

Chinese Foreign Direct Investment in Euro-Tech

Trends & Tendencies, Investor Risk Profiles, Key Strategic Issues for Government Policy

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Executive Summary

- **Despite media reporting and arguments made by China hawks, there is no “collective brain” in China that is coordinating the overseas investment activities of public or private companies involved in the production of products and services reliant on advanced or emerging technologies.**
- **Commercial objectives take precedence in the behaviour of private Chinese companies operating overseas, whereas investments from state-backed companies fall squarely into the pot of strategic objectives outlined by the Chinese Communist Party in their industrial strategy, Made in China 2025.** Acquisition in the semiconductor industry, as is quickly becoming a recurrent theme, is connected to historical shortcomings in domestic production prowess and in more recent times the need to secure supply due to restrictions imposed by trade tensions with the US.
- **There is a clear trend towards absolute ownership among all investor types, both public and private.** Such a preference is a result of Chinese investors’ now relatively extensive experience in overseas investing. Of 505 “non-control” investments examined by Andrew Collier, only 34% were considered successful post-investment. The success rate rose to 45% where investors were able to gain a controlling stake.

- **Chinese investors operating in the global technology sphere are largely adhering to mainstream global standards.** The global integration of China's domestic technology ecosystem into the global one and inversely, the world's technology ecosystem being integrated into China, will necessarily expand their involvement in standard-setting or, ultimately, their deviation from global norms.
- **Embracing the EU-China Comprehensive Agreement on Investment (CAI) presents new possibilities.** The recent agreement between the EU and China on investment has received tempered support from observers and stakeholders. Although this is far from a comprehensive trade deal, it does place in writing a shared commitment to increased market access in a range of areas, safeguards against forced technology transfers and the establishment of a dispute resolution mechanism.
- **Creating a comprehensive investment screening mechanism and a framework for analysing the competitive effect of Chinese companies is a worthy priority.** The Netherlands in this regard benefits from an array of templates to borrow from. Complementary to an investment screening template would be a framework for measuring the competitive effect of Chinese investment on Dutch tech companies - or any other company - within the Dutch economy itself and worldwide.

Introduction

Since 2009, European companies have received approximately €160 Billion in investment from China.¹ This aggressive wave of Chinese outward-bound foreign direct investment (“COFDI”) is the primary practical manifestation of the Chinese Communist Party’s (CCP) 2001 “go global” policy. Such is the significance of this phenomenon, that it has received scrutiny from a variety of observers in academia, business, media and policy circles.

As the call from the CCP to go global was dutifully adopted by state-backed enterprises from China and wilfully embraced by burgeoning private enterprises, the industrial policies set by the Chinese government have continued to evolve in sync with China’s domestic economy. The *Made in China 2025* (MiC25) strategy is the cornerstone of China’s industrial policy as it seeks to transition from low-tech manufacturing to a market-leading manufacturer in advanced technologies.

President Xi’s signature project, MiC25, identifies ten core industries ranging from robotics and cloud computing to semiconductors and artificial intelligence in which China aspires to become *the* global leader in advanced manufacturing and a “cyber” and “science and technology innovation superpower”.² Although the rhetoric around MiC25 has largely been dropped in recent times as a strategic attempt to assuage foreign observers, the underlying work involved in executing the project continues apace. This strategy is geared towards becoming a self-sufficient, net exporter of global technological innovation and associated products.

At its core, the MiC25 industrial policy is designed as a road map to elevate China’s position in global technology value chain to one of international predominance. The McKinsey Global Institute (MGI) has provided an instructive framework for understanding the key elements in achieving this goal. There are four key elements required to successfully move up the global technology value chain, namely:

1. *Investment at scale* - an abundance of financial resources including state-held foreign currency reserves; access to cheap financing products and long-term debt facilities for private and state-owned companies; and government subsidies for companies operating in strategic industries.
2. *The acquisition of technological “know-how”* - the capacity to purchase patents on license or outright; entering into joint-ventures with foreign competitors to “learn by doing”; M&A activity to acquire “hard” intellectual property, the “soft” expertise of personnel, and create synergies between R&D departments.
3. *The ability to create access to new, large markets* - M&A platform acquisitions to access foreign markets and open the door for other home-grown enterprises to gain that same access; incentives for domestic consumers provided through digital infrastructure and the removal of barriers to the import of foreign technology and products.

¹ Agatha Kratz, Mikko Huotari, Thilo Hanemann, and Rebecca Arcesati, ‘Chinese FDI in Europe: 2019 Update’, *MERICCS*, April (2020), p. 9.

² Max J. Zenglein and Anna Holzmann, ‘Evolving Made in China 2025: China’s Industrial Policy in the Quest for Global Tech Leadership’, *MERICCS*, no. 8, July (2019), p. 8.

4. *An effective system to encourage competition and innovation* - the creation of an environment with limited state intervention, central planning or the contravention of technological disruption and innovative ideas.³

Both public and private Chinese stakeholders are working towards achieving the MiC25's objectives. These endeavours are not always successful, nor are they coordinated from on-high. There are clear overlaps, discrepancies and at times contradictions in the pursuit of Chinese technological aspirations. The actors in this play, state-owned or private, are not guided nor driven by a "collective brain". This needs to be remembered when examining China's growing footprint in the global technology value chain.⁴ Nonetheless, there is great interest in acquiring technology companies. "Euro-Tech", as it is called here, refers to enterprises working with advanced or emerging technologies that are native to the European continent as well as the United Kingdom.

To make sense of COFDI in Euro-Tech, this report turns first to the trends and tendencies observed in the behaviour of not only Chinese investors but also the behaviour of European suitors to investment and the general reception of Chinese interest in the sector. This section focuses on the distribution of investment flows by technological sub-sectors followed by a similar appraisal of the level of control exercised by Chinese investors.

The second section of the report examines the risk profiles of different types of Chinese investors. These include state-owned enterprises (SOEs), state-powered private companies (SPPs), and outright private companies - fondly known as "China's Disruptors" by some.⁵ Each profile details a *précis* of the investor types historical development and a statement on their present objectives. Key issues pertaining to their ultimate beneficial ownership (UBO) and typical financing mix will also be explained. This is supplemented by transaction case studies for each risk profile - covering the profile of the target asset and its investor, along with the terms of the deal and evidence of synergies.

The final section guides our attention to the possibilities and limitations this phenomenon presents to European governments in terms of policy options. This is achieved by identifying key strategic issues. They include: the impact of EU-China Comprehensive Agreement on Investment (CAI); the Netherlands own global value chain aspirations; the importance of an investment screening mechanism and a framework to measure the competitive effects of Chinese Investors on the Dutch Economy.

³ McKinsey Global Institute, 'China and the World: Inside the dynamics of a changing relationship', July (2019), p. 68.

⁴ Paul Gao, David Cogman, and Nick Leung, *Making Sense of Chinese Outbound M&A* (Beijing: McKinsey & Co, 2017), p. 2.

⁵ See Edward Tse, *China's Disruptors: How Alibaba, Xiaomi, Tencent and Other Companies are changing the Rules of Business* (London: Penguin, 2016).

Trends in Chinese Investment Flows to Euro-Tech

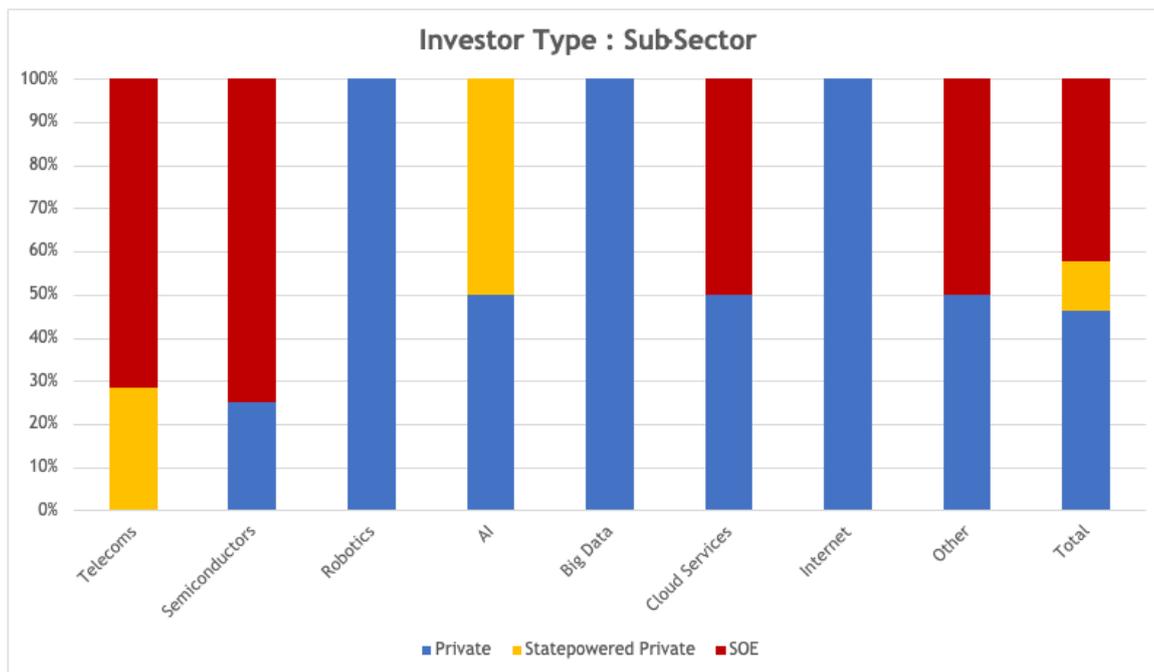


Figure 1 - Distribution of Investor Types Across Technologies
Source: American Enterprise Institute Global Investment Tracker

Figure 1 illustrates the distribution of invested capital by the respective investor types. In the case of privately owned Chinese companies, the sectoral distribution of investments is especially broad, encompassing seven of the eight sub-sectors listed. The SOEs and SPPs, by contrast, are much more targeted in their purchases. Both have a heavy emphasis on telecoms. SOEs invested in a significant spread of semiconductor companies and cloud computing. Meanwhile, SPPs invested exclusively in artificial intelligence besides telecoms. Prominent examples featured in this study include NXP Voice and Audio Solutions, now Nxpertia, who supply components and license patents to almost every electronic design in the world spanning automotive and 5G to consumer products and cloud computing services. Similarly prominent is Imagination Technologies, whose artificial intelligence products are licensed to Apple.

The variation in target assets reflects the general observation that commercial objectives take precedence in the behaviour of private Chinese companies operating overseas.⁶ This is emphasised in *Appendix #2* where the EU market access is a factor in at least 50% of the acquisitions or investments in the European technology sector made by private companies.

The investments of the state-related companies, on the other hand, fall squarely into the pot of strategic objectives outlined by the CCP in their industrial strategy, Made in China

⁶ Luís Pedro Moço Da Costa Santos, 'The Strategic Implications of the Chinese Foreign Direct Investment in Portugal (Conference Paper)', *Instituto de Estudos Políticos da Universidade Católica Portuguesa*, Mafra, February (2020), pp. 8-9.

2025, as detailed in the introduction to this report. Acquisition in the semiconductor industry, as is quickly becoming a recurrent theme, is connected to historical shortcomings in domestic production prowess and in more recent times the need to secure supply due to restrictions imposed by trade tensions with the US.⁷

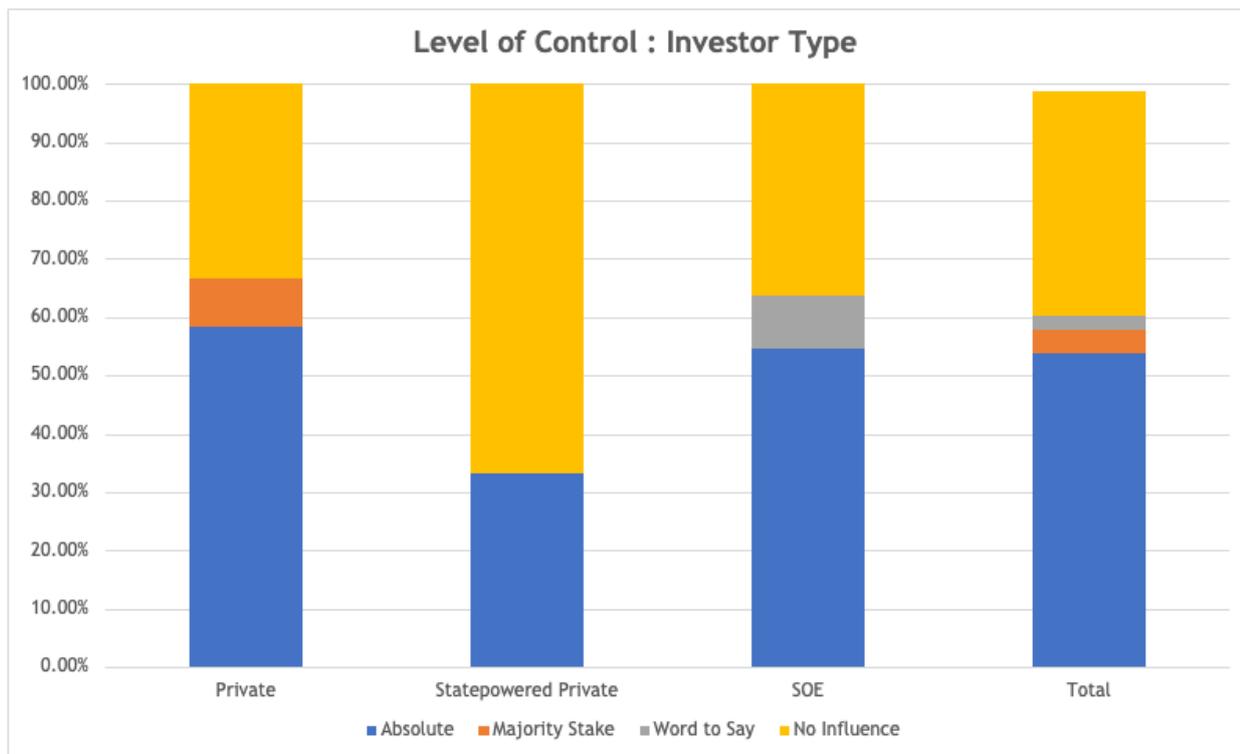


Figure 2 - Level of Control Exerted by Investor Types in Completed Acquisitions
Source: American Enterprise Institute Global Investment Tracker

Fig. 2 outlines the level of control exercised by respective investor types. For clarity, there are four categories of control: “absolute control” (61% of total equity); “control” (~30% of total); “a word to say” (9% of total); and “no control” (<9% of total).⁸ There is a clear trend towards absolute ownership across all three investor types identified by this study. Such a preference is a result of Chinese investors now relatively extensive experience in overseas investing. Of 505 “non-control” investments examined by Andrew Collier, only 34% were considered successful post-investment. The success rate rose to 45% where investors were able to gain a controlling stake.⁹

The one anomaly in the table above concerns SPPs and a significant proportion of investment capital that offers no influence over the daily operations of their acquisitions. These investments were high-value minority stakes (no more than 2% apiece) in Prysiam and Telecom Italia. Similar investments were made by telecoms SOE, Unicom, in Spanish giant Telefonica for again, only 2% equity. The investments were made at considerable expense:

⁷ Jan-Peter Kleinhans, ‘Geopolitics of the Global Semiconductor Value Chain’, *Directions: Cyber Digital Europe*, October 19th, 2020, accessed February 20th, 2021 - <https://directionsblog.eu/geopolitics-of-the-global-semiconductor-value-chain/>.

⁸ Santos, ‘The Strategic Implications of the Chinese Foreign Direct Investment’, pp. 22-23.

⁹ Andrew Collier, *China Buys the World: Analysing China’s Overseas Investments* (Singapore: Palgrave Macmillan, 2018), p. 83.

Prysiam and Telecom Italia investments having a combined value of \$620m. The Telefonica stake cost \$1.5Bn (*See Appendix #1*).

Given the relative size of the latter investments vis-à-vis the equity stake acquired in return, we can be reasonably confident that they represent the transfer of assets offshore from China - this is especially likely in the case of the SPPs who largely operate as special purpose investment vehicles for exactly these types of operation. This trend is driven by the increasing need for capital to be managed by investment professionals rather than party apparatchiks in order to avoid substantial financial losses. That said, offshoring of assets is an ongoing cause of anxiety for the Chinese State Council who affiliate the phenomenon with the depletion of the country's FX reserves in USD as well as lingering corruption amongst party officials and investment managers. Such investments are relatively benign from a European perspective.

Tendencies of Chinese Investors and European Suitors

Chinese Investors

As the previous section made apparent, Chinese investors of all creeds have a clear preference for majority control of Euro-Tech companies that they invest in. This is very much an “all or nothing” acquisition strategy on their part. Whether their objectives are informed by commercial pressures or characterised by the strategic goals of the CCP, there are obvious advantages to be gained from outright ownership of target assets.

Yet the outright ownership of target assets has not subsequently signalled behaviour typically associated with a “corporate raider” mentality. There is no demonstrable preference for dismantling companies for parts, or stripping an asset of its IP and onshoring that knowledge capital back to China. Rather, the integration of target assets into a broader, global technology ecosystem - admittedly with Chinese vendors at the centre - is emerging (something which will be examined in closer detail by the case study acquisitions to follow). For the most part, the general integrity of target assets has been maintained with a large degree of autonomy too. The scant evidence to suggest investors are “calling the shots” reaffirms the absence of central coordination of overseas investment activities deriving from the State Council in Beijing.

European Suitors

European companies, for their part, are primarily concerned with the commercial opportunities Chinese investment presents. A Chinese “partner” is generally the easiest means by which Euro-Tech, or any foreign company for that matter, can enter the Chinese domestic market with its vast consumer potential. Market share is a key consideration for many of Europe’s technology companies who face equally fierce competition from US firms who boast their own considerable size and market presence. Access to a relatively closed market like that of China’s, therefore, is a competitive boon for Euro-Tech.

Conversely, Chinese investors have proven to be reliable source of ready capital for larger companies such as NXP Semiconductors who have been able to use Chinese interest to divest assets as they realign their corporate strategy to shift in other directions. This was the case in the sale of their RF Power Units division, which opened the door to purchase Freescale - a move that would have otherwise been prohibited by the US mergers authorities.¹⁰ NXP CEO, Richard Clemmer, captured the business calculation in the company press release:

“JAC Capital's ability to support continued growth and development of the business and its ability to sign and close a transaction rapidly was a key factor in enabling the best outcome for our customers and shareholders, as well as supporting the closure of the merger with Freescale Semiconductor”¹¹

¹⁰ Liana B. Baker, and Greg Roumeliotis, ‘Qualcomm says China comment will not revive NXP deal’, *Thomson Reuters*, December 3rd 2018, accessed December 30th 2019 - <https://www.reuters.com/article/us-nxp-semicondtrs-m-a-qualcomm/qualcomm-says-china-comment-will-not-revive-nxp-deal-idUSKBN1O20BG>; ‘NXP Closes Deal to Buy Freescale and Create Top Auto Chipmaker’, *CNBC*, December 7th 2015, accessed December 30th 2019 - <https://www.cnn.com/2015/12/07/nxp-closes-deal-to-buy-freescale-and-create-top-auto-chipmaker.html>.

¹¹ ‘Press Release: NXP Semiconductors Announces Agreement to Sell RF Power Business’, *NXP Semiconductors*, May 28th 2015, accessed January 3rd 2020 - <https://media.nxp.com/news-releases/news-release-details/nxp-semiconductors-announces-agreement-sell-rf-power-business>.

“Doing business” on mutually beneficial acquisitions also added the advantage of establishing lasting relationships with investors, as yet another way to achieve market access through joint ventures in China.

For companies in more dire circumstances, Chinese investors have also offered the refuge of refinancing. The latter have often come ready with the financial resources to not only acquire a company for its intrinsic value but equally any debts that may have become unsustainable. UK business, Imagination Technologies (*See Case Study*), was not in that precise position but their choice of investment partners was undoubtedly chosen with the company’s long-term health in mind.

Maintaining Global Technological Standards

Chinese investors operating in the global technology sphere are largely adhering to mainstream global standards. The McKinsey Global Institute (MGI) analysed 81 technologies utilised by 11 service and manufacturing industries, comparing the mainstream application of these technologies in China with the rest of the world and found that in more than 90% of cases, they adhered to global standards.¹² MGI also estimate that 20-40% of manufacturing processes in China's technology ecosystem still require the input of foreign multinationals in terms of knowledge capital and high-tech components.

Chinese companies are also making a considerable contribution to global standard-setting in a range of emerging advanced technologies - particularly in the realm of AI, quantum computing and especially 5G infrastructure. Presently 10% of all patents held on 5G technology were filed by Chinese firms.¹³ Facts like this translate into Chinese enterprise being at the cutting-edge of advanced technologies that will change the world and how we perceive and interact with it - their role in how standards are set will consequently be notable. This stands in stark contrast to the early process of standard-setting for the internet and the worldwide web in the 1980s and 1990s at a time when China only had 0.005% of the population using the internet in 1995.¹⁴ China is no longer a mere recipient of technology standards but an active contributor to their formulation.

The global integration of China's domestic technology ecosystem into the global one - in part through overseas expansion examined here - and inversely, the world's technology ecosystem being integrated into China, will necessarily extend their involvement in standard-setting or, ultimately, their deviation from global norms.

¹² McKinsey Global Institute, 'China and the World', p. 66.

¹³ Ibid, p. 66.

¹⁴ World Bank, 'Individuals using the Internet (% of population) - China', *International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database*, accessed February 20th, 2021 - <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=CN>.

“Push and Pull” Factors in the development of COFDI in Euro-Tech

		Rise Until 2017	Decline 2018-2020
The “Push” from China	Economic-Commercial	<ul style="list-style-type: none"> Acquisition of advanced technology and intellectual property. Accession of management expertise and personnel. Access to European Markets and Integration into global technology value chains/global technology-ecosystem. 	<ul style="list-style-type: none"> Implementation of Capital Controls complicating approval for overseas investment (for state & non-state owned firms). Gradual close of extraction mechanisms for private capital to leave China (Asset Transfers). Shifting international business environment impacted by US-China Trade War & Economic Impact of the Covid-19 Pandemic. Drive towards domestication of high-tech manufacturing.
	Political	<ul style="list-style-type: none"> Continuation of longstanding “go global” policy encouraging overseas expansion and the internationalisation of Chinese “National Champions”. The evolution of the Chinese Domestic Economy characterised by objectives of the “Made in China 2025” plan; heavy technological focus. 	<ul style="list-style-type: none"> Precipitous decline of Chinese FX USD reserves from \$4Tr to \$3Tr between 2013 and 2018. Government fears associated with capital flight of private wealth. Recalibration of government industrial strategy focused on fewer, more strategic acquisitions in key sub-sectors such as the semiconductor industry.
The “Pull” from the EU	Economic-Commercial	<ul style="list-style-type: none"> Overriding desire for access to Chinese Domestic Market. Strategic Divestments in the process of realignment within the global technology ecosystem. Ready availability of international investors from China. 	<ul style="list-style-type: none"> Retrenchment of European companies due to shared pressures in the international business environment. Balancing Asian Market aspirations against North American interests in the context of US-China Trade War - “The Sanctions Threat”.
	Political	<ul style="list-style-type: none"> Desire for the expansion of the digital economy and enhancement of European enterprise in advanced technological manufacturing & innovation. General strategy more concerned with opening Chinese markets to European companies than to limit Chinese FDI in the EU. 	<ul style="list-style-type: none"> Introduction of EU Commission Investment Screening data-sharing mechanism. Development of more rigorous investment screening practices amongst member states & the UK. Hawkish views on China in the print media and policy circles: pressure from the US. Prominent cases of corporate espionage (e.g. ASML IP Theft, April 2019).

Risk Profiles – Investor Types

State-Owned Enterprises (SOEs)

SOEs are organisations that originally underpinned the CCP's adoption of the Soviet Central Planning Model for the domestic economy during the 1950s. Today they remain closely tied to the government by way of official ownership and are geared towards the key strategic objectives of the CCP at national and local levels in accordance with industrial policy. Prominent examples of SOEs include COSCO (the owners of the Piraeus Port in Greece), FOSUN and a host of construction companies such as the China Railway Engineering Corporation.

When they were originally conceived, the system into which they were incorporated was characterised by an opaque, top-down approach to production governed by party bureaucrats who allocated resources and directed factory output. In many cases, the managers of factories were not even officially permitted direct contact with their suppliers, such was the strength of the hierarchical governance structure. Little emphasis was placed on product quality, innovation or entrepreneurship and the opacity of system encouraged informal back-channelling between suppliers and producers - coupled with price fixing by party officials and strict adherence to centrally managed production targets rather than efficiency, corruption and managed market distortions became the norm. The latter points must be kept in mind when interpreting investor behaviour as they have a half-life that remains visible today in business transactions and interaction with government authorities in China.

Under the guidance of Deng Xiaoping during the “opening up and reform” period, SOEs were granted greater latitude to negotiate their own contracts and improve operational performance. The adherence to arbitrary production targets were replaced with a more agile approach to production. They were also allowed to retain a portion of their profits to reinvest in research and development (R&D) and overseas purchases. Since the advent of China's “go global” policy in the early 2000s, SOEs have invested aggressively around the world as well as tendering for a host of foreign construction contracts.

Ownership of JAC Capital

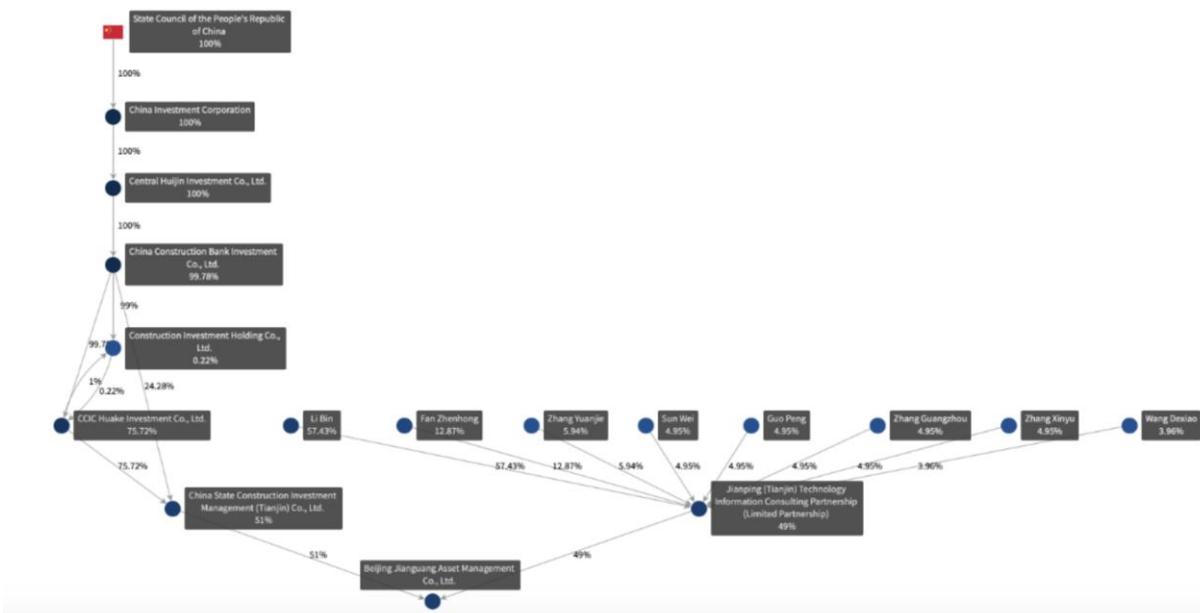


Figure 3 - Ultimate Beneficial Ownership Web, JAC Capital
Source: Datenna

Financing Mix

As SOEs have grown and expanded in recent decades, their capitalisation has derived almost entirely from debt. When Andrew Collier reviewed the finances of five SOEs in 2016, he found that they collectively held roughly \$106Bn of debt on their balance sheets. When compared to non-Chinese firms making overseas transactions, their net debt/equity ratios were also an entire decile higher - sporting a 30.2% ratio by contrast to the 19.2% average for international competitors in M&A activity.¹⁵

At first glance one would rightly be concerned by the level of debt accumulation amongst Chinese investors who are acquiring foreign assets at such a brisk pace. Indeed, debt levels in China - collectively - have reached astonishing levels in the last five years: by 2018, it was estimated that total debt held in China was 329% of GDP.¹⁶ In the case of SOEs, however, their primary creditors have been Beijing's state policy banks - particularly the China Development Bank (CDB) and the China Investment Corporation (CIC). This means that the solvency of SOEs is in effect guaranteed by the Chinese government, which seemingly mitigates the debt threat, or its sustainability provided the CCP remains in power. The connection between SOEs and the CCP is illustrated in the ultimate beneficial ownership (UBO) web in Fig. 3 that shows how state-backed investment funds essentially always lead back to the State Council, albeit through several layers of state-owned intermediaries.

¹⁵ Andrew Collier, *China Buys the World: Analysing China's Overseas Investments* (Singapore: Palgrave Macmillan, 2018), p. 82.

¹⁶ George Magnus, *Red Flags: Why Xi's China is in Jeopardy* (London: Yale University Press, 2019), p. 174.

Case Study – NXP RF Power Units (Ampleon) Acquisition 2015

Target Asset: RF Power Units (Ampleon) was a division of parent company, NXP Semiconductors, specialising in the manufacture of products and components for mobile broadband infrastructure, particle accelerators as well as video and radio signal equipment. It is estimated that their semiconductor chips process 50% of mobile conversations globally.¹⁷ Their computer chips are also used in a range of military equipment - they can be found in radar systems (some employed by the Dutch navy), field-communications hardware and electronic countermeasures for aerospace and defence.

Investor: Jianguang Asset Management (JAC Capital) is a state-owned investment fund, albeit through a layer of four entities tracing back to China's Sovereign Wealth Fund, China Investment Corporation (CIC). JAC Capital has a specific mandate that focuses its investment portfolio on the semiconductor manufacture and affiliated industries; their portfolio at one time including another subsidiary of NXP, Nexperia. They have equally entered into a JV with NXP, known as WeEn, in China.

For the Ampleon acquisition, they partnered with specialist consultancy and private equity fund, Wise Road Capital - also native to China. Wise Road comprises its partners from former government investment analysts and experts in science and information technology.

Terms of the Deal: The acquisition was concluded with JAC Capital agreeing to pay €1.67Bn for a 77% stake in what would become Ampleon, the remaining equity being owned by the China Wealth Fund II - an offshore special purpose vehicle (SPV) in the Cayman Islands, owned by Wise Road Capital.

All the RF Power Units Division's activities were transferred to a new, separate company structure in the Netherlands which assumed the Ampleon name, along with its 2000 employees and the entire management team. Included in this transfer of assets was all relevant intellectual property and existing patents as well as a back-end manufacturing operation in the Philippines.

Evidence of Synergies: Ampleon's post-acquisition activity has not been characterised by new partnerships. They do supply components to Huawei and ZTE for their 5G infrastructure but Ampleon also supply the two Chinese telecoms giants' main competitors, Ericsson and Nokia.

There is a clear preference to drive growth through further entrance and integration into Asian and Chinese markets. Since Ampleon was formed as an independent company, the two significant additions to the management team have been David

¹⁷ 'The Acquisition of Ampleon', *Datenna*, accessed February 2nd, 2021 - <https://www.datenna.com/the-acquisition-of-the-nxp-power-division/>.

Sun as Chief Operating Officer and Dr Wei Li as Head of Sales. Both men have extensive experience operating in Asian markets for Ampleon's products.¹⁸

Ampleon also has no less than five strategic distributors of their products in China's domestic market rather than a direct presence, indicating once again the benefits of Chinese investment opening doors. This strategic imperative was stated explicitly by CEO, Reinier Beltman, when discussing JAC's investment in the company, stating:

"The traditional RF power markets have ... shown single digit growth with cyclic patterns. The emerging market of RF energy can turn the overall RF power market into a growth market, an attractive element for JAC ... To a large extent, the base technologies, both front-end and back-end, can be leveraged across the traditional and emerging businesses. These synergies make the entrance into these markets so attractive".¹⁹

Beltman's remarks are a case in point example of the commercial rationale taking precedence for European Suitors and, in part, the efforts of investors like JAC Capital to identify markets with strong growth potential as well as strong technological profile.

State-Powered Private Enterprises

"State-Powered" private enterprises (SPPs) are an object of ambiguity and obfuscation in the Chinese corporate world. Confusion surrounding these organisations is largely related to the question of company ownership, who exerts control over their activities and their source of finance - as shown in Fig. 4. Company structures range from a mixture of SPVs for active overseas investment, offshore holding companies and domestic equity investment funds.

Well-known examples include Canyon Bridge, the offshore equity fund that purchased Imagination Technologies in 2017. Another is the HNA Group - a conglomerate built initially from a domestic airline that in 2015 went on a \$40bn "buying binge" in assets worldwide.²⁰ This is a prime example of the kind of spending the State Council has subsequently moved to curb. The group has since imploded, filing for bankruptcy and debt restructuring in early 2021 (between 2018 and 2019, HNA Group was due to repay \$20bn of the \$120bn its debts alone).

A proliferation of these companies were brought into existence in the past five years following a damning audit of China's Policy Banks and their management of assets, from which it emerged that CIC had made 12 loss-making overseas investments due to a 'dereliction of duty, inadequate due diligence, [and] a lack of post-investment

¹⁸ 'Management Team', *Ampleon*, accessed February 2nd, 2021 - <https://www.ampleon.com/about/management-team.html>.

¹⁹ 'Executive Interview: Reinier Beltman, CEO of Ampleon', *Microwave Journal*, February 1st 2016, accessed February 2nd 2021 - <https://www.microwavejournal.com/articles/25858-executive-interview-reinier-beltman-ceo-of-ampleon>.

²⁰ 'China Plans Sale of HNA's Non-Aviation Assets via Trust', *Bloomberg*, January 21st 2021, accessed January 21st 2021 - <https://www.bloomberg.com/news/articles/2021-01-29/china-said-to-plan-sale-of-hna-s-non-aviation-assets-via-a-trust>.

management'.²¹ As a result, a number of the SPPs engaging in overseas FDI are subsidiaries of organisations that are exclusively owned by the Chinese government. The beneficial ownership structure detailed below, however, illustrates the degree of separation that exists in decision-making between the CCP and the executives managing these enterprises. This in some ways mirrors the autonomy that was dealt to SOEs as they drove towards modernisation.

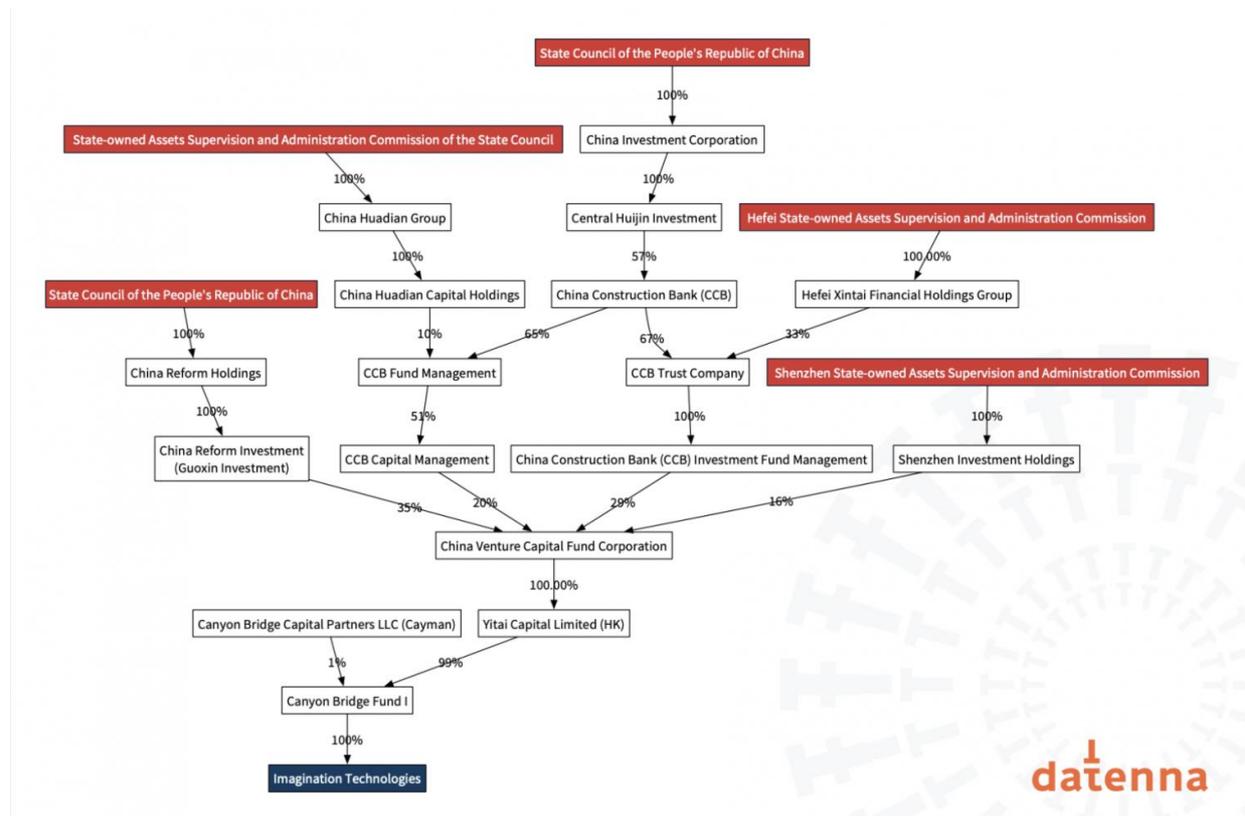


Figure 4 - Ultimate Beneficial Ownership Web, Canyon Bridge & Imagination Technologies
Source: Datenna

Financing Mix

SPPs have received financing from the Chinese government via policy banks but also through direct equity funding from national and local authorities. There are also a number of SPPs that are publicly listed and thus enjoy the ability to raise funds for expansion and investment from international capital markets in both bonds and shares.

SPPs are also known to benefit from sources of “shadow banking”. Two institutions provided said financing: banks in the business of selling wealth-management products and trust companies, often offshore, pooling funds together from investors and acting like a quasi-bank for companies. The “shadow” term derived from the fact that these institutions were behaving like banks only outside the regulatory parameters

²¹ Collier, *China Buys the World*, p. 86.

for banks themselves.²² From a risk perspective, this poses two questions: in terms of transparency, *can we be confident that financing is sourced legitimately? What would be the political ramifications if a sanctioned acquisition were found to be financed by the Chinese state in a clandestine fashion?*

Case Study – Imagination Technologies Acquisition 2017

Target Asset: Imagination Technologies (Imgtec) was founded in 1985. They develop and license silicon and software intellectual property for ‘system-on-chip devices’ that serve ‘mobile, consumer, automotive, enterprise, infrastructure, IoT and embedded electronics’ products.²³

Investor: Canyon Bridge is now described on Imgtec’s website as a ‘Silicon Valley-based private equity firm’.²⁴ Established in 2016, their investment personnel ‘combine a focus on Asian technology and financial markets with a deep understanding of the challenges facing US and other Western tech companies’.²⁵ Despite Canyon Bridge’s branding, they are in fact a subsidiary of a Chinese SOE, China Reform Holdings.

Though they continue to market themselves as a Silicon Valley outfit, the registered office of the company is in Beijing. Its leadership team is a triumvirate of its founding partners: Ray Bingham, Peter Kuo and John Kao who share experience in the semiconductor industry, investment banking and corporate law. As mentioned, their involvement in COFDI to-date is dominated by their acquisition of Imgtec.

Terms of the Deal: Canyon Bridge agreed to acquire all of Imgtec’s stock at price of 182p per share, the equivalent of £550 million (\$740 million) - paving the way for Imgtec’s delisting from the London Stock Exchange (LSX) and return to a private company structure.²⁶

Evidence of Synergies: The evolution of Imgtec since being acquired by Canyon Bridge has taken some time to manifest itself. In terms of synergies, the most pronounced development has been the creation of the Imagination University Programme in association with Peking University. The project includes a student development toolkit, recommended Imgtec hardware for trainee engineers, a curated reading list and a forum for technical support as well as assistance on elements of the curricula and student projects.²⁷

²² Collier, *China Buys the World*, p. 42.

²³ ‘Company Profile - Imagination Technologies PLC’, *Bloomberg*, accessed May 10th, 2020 - <https://www.bloomberg.com/profile/company/IMG:LN>.

²⁴ ‘Company’, *Imagination Technologies*, accessed May 11th, 2020 - <https://www.imgtec.com/company/>.

²⁵ ‘About’, *Canyon Bridge*, accessed May 11th, 2020 - <https://canyonbridge.com/about/>.

²⁶ Ben Martin, ‘Canyon Bridge bid for Imagination Technologies approved by UK court’, *Thomson Reuters*, November 2nd 2017, accessed January 4th 2020 - <https://www.reuters.com/article/imagination-technologies-deal/canyon-bridge-bid-for-imagination-technologies-approved-by-uk-court-idUSL8N1N880W>.

²⁷ ‘Training & Teaching’, *Imagination University Programme*, accessed June 10th, 2020 - <https://university.imgtec.com/teaching-download/>.

This is the clearest example of knowledge capital being exported and disseminated to a large audience in the present study. The significance of that very audience should not be underestimated either. In the race for AI supremacy that the Chinese government and Chinese companies find themselves in, having a high quantity of good AI-literate engineers is essential to scaling capabilities.²⁸

Internal contentions about Chinese control became apparent very publicly in April 2020, however, when the presiding CEO was removed and replaced by co-founder of Canyon Bridge, Ray Bingham. This led to the subsequent tendering of resignations by Imgtec's Chief Technical Officer and Chief Product Officer - the latter stating objection to working in a company now 'effectively controlled by the Chinese government'.²⁹ Bingham sought to keep the pair on-board, but it was reported that they were seeking further assurance that the company's operations were not set to be off-shored from the UK to China.

The extent to which the implications of the comment by Steven Evans, the CPO, can be verified are limited. It seems reasonable to conclude that he had found internal developments unnerving. The assurance sought over offshoring is a strong indicator of their fears. The matter was a source of sufficient consternation for the British government to involve themselves as voluntary mediators. Indeed, they urged all parties to come together to resolve differences and ensure the UK operations of Imgtec remained as such.³⁰

Private Enterprises

Private enterprise has played an increasing role in China's domestic economy and accounted for a large proportion of the country's growing global footprint in international business and FDI. Operationally these companies largely function like their foreign counterparts as are their ownership models, whether they stand alone or feature as a division of a conglomerate. Early forays in FDI and joint ventures with foreign business partners was an exercise in fact finding and apprenticeship in business management in many cases.³¹

Most importantly, they operate wholly in pursuit of their commercial interests and the execution of their corporate strategy. Those companies that provide goods and services that fall within the parameters of Beijing's own industrial strategy can prove advantageous commercially, financially and economically as companies like Huawei realised a decade ago by way of subsidies granted to assist their expansion.³²

²⁸ Kai-Fu Lee, *AI Superpowers: China, Silicon Valley and the New World Order* (Manhattan, NY: Houghton Mifflin Harcourt, 2018), p. 83.

²⁹ Eliza Gkritsi, 'Chipmaker executives quit over Chinese takeover', *Technode*, April 13th 2020, accessed May 16th 2020 - <https://technode.com/2020/04/13/chipmaker-executives-quit-ahead-of-chinese-takeover/>.

³⁰ 'UK monitoring Imagination Technologies situation - government source', *Thomson Reuters*, April 17th 2020, accessed May 11th 2020 - <https://www.reuters.com/article/uk-china-britain-imaginationtechnologies/uk-monitoring-imagination-technologies-situation-government-source-idUKKBN21Z2XW>.

³¹ Clifford, *The China Paradox*, pp. 130-134.

³² Hong Shen, 'Across the Great (Fire)Wall: China and the Global Internet [PhD Thesis]', *University of Illinois* (2017), pp. 128-129.

China's private firms began to emerge under nascent capitalism of Deng's reform era and, to some degree, took the CCP by surprise at first. They have also proven to be some of the most innovative indigenous enterprises with a level of international success to match. Much of their success domestically derived from plugging gaps in the market where SOEs had failed to adapt and modernise, as in the area of micro-financing. Here and internationally China's "unicorn" disruptors have come to resemble the country's answer to Silicon Valley - the BATs (Baidu, Alibaba/Ant Group, and Tencent) to the US's FANGs (Facebook, Amazon, Netflix and Google).

Financing Mix

The commercial success of private firms has allowed them to generate returns that consistently outperform many SOEs and SPPs that have failed to utilise capital resources as efficiently. In 2016 the average return on invested capital (ROIC) for a sample of five SOEs was 4.03%.³³ In the same period the global ROIC average was 7.8% and in China alone the average was 6.8%.³⁴ Consequently they have been able to drive their own growth internally with full control over cash and equivalents for the purposes of reinvestment.

As mentioned, they have at times benefitted from subsidies or, at the very least, cheap financing options from Chinese banks. Long-term access to advantageous banking services remains in question though. As Magnus and Collier have both acknowledged, private firms are likely at the back of the queue for access to finance if a severe constriction of capital were imposed by the CCP in its efforts to control capital and the value of the renminbi.³⁵

Like the larger publicly traded SPPs, numerous firms in China utilise international capital markets with prominent companies like Alibaba also listing of foreign stock exchanges too. According to the OECD's last Asian equity market review in 2019, Chinese companies raised approximately \$60bn from Initial Public Offerings in capital markets.³⁶ That said, the recent cancellation of the \$30bn Ant Group IPO (Alibaba owner Jack Ma's digital payments group) demonstrates the reach of the State Council when it chooses to wield its control over private enterprise.

Case Study – KUKA Robotics Acquisition 2016

Target Asset: KUKA Robotics heritage stretches back to Keller & Knappich of Augsburg, Germany, established in 1898. In 1998, they became one of the first companies

³³ Collier, *China Buys the World*, p. 82; Sample taken from China State Construction, State Power, Three Gorges, Harbin Electric and Sinomachine.

³⁴ McKinsey & Co, 'Corporate Asia: A Capital Paradox', January (2020), pp. 4-5.

³⁵ Collier, *China Buys the World*, p. 104; Max J. Zenglein and Maximilian Kärnfelt, 'China's Caution About Loosening Cross-Border Capital Flows', *Mercator Institute for China Studies*, no. 8, June (2019), pp. 1-12.

³⁶ OECD, *Equity Market Review of Asia 2019*, OECD Capital Markets Series, Paris (2019), <http://www.oecd.org/daf/ca/oecd-equity-market-review-asia.htm>, p. 17.

with global presence to export robots to China - supplying them to Audi's Chang-chung manufacturing plant. According to *Statista*, KUKA enjoyed 12-15% of global market share in the automated robotics sector in 2019.³⁷

Investor: Midea Group was found by He Xiangjian in 1968. They originally specialised in the manufacture of consumer appliances, being one of the first Chinese companies to take advantage of the Reform and Opening-Up Policy in 1980. Today they generate \$40.5 billion in annual revenue and employ in excess of 150,000 people worldwide.

Terms of the Deal: Midea Group were already in possession of 13% of KUKA's stock which entitled them to shareholder voting rights. They used their position to force a hostile takeover, placing a tender offer in August 2016 for the 82% of the remaining stock.

Midea guaranteed the integrity and independence of KUKA for up to seven years (2023). In that agreement, commitments were made to: the independence of the executive board; 'recognition of German co-determination and adequate representation by Midea on the supervisory board'; protection of KUKA's brand, its R&D obligations and the business data of its partners; retention of its German headquarters and all its employees; and most importantly, a pledge *not* to conduct any corporate restructuring.³⁸

In return for these assurances, the executive board and KUKA's shareholders agreed to sell the majority stake in the company to Midea at an agreed offer price of €115.00 per share. This it was agreed presented an attractive premium to the shareholders, who were effectively being offered a 60% premium on the closing stock price of the company the day before Midea had increased its minority stake to 10.2% in February 2016.

Evidence of Synergies: Midea Group have stayed true to the terms of the acquisition and currently hold no positions on the executive board of KUKA, instead taking up positions on the supervisory board for the company, featuring: Dr Yanmin (Andy) Gu, Vice President of Midea and head of overseas strategy, who is now the Chairman of the KUKA supervisory board.

Another important development has been the establishment of a KUKA robotics plant at Midea's Shunde site in Foshan, Guangdong Province. Coupled with the reduction in staff at the Augsburg headquarters in Germany, one might surmise the beginnings of a shift in KUKA's centre of gravity towards China. This remains one of the known unknowns where the expiry of the acquisition assurances are concerned.

³⁷ 'Major companies in the global industrial robot market in 2019', *Statista*, April 20th 2020, accessed May 12th 2020 - <https://www.statista.com/statistics/317178/leading-industrial-robot-companies-globally-by-revenue/#statisticContainer>.

³⁸ 'Company Presentation 2020', *KUKA*, p. 3.

Evidence of synergy between KUKA, its subdivisions such as Swisslog Healthcare and Midea's Chinese subsidiaries, however, is very much a known-known. The joint-venture approach has proven to be the one of choice. They have created two Robotics China joint ventures with 50 percent stakes equally held by KUKA and Midea (achieved by capital increases from Midea in existing KUKA companies): Swisslog WDS China joint venture and a Swisslog HCS China JV.³⁹

Summary

Having examined the risk profiles of Chinese investors, their motivations, financing, ownership structures and examples of their investment activity, it is worth relating them back to the MGI's value chain criteria:

1. *Investment at scale* - There is clearly no shortage of investment. Chinese state-backed investors have disproportionate access to domestic debt facilities. Levels of debt for these companies is significantly higher than foreign counterparts. The assumption is that the survival of the CCP guarantees their long-term solvency. Any shock to debt markets or the value of the renminbi, however, is consequently a "black swan" macroeconomic risk that ties Euro-Tech companies into potential ripple effects through their integration into Chinese markets.
2. *Acquisition of Tech "Know-How"* - Efforts have been made to exchange technological knowledge in terms of both the "hard" IP and the "soft" processual expertise. This has been achieved through M&A but also through joint ventures that have, as in the case of NXP, derived from previous dealings in the Ampleon purchase. The assumption that sharing proprietary knowledge jeopardises its market value, however, should be kept in mind.
3. *Ability to create new, large markets* - A largely reciprocal process, in which Chinese investors and European suitors have used the fruits of COFDI to create new markets and access large, growing markets. The commercial importance of market access was reiterated by all three recipients of COFDI examined here.
4. *An effective system to encourage innovation and competition* - Processes of integrating acquired companies into Chinese markets will likely enhance the competitive dynamics of the technology ecosystem within China itself as a logical consequence of new market entrants. Conversely, the effect on European markets remains undetermined although it is not immediately evident that Chinese investment should fundamentally alter competitive dynamics within the European single market.

Evidence of State intervention is limited, though historically generous subsidies and direct financing for Chinese companies via China's State Policy Banks is a counter-balance to this. The interrelation of competition, investment and their effect on innovation is a complex matter. In the context of COFDI, this remains poorly understood - making it a known unknown in the short-term.

³⁹ Ibid, p. 8.

Possibilities and Limitations in Government Policy Options

Key Strategic Issues

- **Embracing the EU-China Comprehensive Agreement on Investment (CAI) presents new possibilities.** The recent agreement between the EU and China on investment has received tempered support from observers and stakeholders. Although this is far from a comprehensive trade deal, it does place in writing a shared commitment to increased market access in a range of areas, safeguards against forced technology transfers and the establishment of a dispute resolution mechanism.

Consequently, it is advisable to consider “testing the waters” of the new agreement with renewed entreaties in China. Seeking to establish a forum between the European Chamber of Commerce in Beijing and the Dutch Chamber of Commerce to aid Dutch Tech Companies navigate the range of opportunities or limitations, in light of the CAI, would be one such possibility from a policy-option perspective.

The only tangible limitation at this early stage in relation to the CAI’s implementation would be avoiding to great a deviation from the European Union’s public statements about the completion of the agreement. That said, utilising the spirit of the CAI allows for the reinforcement of a rhetoric of mutual-gain and the importance of Dutch and Chinese companies interacting on an even playing-field.

- **How does China’s expansion into advanced technologies impact the Netherlands position in the global technology ecosystem and what are commercial aspirations of Dutch Tech companies?** The latter two questions are essential for focusing the mind on the commercial and economic consequences of Chinese investment in Euro-Tech. Making clear the Netherlands’ industrial objectives and the parameters within which these can be achieved, with a fair consideration of Dutch-Tech’s likely aspirations where access of Chinese markets in concerned are at the heart of the issue.

With respect to the dynamics of the global technology system, broader considerations must be made regarding Chinese FDI. What are the worst possible consequences for the reception of Chinese investment in Dutch-Tech? What is the scope of pressure that could be exerted by the US in response, for example, and does the cost-benefit analysis justify exposure to US pressure?

- **The creation of a comprehensive investment screening mechanism and a framework for analysing the competitive effect of Chinese companies entering the Dutch Economy.** Andrew Collier rightly observed that the most important thing to remember when screening any prospective investment is that *every* acquisition is in some respects unique. Establishing a template for screening investments, that incorporate indispensable considerations in such

a decision-making process, would be a task that is relatively easy to achieve. The Netherlands in this regard benefits from an array of templates to borrow from.

Complementary to an investment screening template would be a framework for measuring the competitive effect of Chinese investment on Dutch-Tech companies - or any companies - within the Dutch economy itself and world-wide. Such possibilities are far from “fool proof” as no analytical toolkit is free from the law of unintended consequences. Establishing a project along these lines, however, is a highly feasible possibility.

Government Policy Options Grid

	Possibilities	Limitations
Political	<ul style="list-style-type: none"> Renewed dialogue between the European Chamber of Commerce in Beijing and the Dutch Chamber of Commerce on the topic of exploring potential opportunities created for Dutch-Tech by the Chinese Agreement on Investment (CAI). 	<ul style="list-style-type: none"> Deviations from EU policy and the sentiments expressed in the CAI would invite accusations of disunity or actions that may be perceived to threaten Europe’s strategic autonomy or economic sovereignty. Political Policy Options must also be weighted against likely responses from the US; no indication that Biden is less hawkish, even if the Administration is more constructive.
Economic-Commercial	<ul style="list-style-type: none"> Promote preference for joint-ventures rather than M&A to encourage knowledge-sharing and mutual-gain in the interest of Dutch and Chinese industrial objectives. 	<ul style="list-style-type: none"> Policy options should be weighed against the commercial aspirations of Dutch Technology companies. Threats to the future prospects of these companies could lead to their exit from the Netherlands (as we’ve seen threatened by Ericsson in Sweden).

	Possibilities	Limitations
Legal-Regulatory	<ul style="list-style-type: none"> • CAI has created formal dispute resolution mechanisms to deal with any perceived violations of the agreement or legal business practices. • Creating a framework for examining the competitive effect of Chinese investors in the Dutch economy. 	<ul style="list-style-type: none"> • Antitrust Law is under the purview of the European Court of Arbitration; all domestic regulatory changes must be in compliance with related EU law. • US Merger Authority also possesses oversight here.

Concluding Remarks

The evidence observed in this report has demonstrated that private Chinese companies remain committed to placing commercial objectives at the centre of their activities when investing overseas or engaging in joint-venture projects. The SOEs and SPPs, by contrast, place the CCP’s MiC25 Industrial Policy at the heart of their strategic objectives - acquiring companies concentrated in important emerging industries and technologies such as telecoms, semiconductors and artificial intelligence.

Acquiring a controlling stake in target assets has, by-and-large, been the preference for all Chinese investors. This “all or nothing” approach provides the greatest latitude in terms of synergising newly acquired assets into parent companies and most importantly, the Chinese domestic market. How hands-on investors tends to vary on a case-by-case basis but evidence of this is limited where investment in European Technology Companies are concerned.

The phenomenon of COFDI and its flow into Euro-Tech is a two-way street. The strongest indicator of this fact are the statements made by CEOs who were suitors of Chinese investment, who in all the cases mentioned here cited access to Chinese markets as a primary factor in their calculations.

Regardless of COFDI’s future trajectory in Europe, whatever it may prove to be, should be engaged with on a structured basis that considers each proposed investment is evaluated on its own terms. A framework for achieving this end should broadly account for political, commercial and regulatory considerations that may factor into the completion of any deals.

Understanding the competitive effects of Chinese investment in Euro-Tech is an understudied issue that will require greater attention as time progresses. Ultimately, there is much to be gained from synergies between Asian markets and European companies’ role in the global technological value chain.

Appendixes

Appendix #1: - Euro-Tech COFDI Recipients 2009-2019

Year	Month	Investor	Company Status	USD (\$ m)	Stake	Target	Sub-Sector	Country	Region
2019	December	Goodix Technology	Private	\$170.00	100.00%	NXP Voice and Audio Solutions	AI	Netherlands	NW Europe
2017	September	Canyon Bridge	Statepowered Private	\$740.00	100.00%	Imagination Technologies	AI	Britain	NW Europe
2019	January	Alibaba	Private	\$100.00	100.00%	Artisans	Big Data	Germany	NW Europe
2016	December	Jiangsu Shagang led consortium	Private	\$2,960.00	49.00%	Global Switch	Cloud Services	Britain	NW Europe
2018	July	AV/C	SOE	\$2,440.00	25.00%	Global Switch	Cloud Services	Britain	NW Europe
2016	July	Qihoo, Beijing Kunlun	Private	\$610.00	100.00%	Opera Software	Internet	Norway	Scandinavia
2011	June	Lenovo	Private	\$670.00	82.00%	Medion	Other	Germany	NW Europe
2018	May	Shenzhen Invengo	Private	\$200.00	80.00%	OEP	Other	Netherlands	NW Europe
2015	May	CIC	SOE	\$1,800.00	100.00%	RF Power Units	Other	Netherlands	NW Europe
2018	July	Tsinghua Holdings	SOE	\$2,570.00	100.00%	Linkems	Other	France	NW Europe
2018	October	Jiangsu Hagon	Private	\$100.00	100.00%	Ninrak	Robotics	Germany	NW Europe
2015	August	Guangdong Midea	Private	\$170.00	5.00%	Kuka	Robotics	Germany	NW Europe
2016	February	Guangdong Midea	Private	\$140.00	5.00%	Kuka	Robotics	Germany	NW Europe
2016	May	Guangdong Midea	Private	\$150.00	3.00%	Kuka	Robotics	Germany	NW Europe
2016	August	Guangdong Midea	Private	\$4,680.00	82.00%	Kuka	Robotics	Germany	NW Europe
2018	December	Wingtech	Private	\$880.00	100.00%	Nexperia	Semiconductor	Netherlands	NW Europe
2017	November	Tsinghua Holdings	SOE	\$140.00	8.00%	Dialog Semiconductor	Semiconductor	Britain	NW Europe
2016	June	JAC Capital, Wise Road Capital	SOE	\$2,750.00	100.00%	NXP Semi Standard Products	Semiconductor	Netherlands	NW Europe
2016	April	China National Silicon (consortium of Shanghai state firms)	SOE	\$190.00	100.00%	Okmetic	Semiconductor	Finland	Scandinavia
2014	February	Huaxin Post and Telecom	SOE	\$310.00	85.00%	Alcatel-Lucent	Telecom	France	NW Europe
2009	September	Unicom	SOE	\$1,000.00	1.00%	Telefonica	Telecom	Spain	Med
2011	January	Unicom	SOE	\$500.00	1.00%	Telefonica	Telecom	Spain	Med
2012	June	CIC	SOE	\$490.00	7.00%	Eutelsat	Telecom	France	NW Europe
2017	January	Ex-Im Bank	SOE	\$210.00	100.00%	Invitel Group	Telecom	Hungary	Eastern Europe
2014	July	SAFE	Statepowered Private	\$110.00	2.00%	Prysman	Telecom	Italy	Med
2014	July	SAFE	Statepowered Private	\$520.00	2.00%	Telecom Italia	Telecom	Italy	Med

Appendix #2 – Euro-Tech Strategic Benchmarks for the EU (EU Market Access)

Strategic Status Table			Strategic Benchmarks for the European Union					Supply Chain Status			Aggregate Status	
Target	Investor Type	Sub-Sector	C-Infrastructure	C-Tech	EU Market	Extra-EU Export	Onshoring	Supplier	Manufacturer	Retail	Consumption	Score
NXP Voice and Audio Solutions	Private	AI	N	Y	N	Y	Y	N	Y	Y	N	3 Strategic Asset
Imagination Technologies	Statepowered Private	AI	N	Y	N	Y	Y	N	Y	Y	N	3 Strategic Asset
Artisans	Private	Big Data	Y	Y	Y	Y	N	Y	Y	Y	N	1 Mild Strategic
Global Switch	Private	Cloud Services	Y	N	Y	N	N	N	N	Y	Y	0 Not Strategic
Global Switch	SOE	Cloud Services	Y	N	Y	N	N	N	N	Y	Y	0 Not Strategic
Opera Software	Private	Internet	N	N	N	N	N	N	N	Y	Y	0 Not Strategic
Medion	Private	Other	N	N	Y	N	N	N	N	N	Y	0 Not Strategic
OEP	Private	Other	N	N	Y	N	N	N	N	N	Y	0 Not Strategic
RF Power Units	SOE	Other	Y	Y	N	Y	Y	Y	Y	Y	N	2 Semi-Strategic
Linxens	SOE	Other	N	Y	N	Y	N	N	Y	Y	N	3 Strategic Asset
Nimnak	Private	Robotics	N	Y	N	Y	N	N	Y	Y	N	2 Semi-Strategic
Kuka	Private	Robotics	N	Y	Y	Y	N	Y	Y	Y	N	2 Semi-Strategic
Kuka	Private	Robotics	N	Y	Y	Y	N	Y	Y	Y	N	2 Semi-Strategic
Kuka	Private	Robotics	N	Y	Y	Y	N	Y	Y	Y	N	2 Semi-Strategic
Kuka	Private	Robotics	N	Y	Y	Y	N	Y	Y	Y	N	3 Strategic Asset
Nexperia	Private	Robotics	N	Y	N	Y	N	Y	Y	Y	N	3 Strategic Asset
Dialog Semiconductor	SOE	Semiconductor	N	Y	N	Y	N	Y	Y	Y	N	3 Strategic Asset
NXP Semi	SOE	Semiconductor	N	Y	N	Y	N	Y	Y	Y	N	3 Strategic Asset
Okmetic	SOE	Semiconductor	N	Y	N	Y	N	Y	Y	Y	N	3 Strategic Asset
Alcatel-Lucent	SOE	Telecom	Y	Y	N	N	N	Y	Y	Y	Y	2 Semi-Strategic
Telefonica	SOE	Telecom	Y	N	N	N	N	Y	Y	Y	Y	1 Mild Strategic
Telefonica	SOE	Telecom	Y	N	N	N	N	Y	Y	Y	Y	1 Mild Strategic
Eutelsat	SOE	Telecom	Y	Y	N	N	N	Y	Y	Y	N	2 Semi-Strategic
Invitel Group	SOE	Telecom	Y	N	N	N	N	Y	Y	Y	Y	1 Mild Strategic
Prvyslam	Statepowered Private	Telecom	Y	N	N	N	N	Y	Y	Y	Y	1 Mild Strategic
Telecom Italia	Statepowered Private	Telecom	Y	N	N	N	N	Y	Y	Y	Y	1 Mild Strategic

Appendix #3 – Strategic Benchmarks for China (“Know-How” & Dual-Use)

Strategic Status Table			Strategic Benchmarks for the European Union				Supply Chain Status				Aggregate Status	
Target	Investor Type	Sub-Sector	C-Infrastructure	C-Tech	Know-How	Dual Use?	Supplier	Manufacturer	Retail	Consumption	Score	Strategic Status
NXP Voice and Audio Solutions	Private	AI	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
Imagination Technologies	Statepowered Private	AI	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
Artisans	Private	Big Data	Y	Y	N	N	N	Y	Y	N	1	Mild Strategic
Global Switch	Private	Cloud Services	Y	N	N	N	N	Y	Y	Y	0	Not Strategic
Global Switch	SOE	Cloud Services	Y	N	N	N	N	N	Y	Y	0	Not Strategic
Opera Software	Private	Internet	N	N	N	N	N	N	Y	Y	0	Not Strategic
Medion	Private	Other	N	N	N	N	N	N	N	Y	0	Not Strategic
OEP	Private	Other	N	N	N	N	N	N	N	Y	0	Not Strategic
RF Power Units	SOE	Other	Y	Y	N	Y	Y	Y	Y	N	2	Semi-Strategic
Linxens	SOE	Other	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
Nimak	Private	Robotics	N	Y	Y	Y	N	Y	Y	N	2	Semi-Strategic
Kuka	Private	Robotics	N	Y	N	Y	N	Y	Y	N	2	Semi-Strategic
Kuka	Private	Robotics	N	Y	N	Y	N	Y	Y	N	2	Semi-Strategic
Kuka	Private	Robotics	N	Y	N	Y	N	Y	Y	N	2	Semi-Strategic
Kuka	Private	Robotics	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
Nexperia	Private	Semiconductor	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
Dialog Semiconductor	SOE	Semiconductor	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
NXP Semi	SOE	Semiconductor	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
Okmetic	SOE	Semiconductor	N	Y	Y	Y	N	Y	Y	N	3	Strategic Asset
Alcatel-Lucent	SOE	Telecom	Y	Y	Y	N	N	Y	Y	Y	2	Semi-Strategic
Telefonica	SOE	Telecom	Y	N	N	N	N	Y	Y	Y	1	Mild Strategic
Telefonica	SOE	Telecom	Y	N	N	N	N	Y	Y	Y	1	Mild Strategic
Eutelsat	SOE	Telecom	Y	Y	N	Y	N	Y	Y	N	2	Semi-Strategic
Invitel Group	SOE	Telecom	Y	N	N	N	N	Y	Y	Y	1	Mild Strategic
Prysmian	Statepowered Private	Telecom	Y	N	N	N	N	Y	Y	Y	1	Mild Strategic
Telecom Italia	Statepowered Private	Telecom	Y	N	N	N	N	Y	Y	Y	1	Mild Strategic

Bibliography

Primary Sources

'China Global Investment Tracker', *American Enterprise Institute* - <https://www.aei.org/china-global-investment-tracker/>

'Made in China 2025 Strategy for Auto Industry', *Chinese State Council*, June 1st, 2020, accessed June 15th, 2020 - http://english.www.gov.cn/policies/in-fographics/2015/06/02/content_281475119391820.htm

'Management Team', *Ampleon*, accessed February 2nd, 2021 - <https://www.ampleon.com/about/management-team.html>

OECD, *Equity Market Review of Asia 2019*, OECD Capital Markets Series, Paris (2019), <http://www.oecd.org/daf/ca/oecd-equity-market-review-asia.htm>

'Press Release: NXP Semiconductors Announces Agreement to Sell RF Power Business', *NXP Semiconductors*, May 28th 2015, accessed January 3rd 2020 - <https://media.nxp.com/news-releases/news-release-details/nxp-semiconductors-announces-agreement-sell-rf-power-business>

World Bank, 'Individuals using the Internet (% of population) - China', *International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database*, accessed February 20th, 2021 - <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=CN>

Secondary Sources

Clegg, J, and Voss, H, 'Chinese overseas direct investment into the European Union', in Kerry Brown (ed.), *China and the EU in context* (Basingstoke: Palgrave Macmillan, 2014), pp. 14-43

Clifford, Paul G, *The China Paradox: At the Front-line of Economic Transformation* (Berlin: De Gruyter, 2017)

Collier, Andrew, *China Buys the World: Analysing China's Overseas Investments* (Singapore: Palgrave Macmillan, 2018)

Da Costa Santos, Luís Pedro Moço, 'The Strategic Implications of the Chinese Foreign Direct Investment in Portugal (Conference Paper)', *Instituto de Estudos Políticos da Universidade Católica Portuguesa*, Mafra, February (2020), pp. 1-53

Gao, Paul, Cogman, David, and Leung, Nick, *Making Sense of Chinese Outbound M&A* (Beijing: McKinsey & Co, 2017)

Kratz, Agatha, Huotari, Mikko, Hanemann, Thilo, and Arcesati, Rebecca, 'Chinese FDI in Europe: 2019 Update', *MERICS*, April (2020), p. 9.

Lee, Kai-Fu, *AI Superpowers: China, Silicon Valley and the New World Order* (Manhattan, NY: Houghton Mifflin Harcourt, 2018)

Magnus, George, *Red Flags: Why Xi's China is in Jeopardy* (London: Yale University Press, 2019)

McKinsey & Co, 'Corporate Asia: A Capital Paradox', January (2020), pp. 1-14

McKinsey Global Institute, 'China and the World: Inside the dynamics of a changing relationship', July (2019), pp. 1-153

Shen, Hong, 'Across the Great (Fire)Wall: China and the Global Internet [PhD Thesis]', *University of Illinois* (2017), pp. 1-238

Tse, Edward, *China's Disruptors: How Alibaba, Xiaomi, Tencent and Other Companies are changing the Rules of Business* (London: Penguin, 2016)

Zenglein, Max J, and Holzmann, Anna, 'Evolving Made in China 2025: China's Industrial Policy in the Quest for Global Tech Leadership', *Mercator Institute for China Studies*, no. 8, July (2019), pp. 1-77

Zenglein, Max J, and Kärnfelt, Maximilian, 'China's Caution About Loosening Cross-Border Capital Flows', *Mercator Institute for China Studies*, no. 8, June (2019), pp. 1-12

Websites

Baker, Liana B, and Roumeliotis, Greg, 'Qualcomm says China comment will not revive NXP deal', *Thomson Reuters*, December 3rd 2018, accessed December 30th 2019 - <https://www.reuters.com/article/us-nxp-semicondtrs-m-a-qualcomm/qualcomm-says-china-comment-will-not-revive-nxp-deal-idUSKBN1O20BG>

'Executive Interview: Reinier Beltman, CEO of Ampleon', *Microwave Journal*, February 1st 2016, accessed February 2nd 2021 - <https://www.microwavejournal.com/articles/25858-executive-interview-reinier-beltman-ceo-of-ampleon>

Kleinhans, Jan-Peter, 'Geopolitics of the Global Semiconductor Value Chain', *Directions: Cyber Digital Europe*, October 19th, 2020, accessed February 20th, 2021 - <https://directionsblog.eu/geopolitics-of-the-global-semiconductor-value-chain/>

'NXP Closes Deal to Buy Freescale and Create Top Auto Chipmaker', *CNBC*, December 7th 2015, accessed December 30th 2019 - <https://www.cnn.com/2015/12/07/nxp-closes-deal-to-buy-freescale-and-create-top-auto-chipmaker.html>

'The Acquisition of Ampleon', *Datenna*, accessed February 2nd, 2021 - <https://www.datenna.com/the-acquisition-of-the-nxp-power-division/>

'UK monitoring Imagination Technologies situation - government source', *Thomson Reuters*, April 17th 2020, accessed May 11th 2020 - <https://www.reuters.com/article/uk-china-britain-imaginationtechnlgies/uk-monitoring-imagination-technologies-situation-government-source-idUKKBN21Z2XW>

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