AI, and Profet AI

Industry focus:

AI, Healthcare, Machine Learning, Blockchain, and Cloud Data Services.

Investment Opportunities in Taiwan

In this last section, our focus shifts towards highlighting investment opportunities within Taiwan's startup ecosystem, taking into account all the comprehensive information we have provided throughout this report. We begin by exploring three key industries, aligning our choices with the strategic vision of Taiwan's 5+2 Innovative Industries Plans and the 6 Core Strategic Industries. These industries hold substantial growth potential and benefit from a supportive government regulatory framework. Lastly, we present AI as a disruptive technology in the case of Smart Manufacturing, drawing insights from an interview conducted with Hive Ventures.

Overview of Key Industries and Sectors

Biomedicine Technology

Taiwan is renowned for its advanced medical capabilities and its comprehensive National Health Insurance program. According to the "Expat Insider 2022" survey by InterNations, Taiwan secures the top rank in the Health & Well-Being subcategory, leading in all of its factors. This recognition is further supported by the "Numbeo Health Care Index by Country 2022," where Taiwan has consistently claimed the first position among 96 countries for four consecutive years. Recognizing Taiwan's strength in this domain, the government has included the "Biomedicine" industry in its 5+2 innovative industries plan and launched the Biomedical Industry Innovation Program (BIIP) in 2017 to enhance advancements in the biomedical industry and the health and welfare sector for the nation's residents. Collaboration among various ministries, academic institutes, research organizations, and medical institutions has been integral to the program's objectives, which aim to develop 20 new drugs and 80 medical devices for the international market by 2025.

BIIP's efforts to stimulate this industry and streamline operations for biomedical businesses can also be seen by the inauguration of Taiwan's first major biotechnology industry cluster, Nangang Biotech Cluster, in March 2023. This cluster represents Taiwan's first major biotechnology industry cluster and brings together esteemed institutions to create a collaborative ecosystem. Key members of the cluster include Academia Sinica, which contributes to basic research, the National Biotechnology Research Park, focusing on preclinical developments, Taipei Bioinnovation Park, dedicated to research and development as well as production, and the Taiwan Food and Drug Administration CDE, responsible for clinical trial reviews and new drug registrations. By integrating these entities, the Nangang Biotech Cluster aspires to become an all-inclusive destination that caters to the needs of both local and foreign biomedical industry institutions.

Electric and Autonomous Vehicles

Next-generation vehicles, including electric and autonomous vehicles, have become a focal point in Taiwan, with efforts spanning multiple levels.

At the government level, an example of support is the "Unmanned Vehicles Technology Innovative Experimentation Act" by the Ministry of Economic Affairs (MOEA). This act, implemented in 2018, aims to stimulate research, development, and applications of unmanned vehicles (UVTs) by establishing a safe environment for innovative experimentation, industrial technology development, and innovative services. In furtherance of promoting electric vehicles (EVs) and UVTs, the cooperation between the Taoyuan city government, the central government, and Qinwei International Technology led to the establishment of the Hutoushan Innovation Hub in 2018. This hub features a comprehensive 5G Vehicle-to-Everything (V2X) technology and provides R&D testing environments for UVTs, making it an ideal location for industrial, research, and academic institutes to conduct R&D and trials. Additionally, the Asian Railway and Transportation Engineering Center (ARTC) in Taiwan houses an American Association for Laboratory Accreditation (A2LA) accredited electromagnetic compatibility (EMC) laboratory, which offers A2LA-certified EMC test reports for EV and automotive electronic products. With its interdisciplinary cross-sector collaborations, Taiwan has become an ideal destination for research, development, testing, and production of next-generation vehicles.

In recent years, Taiwan has not only developed its own EV companies but also entered the supply chain for major EV brands. Following Mercedes-Benz's core development strategy in 2016, Taiwan's EV development aligns with the Connected-Autonomous-Shared & Services-Electric (CASE) principles. To further promote the growth of the smart EV industry, Taiwan has adopted five main strategies:

- **Promoting cooperation between government agencies for the use of electric buses**
- **Increasing incentives for automobile purchases**
- **Adopting innovative business models**
- **Encouraging business investment**
- **Establishing an industrial value chain**

Recognizing the significance and value of the EV industry, the Taiwan External Trade Development Council (TAITRA) has taken initiatives to foster growth. These efforts include organizing the "2035 E-Mobility Taiwan" exhibition and the distinguished startup competition "Global Demo Day," publishing the EV industry map, and establishing the "Electric Vehicle CEO Academy." These endeavors aim to stimulate and expedite the development of Taiwan's EV industry and reinforce Taiwan's position on the international EV landscape.

Cybersecurity

The field of cybersecurity plays a critical role in national security, public interest, daily life, and economic activities. Taiwan recognizes the importance of enhancing and advancing the cybersecurity industry to bolster the resilience and security of communication networks. In addition to the 5+2 Innovative Industries Plan and the 6 Core Strategic Industries, Taiwan has implemented various initiatives to support the development of the cybersecurity and national defense sectors. Two notable initiatives in this regard are the "Financial Cyber Security Action Plan" and the establishment of the "Taiwan Information Security Association."

The Financial Cyber Security Action Plan, initiated by the Financial Supervisory Commission (FSC) in 2020 and renewed in 2023 with version 2.0, aims to strengthen cybersecurity development, starting with the financial industry. The plan's objective is to ensure the continuous operation of the financial system, providing the public with confidence in a safe and secure trading environment, while enhancing the cybersecurity capabilities of financial service firms. The plan emphasizes cooperation between the private and public sectors, tailored regulations, resource sharing, compliance measures, and international collaborations. Alongside creating a safer digital financial environment, the plan also supports the growth and resilience of Taiwan's financial sector.

The Taiwan Information Security Association (TWISA), established in August 2020, primarily consists of domestic companies specializing in independent research and development of cybersecurity solutions. TWISA is dedicated to maintaining strong industry connections, fostering consensus, and leveraging the collective products and services of its members. The association's objectives include safeguarding Taiwan's cybersecurity industry, supporting members in accessing international markets, and promoting collaboration among the private, public, and academic sectors. TWISA aims to cultivate an innovative and sustainable cybersecurity ecosystem, ultimately positioning Taiwan as a reputable brand in the field.

Innovation Trends Across Industries

Over the past years, Taiwan has emerged as a leader in driving innovation across various sectors. Other than semiconductors, these sectors includes renewable energy, biotechnology, and manufacturing.

In the realm of renewable energy, Taiwan has made significant efforts by investing NT$1 trillion towards renewable projects. The primary objective of these investments is to foster innovation and technological advancements so that by 2025, 20% of Taiwan’s electricity will be generated from renewable sources, reflecting its commitment to a sustainable future.

The biotechnological sector in Taiwan is experiencing growth driven by both the demands of an aging population and governmental initiatives. The inclusion of the "Biomedicine" industry in the 5+2 Innovative Industries Plan and the introduction of the Biomedical Industry Innovation Program in 2017 have been instrumental in propelling advancements in biotechnology. This includes areas such as pharmaceuticals, medical devices, and precision medicine. The BIIP Program aims to develop 20 new drugs and 80 medical devices for the international market by 2025.

Another noteworthy sector that deserves attention is Taiwan's manufacturing sector. As an integral part of the 5+2 innovative industries plan, Taiwan is actively promoting the development of the smart machinery industry. The country envisions itself as a leading high-end manufacturing hub within the Asia Region.

In the following section, we plunge into a comprehensive discussion about the trend of smart manufacturing and AI adoption.

Smart Manufacturing AI Adoption: Hive Ventures Report

Following the second world war, the rise of the Taiwanese economy was kick-started by its manufacturing industry. This allowed the evolution of the Taiwanese economy into a powerhouse of advanced electronics and technology.

According to the Hive Venture's 2022 State of Taiwan Enterprise AI Report, there is a notable and swift integration of AI technologies within the manufacturing sector in Taiwan. This discernible trend signals a prospective revival of Taiwan as a global manufacturing powerhouse, underscoring the pivotal role played by smart manufacturing practices.

Hive Venture's report also found that the impact of Covid-19 has heightened the urgency for AI adoption in Taiwan, approximately 57% of the 270 respondents observed an increase in urgency toward AI adoption. The top five sectors with adoption urgency are the following, Internet & Media, Healthcare, Marketing, Gaming, and Manufacturing. Across all sectors, the top three objectives of AI adoption are to increase organizational efficiency, reduce costs, and increase customer loyalty/experience. Complementing this, the Crunchbase 2023 Q4 VC Funding Report also reveals that the field of Artificial Intelligence (AI) emerges as the frontrunner in terms of growth, with global funding for AI startups reaching nearly $50 billion in the past year—an increase of 9% from the $45.8 billion invested in 2022.

Based on the previous forecast by Hive Venture, it was projected that in 2022, enterprises' AI investment strategy would shift from revenue-generating functions to backend operational functions. While this year's findings align somewhat with the initial forecast, there has been a noticeable increase in focus on functions related to manufacturing, sales, and marketing. This shift can be attributed to the organizational emphasis on enhancing efficiency and reducing costs through AI adoption. In line with the adjustment in function focus for AI adoption, there has been a steady increase in the average number of functions implementing AI within organizations, rising from 1.66 to 1.89. This indicates a gradual expansion of AI adoption across various functions within organizations. It is anticipated that this trend will continue, leading to further growth in function adoption per organization in the coming years. To gain a deeper understanding of this emerging trend, we conducted an interview with Mr. Yan Lee, the founder and managing partner of Hive Ventures, a venture capital firm highly focused on AI. During the interview, Mr. Lee shared insights on what the future may look like with the growing adoption of AI in operations, with a specific emphasis on the manufacturing industry.

Insights from the Interview with Yan Lee, founding partner of Hive Ventures

The Covid-19 pandemic has spurred the intent to digitize industries, particularly manufacturing. Notably, the adoption of corporate AI culture within the manufacturing sector has risen from 50% to 58.21% this year. Traditionally, money was focused on transforming front-end functions such as sales and marketing. However, the recent budget allocation towards manufacturing signifies a spreading trend of AI adoption within companies themselves. This suggests that after prioritizing front-end business units in previous years, the manufacturing industry is now ready to diffuse that capability into the manufacturing unit. Additionally, the surge in manufacturing digitization through AI can be attributed to the tangible results showcased by early adopters, who have demonstrated how AI improves efficiency and reduces costs. As more positive outcomes become evident over the next year or so, it is highly likely that spending in this area will intensify further.

One example of a Taiwanese manufacturer that has adopted AI in its operations and is yielding favorable results in the optoelectronic and panel maker space is the AUO Corporation. AUO has already deployed over 1800 AI models into their manufacturing production. This deployment has resulted in significant performance improvements across areas where AI was implemented. The positive outcomes were so remarkable that AUO made the strategic decision to establish independent business units aimed at exporting these capabilities to other players within the optoelectronic and panel-making sectors, as well as its supply chains and the vertical itself. Being an early adopter, AUO has experienced remarkable performance enhancements and is now spreading these benefits throughout the entire value chain.

Key factors driving AI adoption for smart manufacturing

1. Labor Shortage Caused by Low Reproduction Rate

Taiwan has the lowest reproduction rate in the world, resulting from the decline of the younger population's willingness to participate in manufacturing and traditional businesses. Consequently, Taiwan has been endeavoring to address this gap by relying more on foreign workers. However, a significant challenge arises from the time required to train these individuals. In contrast, leveraging AI presents a more viable option for inheriting many of these capabilities efficiently.

2. Challenges in Handover During Succession

In Taiwan, there is a cultural concept known as "二代接班" (Er Dai Jie Ban), where business owners hand over their businesses to the younger generation. However, when it comes to factory lines, a key figure known as "老師傅" (Lao Shi Fu) holds significant importance. "Lao Shi Fu" translates to "master" or "veteran" These experienced individuals possess exceptional knowledge and skills. They can anticipate machine failures merely by listening to their sounds and intuitively set parameters and configurations for specific processes without relying on mathematical calculations. They play a crucial role in ensuring the efficiency of operations and factories in Taiwan.

3. Global Geopolitics Climate Leading to Manufacturing Decentralization

In the current geopolitical climate, many companies, including small and medium-sized businesses, are compelled to decentralize their manufacturing operations. In the past, these businesses would establish their factories in China, but due to various geopolitical factors, they are now being forced to relocate their facilities to the United States, Japan, and Europe. This shift towards decentralization has significant implications. Traditionally, products were produced in one or two factories within a company. However, with the new paradigm, these products will need to be manufactured across multiple factories located in different countries simultaneously. This poses a challenge, as there is already a shortage of experienced veterans who can effectively manage these factories, while junior personnel have not had sufficient time to acquire the necessary expertise to export these capabilities. Consequently, scaling operations across a more decentralized supply chain becomes a pressing issue for these manufacturers. To address this challenge, the introduction of AI can be a viable solution. AI can effectively inherit the capabilities, knowledge, and standard operating procedures of these experienced veterans and swiftly scale operations on a global level. By replicating the expertise of these veterans in new facilities worldwide, AI ensures consistent production quality and helps manufacturers navigate the complexities of a decentralized supply chain.

Final Thoughts: The Influence of AI Adoption on the Labor Market

A 2018 study by Lee, et al. suggests that every industrial revolution is accompanied by the creation of better quality jobs; the fourth industrial revolution will slowly eliminate the repetitive manual labor required in traditional factories and create better job opportunities. Processes that can be digitized and automated will be embedded into smart machines, and codified knowledge or codifiable knowledge-based jobs will be performed by robots. As a result, manual routine-based jobs will perish, and the functions of laborers within organizations will increasingly shift toward areas such as auditing activities, innovation, and critical thinking.

Mr. Yan Lee, representing Hive Ventures, concurs with this research and expounds on it using an analogy drawn from the 2016 film "Hidden Figures." In the context of the movie, upon the integration of technology into their operations, rather than facing the dissolution of their team, the members undertook the initiative of self-teaching programming skills, subsequently leading to career advancements.

Conclusion

Taiwan's journey from the "made in Taiwan" era and its dominance in the semiconductor industry has laid a strong foundation for its current startup ecosystem. The country's strategic location, advanced infrastructures, and skilled talent pool with a strong inclination towards innovation have played a pivotal role. Recognizing the need to diversify its economy, Taiwan took proactive measures to stimulate and build up its startup ecosystem.

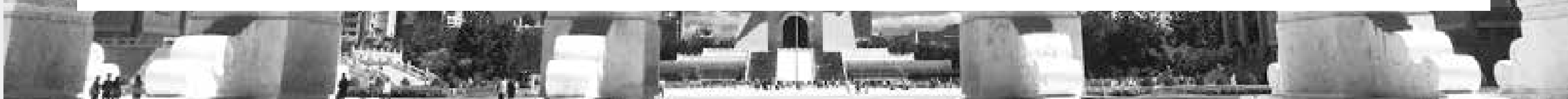
Throughout the years, Taiwan has witnessed the establishment and inflow of numerous organizations dedicated to supporting startups, including startup hubs and venture capitals. Notably, the Startup Business Angel Investment Program, introduced by the NDF and managed by the NDC, has showcased the success of government support in bringing together public and private sectors to invest in startup growth.

Collaborative efforts among the public, government, and venture capital firms have been instrumental in cultivating Taiwan's startup ecosystem, as shown by our report of major startup hubs and venture capital firms, both local and international within Taiwan. The country's commitment and perseverance in developing this ecosystem are evident, with its impact spreading across all regions of Taiwan and attracting a diverse range of investors and entrepreneurs worldwide.

Taiwan's dedication to nurturing the startup ecosystem aligns with its long-term vision and commitment to fostering innovation and entrepreneurship. The introduction of the 5+2 Innovative Industries plan and the 6 Core Strategic Industries highlights Taiwan's commitment to transforming into a new commercial model centered around high-value-added businesses, services, and solutions. Therefore, looking ahead, it is safe to say that the country will continue implementing proactive measures tailored to its specific agenda and needs, demonstrating unwavering determination to support startups and drive their growth.

In our discussion of potential investment opportunities, we highlight a few industries that are hugely supported by government initiatives and their future directions. Moreover, we also shed light on why manufacturing companies in Taiwan are rapidly embracing AI to enhance their operations, according to the Hive Ventures Report and the subsequent interview. These emerging trends present significant opportunities for investments and innovation in Taiwan's startup ecosystem.

Overall, Taiwan's remarkable journey, combined with its commitment to supporting startups, establishes it as a dynamic and attractive destination for entrepreneurs and investors. The country is set for continued growth and success in its thriving startup ecosystem. As the country embraces innovative technologies and explores new avenues for innovation, it will unlock even more opportunities for investment and contribute to its economic diversification. In summary, the holistic impact of these efforts will contribute to the country's overall growth and prosperity, prompting the question: could we be on a path in creating the Taiwan Miracle 2.0?



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