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Chinese investment in Taiwan: Challenge or opportunity for Taiwan's high-technology industrial development?

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Abstract
Cross-Strait economic activities are no longer one-directional. The Taiwanese government opened the doors to Chinese investment in 2009.
The aim of this paper is to address the crucial question: What are the impacts of Chinese investment on Taiwan's high-technology industrial development? Two further questions immediately follow: Will Chinese investment put Taiwanese industrial development at risk? Will an influx of Chinese investment provide a turning point for Taiwanese industry?

The paper starts with a review of Chinese investment in Taiwan under the framework of the ECFA and then explains the justification for focusing on high-technology industry in Taiwan. It then outlines the main elements of Chinese outwards foreign direct investment (OFDI) before seeing to answer the above research questions.

Fieldwork for this paper was conducted from December 2014 to March 2016. Interviewees include Chinese investors from Beijing, Shanghai and Kunshan, and consultants from a Taiwanese institute created to promote industrial development.

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1. The impact of the Economic Cooperation Framework Agreement (ECFA) on Chinese investment in Taiwan

The Taiwanese government lifted the ban on Chinese investment (in certain industrial sectors) in June 2009. More importantly, the signing of the Economic Cooperation Framework Agreement (ECFA) in 2010 was a significant milestone of cross-Strait economic development. The statistical data in this article are taken from Mainland

Affairs Council (n.d.), Table 1: Trade between Taiwan and Mainland China, unless otherwise stated.

The total trade volume between Taiwan and China in 2009 was 78,672 million USD according to Taiwanese customs calculations, and 106,228 million USD according to Mainland China's calculations. In 2014, the cross-Strait trade volume was 130,160 million USD by Taiwan's calculation, and 198,314 million USD by Mainland China's calculation (Mainland Affairs Council n.d., Table 1). From the data it can be seen that cross-Strait economic activities are growing at an increasing rate over the years. However, this growing trade volume is very unbalanced. From 1991 to July 2015, approved outward investment from Taiwan in China amounted to 150,027 million USD, which equates to 61.2 per cent of Taiwan's total approved outward investment. By contrast, since the Taiwanese government lifted the ban on Chinese investment in Taiwan, the actual number of investments from 2009 to February 2016 was 814, and the total invested amount was 1,455 million USD (Investment Commission 2016). Though this is an impressive amount in five years, when compared to Taiwanese investment in China it is not very significant.

The asymmetry of trade dependency between Taiwan and China is phenomenal, which is also indicated by the fact that Taiwan's trade dependency on China increased from 4.2 per cent in 1990 to 26 per cent in 2014 (Kao 2015). Mainland China is Taiwan's greatest trading partner and most important export market. On the other hand, the importance of Taiwan for mainland China is much less. Taiwan's share of China's trade was about 6.1–6.8 per cent from 1990 to 2001, and peaked in 2002 at 7.2 per cent, but in 2014 had declined to 4.5 per cent (Kao 2015: 49–51).

The ECFA is an interim free trade agreement (FTA) across the Strait (Chou 2010: 3). The discussions leading to the ECFA started in late February 2009, one year after Ma came to power. Three previous attempts of the ECFA: first, the creation of the cross-Strait Common Market Foundation by the then Taiwanese vice-president, Vincent Siew; second, the entry of both China and Taiwan into the World Trade

Organisation (WTO) at the end of 2001; and third, the signing of the China and Hong Kong closer economic partnership arrangement (CEPA) in June 2003. However, Chou (2010) argued that the signing of the ECFA and of the CEPA are essentially different: the CEPA was implemented under the 'One country two systems' logic and was an agreement signed between the central government (China) and a special administrative zone (Hong Kong); this is a very different scenario from the ECFA, which was discussed and signed between two political entities (China and Taiwan), neither of which has de facto governance capacity over the other, though each of them claims to have, in different ways.

From Taiwan's perspective, Chou listed three main reasons to support the ECFA, and also three main reasons to oppose it (Chou 2010). In the following we will only discuss those reasons that relate to cross-Strait economic activities. Among the positive arguments, the first and foremost reason for Taiwan to sign the ECFA is to increase the volume of trade with the mainland, as China, as has been shown previously, is Taiwan's main trading partner (Chou 2010: 7). Nevertheless, this fact became the most important argument to be used by people opposed to signing the ECFA. Campaigners against the ECFA emphasised that it would result China's gaining access to Taiwanese markets and threaten the employment of Taiwanese labourers and farmers. Furthermore, it would lead Taiwan to become overly dependent on trading with China (Chou 2010: 11).

The argument of this paper is not intended to be particularly for or against the ECFA. However, just to analyse these two anti-ECFA arguments, they are actually quite different from the reality. The concern that signing the ECFA would open the door to the Chinese people and threaten domestic jobs in Taiwan was a pure construction. The fact is, Taiwanese regulations on Chinese people who want to visit Taiwan, let alone to reside in Taiwan, are very strict (National Immigration Agency, n.d.). Although at present, the Taiwanese government allows citizens from 47 mainland cities to visit Taiwan freely (which means those citizens can apply for a tourist visa to Taiwan

individually, not to be restrained within a tourist group), for mainlanders who are not from those 47 cities, the Taiwanese government specifies that Chinese visitors have to join qualified tourist groups in Taiwan, in order to control the tourist groups' itineraries. However, this opening of cross-Strait tourism doesn't extend to Chinese investors. For instance, my interviewee told me that: "I only can get a 15 days' visiting visa each time. This is extremely difficult for me as an investor to Taiwan. Fifteen days is a very short period for me to arrange details of my business in Taiwan. From last April [2013] until now [April 2014], I have been to Taiwan at least seven times. If my company only has me as a CEO to set up the company, it will be very troublesome, because I can only stay in Taiwan for 15 days each time. That's a very limited period of time to actually set up a business in any given country." (Interview data, SH1).

The argument that signing the ECFA would lead to Taiwan becoming overly dependent on trade with China is also false, mainly because even without signing the ECFA, Taiwan's trade had already become overly dependent on China, as indicated above. It is certainly unbalanced and risky for a country to depend on one specific exporting market, as with China in Taiwan's case. However, the argument here is that this is an existing fact – that Taiwan's economy has been overly dependent on the Chinese market since about the 1990s, so signing an interim FTA like ECFA between China and Taiwan would not alter this existing fact.

The signing of the ECFA was finalised in September 2010 (BBC News 2010). However, the ECFA is a framework of economic agreements: to give substance to these pacts, more detailed agreements have to follow. If signing the ECFA was also an attempt for Taiwan to save its declining economy, especially after the 2008 financial crisis, then the predicted economic benefits for Taiwan were GDP growth of 1.65–1.72 per cent, employment growth of 2.6 per cent and growth in industrial output of approximately 2.83 per cent (Armstrong 2013:100). Those numbers cannot be verified, since the first concrete agreement under ECFA, the cross-Strait Service Trade

Agreement (CSSTA), ran into considerable problems and has not yet been implemented at the time of writing.

Starting in June 2013, the KMT to push through the CSSTA without acknowledging the views of the opposition party (DPP) and, more importantly, the people's distrust of the ECFA. The CSSTA was negotiated and signed in Shanghai on July 21, 2013 by representatives of the Straits Exchange Foundation and its Chinese counterpart, the Association for Relations across the Taiwan Strait (ARTS) (Rowen 2015: 6). Under the CSSTA agreement, eighty sectors of China's economy will be opened to Taiwanese investment and sixty-four sectors of Taiwan's economy to Chinese investment, including hotels, tourism, printing and medical services (Rowen 2015). From the number of sectors being opened, it looks like China has shown greater flexibility to open itself to Taiwanese investment; however, what most Taiwanese are about with regard to the CSSTA is not which party has more willingness to open up for the other side, but the process of passing this agreement through Taiwan's Legislative Yuan. Anti-CSSTA activists argue that this agreement was concluded through secretive negotiations with China, and claim that the KMT wanted to pass this legislation without considering the other party's objections (Rowen 2015). A massive social protest broke out on March 18, 2014: on the evening of that day, a huge group of occupiers led by the loosely organised student group, the 'Black Island Nation Youth', occupied the Assembly Hall of Taiwan's Legislative Yuan; the occupation, which has been known as the Sunflower movement, lasted 24 days. The signing of the CSSTA was therefore suspended.

Has the Sunflower movement impacted on Chinese investors' willingness to invest in Taiwan? At the moment of the writing, the answer from the Chinese investors is Yes. Political uncertainty actually became their biggest worry and concern after the Sunflower movement (interview data SH1, K1, K2): Taiwan's democracy seems not to guarantee Chinese investors a stable investment environment.

2. The importance of high-technology industry

This section explains the importance of the IT industry in Taiwan and China, then the setting up of IT businesses by Taiwanese investors in China.

The reason that the IT sector has far more strategic importance than other sectors is because modern IT affects all sectors of the economy by providing both forward and backward linkage (Nau 1986). As Vincent Wang argues (Wang 1995: 551), the development of the IT industry of a country is not a purely economic decision: it has more to do with political implications. Furthermore, Chu's research shows that the IT industry, or specifically the semiconductor industry, has not only political but also security concerns, and it relates not only to the cross-Strait relationship but also the China–Taiwan–United States triangular relationship (Chu 2008). The reason for this is that the most common application of the semiconductor industry, making silicon chips, is applied to almost all civil and military high-tech equipment, for instance consumer data processing, communication, automotive, industrial, medical, military, and aerospace functions, etc.

The significance of the IT industry can be understood not only from a political/security perspective, but also from an economic perspective. The electronic hardware industry is the world's most important goods-producing sector. Not only does it employ more workers and generate greater revenue than any other manufacturing sector, its products also facilitate productivity in other sectors and stimulate innovation across entire economies (Sturgeon and Kawakami 2011: 121). Since the 1990s, Taiwan has aimed to transform itself from a reliable OEM (original equipment manufacturer) into an ODM (original design manufacturer). This means that Taiwanese high-tech companies do not only want to do low-end assembling or packing but also aim to establish their own brands. However, wishful thinking alone does not suffice to establish brand-name companies in the high-tech sector; it requires huge support from the government, and also the supply of human capital. In terms of governmental support, as indicated by Wang (1995) and Wong (2012), the Taiwanese

government played a significant role in promoting the development of high-technology industries in Taiwan. In 2014, the Asian Development Bank (ADB) published a report on the development of Information and Communication Technology (ICT), which rated Taiwan the first among developing countries in Asia. Taiwan was even more advanced than OECD countries according to the ADB's report (Asian Development Bank 2014: 76). Therefore, from the past to the present, it can be seen that high-technology industry has played an important role in Taiwan's economic development.

Apart from the Taiwanese government's efforts in creating an environment for innovation, the early business model of most Taiwanese IT/electronics industries was to preserve the upstream factories in Taiwan and set up low-end factories in China for cheap labour and favorable tax policies. As Luthje pointed out, Taiwanese manufacturers in the microchip industry have taken the lead in building wafer-fabrication plants in China (Luthje 2003: 345). The advantage of Taiwanese firms is their strong link to Silicon Valley in the US; therefore Taiwanese firms play a key role in managing relationships between Chinese factories and American IT firms. However, since the start of 2000, Chinese domestic firms have also emerged, as Hart-Landsberg and Burkett (2006) pointed out, such as Lenovo and Huawei. They are multinational firms themselves, though it is doubtful whether these Chinese domestic firms could be internationally competitive or develop further in the realm of R&D (Hart-Landsberg and Burkett 2006: 20).

In China, it can be seen that the country is a net importer of high-tech goods. Between 1997 and 1999, high-tech goods represented 14 per cent of its imports and 8 per cent of its exports. These percentages are relatively high, as in the same period, the EU showed a high-tech content of 9.5 per cent in both exports and imports (Fontagne, Freundberg, and Unal-Kesenci 1999). It is indicated that China's processing trade is concentrated mostly in relatively high-tech products and carried out largely by foreign firms.

With regard to Taiwanese investment in China, during the period roughly from 2000 to 2010, Taiwanese IT/electronics companies in China indeed laid the foundation of China's IT industry, especially in the Yangtze River Delta (Kunshan and Suzhou area). As indicated by Wang and Lee (2007: 1877), the early model of Taiwanese IT companies' investment in Suzhou was based on Taiwanese factories' urgent need for cheaper production sites (referring to both labour costs and land rents). Kunshan and Suzhou both became quite ideal candidates because of local officials' highly corporate attitudes, to encourage Taiwanese businessmen to settle down there (Lee 2012: 6). Nevertheless, there are two important points to address here. First of all, although the IT industry has been Taiwan's national champion as argued earlier in this section, the main motivation for Taiwanese IT firms to relocate in China was cheaper production costs. As a result, despite the risk of sharing their 'know-how' with Chinese firms or employees, Taiwanese IT investors still migrated cross the Strait starting in the mid 1990s.

One of the interviewees pointed out that "Taiwan is very protective of its patent or industrial knowledge. However, Taiwan's know-how is not high-end, is not innovative; Taiwan still learns from western countries' know-how and applied those knowledge to local markets. In other words, the 'know-how' in Taiwan can be very easily copied or learned by Chinese investors" (Interview data, interview SH2). The quote from this interviewee rightly reflects the fact that Taiwan only serves as a "transmission belt" between Western countries' advanced designs and China's low-skilled production.

The turning point of China was no longer limited to low-skilled production: since the start of 2000, the Chinese domestic firms Lenovo and Huawei also emerged, as discussed above. China also ceased to be only a recipient of foreign direct investment: since 2005, China has started to invest abroad in more impressive amounts. At the end of 2005, the total OFDI flows reached 12.26 billion USD, with a year-on-year increase of 123 per cent (MOFCOM 2014). Among the industrial categories of investment, technology investment amounted to 2.31 per cent (MOFCOM 2014). It is

therefore important for us to have a brief overview of China's Outward Foreign Direct Investment (OFDI) in our next section.

3. A brief overview of OFDI theory as applied to China

This section begins with a broad overview of China's OFDI, then proceeds to look more specifically at different sectors and different regions' OFDI flows.

The standard explanation of OFDI is that Multinational Enterprises (MNEs) possess and leverage superior managerial and technological resources that enable them to enter the global market. In recent years, traditional FDI theories have been challenged by the need to explain Chinese OFDI in a number of studies looking at the emergence of Chinese MNEs. One of the strongest criticisms of mainstream FDI theories is that they have been built largely on the observations of developed country investors (Buckley et al. 2007), and fail to capture the unique characteristic of MNEs from an emerging economy. For instance, Li (2003) asserts that the Ownership–Location–Internalization (OLI) paradigm cannot explain the Chinese MNEs very well since they are considered to be latecomers that lack firm-specific advantages to exploit internationally. More specifically, although Chinese MNEs are also searching for lucrative locations and internalize transactions (conforming to the L and I parts of the OLI paradigm), they start from a resource-meagre position without sufficient technology and management advantages (the O part seems to be less applicable). Some scholars have found a way to reconcile traditional FDI theory with the emerging MNEs by arguing that Chinese MNEs present a prevalent case of asset-seeking FDI since most of them may lack ownership advantages. Broadening the scope of the OLI paradigm, Buckley et al. (2007) suggest that Chinese MNEs could operate more efficiently in certain industries because of certain advantages. On the other hand, the mainstream perspective on internationalization assumes that firms must exploit their existing ownership advantages when they enter the international

market. However, Child and Rodrigues (2005) point out that Chinese firms prefer addressing competitive disadvantages rather than exploiting existing competitive advantages. This is because Chinese firms need to catch up with early-developing countries in terms of technology and know-how. Thus, the latecomer firms need to build sustainable global competitiveness by acquiring appropriate assets and resources. In addition, capital market imperfections in China have the consequence that capital is available at below-market rates for a considerable period of time, creating a semi-permanent disequilibrium in the capital market that outward investors can exploit (Buckley et al. 2007). More specifically, state-owned firms may have access to capital at below market rates. The inefficient banking systems may make soft loans to potential outward investors. This point will be explained further in our next section.

4. The determinants of Chinese OFDI

Although existing theories offer a useful starting point for understanding the determinants of Chinese OFDI, it is well accepted that a special theory is needed given all the unique features of Chinese firms. (Buckley et al. 2007). Despite the consensus that foreign-market-seeking, cost-reduction-seeking and resource-seeking could be the primary motivations for FDI, the continuing discussion about the unique characteristics of developing country investors is entering a new phase in the context of globalization (Dunning, 1995, 2000; Buckley et al. 2007; Li 2007; Deng 2009). Specifically, the existing OFDI theory, including the Ownership–Location–Internalization (OLI) model, has been challenged by a growing amount of research concerning whether the logic of these frameworks can be directly applied to emerging economies and, specifically, from China. Differences can be observed in terms of country-, industry-, and company-level determinants of Chinese OFDI. Country-level determinants include the size and level of technological and management know-how of the host market. Industry-level determinants consider the features of different industries. Finally, company-level determinants refer to characteristic of particular firms.

4.1 Country-level determinants

4.1.1 Market-seeking motives

Market-seeking motives are one of the most important drivers for Chinese firms. This is what happens when investors try to invest abroad in order to gain the benefit from global markets. According to Dunning (2001), increasing domestic competition and overcapacity force firms to enter the overseas markets. Numerous studies indicate that OFDI flow and market size are associated positively (Deng 2004; Liu, Buck and Shu 2005; Buckley et al. 2007). Despite the large populations, the Chinese domestic market is limited due to its low GDP. Chinese firms are likely to enter the global market since the domestic markets have reached the limits of effective demand (Deng 2004). As the Chinese domestic market was saturated due to inward FDI and intensive competition, Chinese firms tend to relieve overcapacity by expanding into foreign markets. However, instead of choosing geographically close countries as their destinations, Chinese firms prefer investments in developed countries. Luo and Tung (2007) argue that the market size and potential of the developed markets could be attractive to Chinese firms. Moreover, the fierce competition in bigger markets may help firms learn from their competitors, which could equip them with crucial competitive advantages in developing markets.

4.1.2 Natural resource-seeking

The natural resource-seeking motive is also one of the vital determinants of Chinese OFDI. According to Buckley et al. (2007), China is well endowed with natural resources; however, the Chinese government still needs to ensure the supply of domestically scarce factors given that the reserves of some specific sectors of natural resource are actually low in per capita terms. Thus, the authorities in China have

imposed incentives for firms to engage in natural resource-seeking FDI. At the same time, in order to support its phenomenal growth over more than a decade, large, cheap and easy access to natural resources needed both in the short and the long term.

4.2 Industry-level determinants of FDI

Since the Chinese government is willing to support firms to invest abroad, state aid has been provided to firms in some particular industries. Specifically, firms from the automobile and electronic industries are always offered preferential conditions. Policy-making is implemented at the industry level, which determines sector-specific incentives and restrictions on OFDI. Previous research has argued that outward FDI is more likely when the industry in which particular companies operate is considered more important by the Chinese government (Child and Rodrigues 2005; Buckley et al. 2007; Holtbrügge and Kreppel 2012). Deng (2004) also argues that authorities play a crucial role in shaping the structure of Chinese outward FDI. In fact, outward FDI from Chinese firms largely reflects governmental priorities and could be considered as part of the government's development plan. On the other hand, the competitive pressure on a specific industry in the domestic market could also influence the investment behaviour of Chinese enterprises significantly. After China's admission to the WTO, firms are facing increasing competitive pressure from abroad since more and more sectors are open to foreign investors. The competitive pressure of domestic markets in certain industries may drive firms to invest abroad. Chinese companies are being strongly encouraged to invest abroad. According to KPMG (2015), driven by more support than ever before, such as the "Silk Road Economic Belt" and "21st Century Maritime Silk Road" policy, infrastructure investment by Chinese firms is expected to grow rapidly. The implementation of the "One Belt, One Road" strategy will bring in new development opportunities for outward investment in energy cooperation and advanced manufacturing sectors.

4.3 Company-level determinants of FDI

4.3.1 Technology-seeking

According to Barney (1991), the best way of regarding a company is as a collection of productive resources, including different assets, capabilities, organizational processes and information which enable firms to gain competitive advantage in their domestic markets. After becoming leaders in their domestic markets, firms are willing to enter the overseas markets to maintain sustainable growth. However, unlike their competitors from developed countries, which often develop strong advantages before they internationalize, Chinese firms start from a resource-meagre position due to the relatively low level of economic and technological development of their home country (Wang et al. 2012). Deng (2004) claims that firms from emerging countries are more likely to invest in developed countries in order to gain the advanced technology to compensate their ownership disadvantages.

4.3.2 Strategic asset-seeking

Strategic asset-seeking FDI is directed toward the acquisition of advanced technology and manufacturing know-how (Buckley et al. 2007). Dunning (2001) points out that brand names, know-how, local capabilities and proprietary technologies could be the assets MNEs try to obtain. Modern management and technology skills are also very crucial for firms to build a global brand. OFDI will enable Chinese firms, which in particular have a strong demand for technological and management know-how, to take advantage of global opportunities. Dunning (2001) observes that Chinese firms are considered as strategic resource constraints in terms of brand development and proprietary technology. Deng (2007) also points out that strategic resource is the primary motivation behind Chinese investment. However, some other

company-specific resources including human resources and advertising resources could also be important determinants of OFDI.

5. Has Chinese investment in Taiwan Taiwan's high-technology industry?

As indicated in Section 1, the amount of Chinese investment in Taiwan, as a whole, is not very significant. Given the low amount of investment, it will be perhaps futile to discuss the challenge of Chinese investment in Taiwan if the number of investment cases and the amount of investment are both very low. However, the low amount of Chinese investment in Taiwan doesn't necessarily mean there is little challenge from China to Taiwan's high-technology industry. As discussed in Section 2, the link between Taiwan and China in the IT industry has been very close since the early 1990s, when Taiwanese IT producers started to invest in China for cheap land and labour. Therefore it is difficult to unhook the link between Taiwan and China in high-technology production, even if at this stage the actual amount of Chinese investment in Taiwan is low. This section discusses, first, why the Chinese investment in Taiwan, judging from the statistics, is low. The argument in this part mainly applies section 4, the determinants of China's OFDI, as the benchmarks to evaluate Chinese IT investors' willingness to come to Taiwan. Secondly, apart from direct investment, section 5.2 discusses whether there are alternatives to Chinese and Taiwanese capital cooperation, in response to the second hypothesis raised at the beginning of this paper; that is, whether the combination of Chinese capital and Taiwanese know-how can push Taiwan onto a higher level of the global value chain.

5.1 The reasons why Chinese investment in Taiwan is low

From a market-seeking perspective, the market in Taiwan is comparatively smaller than the mainland domestic market; the size of market therefore is determinative.

However, although the size of the Taiwanese market is smaller, as Taiwan's internationalisation started earlier than the mainland's, would it be possible for the mainland investors to invest in Taiwan as a "pre-test" to American or European markets? Most of our interviewees from mainland enterprises responded that, if they want to access American or European markets, they would go there directly: they don't need to use Taiwan as a "pre-test" for their western investment (interview data, K1 and K2). From an efficiency-seeking perspective (cost reduction), most of Taiwan's manufacturing factories have moved to China, as indicated above, in order to save on labour costs, and they have already completed industrial clusters in most Chinese coastal cities. As a result, for Chinese investors, it would be more efficient to produce products back in China not in Taiwan, due to the accessibility of those ready-made industrial clusters. What might be a consideration for Chinese investors is the resource-seeking perspective. However, the resource we refer to here is not natural resources, but the warmth of Taiwanese society. To quote one of my interviewees, a Chinese IT service investor: "Taiwan's service industry is much more advanced than in China. I think China already has the 'hard-ware', but Taiwan's service attitude is the key that I think makes it worth it for me to invest in Taiwan" (Interview data, SH1). However, the warmth of Taiwanese society in Chinese investors' perception has been severely affected by the Sunflower movement, as described in section 1.

The high-technology sector is an important sector for the Chinese government to support, as discussed in section 2. The attraction of Taiwan for Chinese high-technology investors is the know-how and human capital. Therefore, whether that would be a lot of "learning space" for the Chinese companies to invest is the key point. A Chinese IT company CEO explained: "Although we have few cultural and language differences with Taiwanese firms, we didn't consider investing in Taiwan because Taiwan's domestic market is not big enough, and Taiwan's core technology is not that mature" (Interview data, K3a). Another Chinese interviewee expressed it more directly: "To cooperate with Taiwanese factories has not been our main focus in the past ten years. Taiwanese factories' innovation capacity has slowed down,

therefore we are intending to work more with German, Japanese or American companies" (interview data, K4).

If Taiwan's innovation capacity only creates a little gap between Chinese and Taiwanese factories, many Chinese firms' strategy is to headhunt Taiwanese engineers or whole R&D departments. Head-hunting in fact, is a much easier way for the Chinese high-technology companies to "learn" Taiwanese factories' core know-how, for the reason that head-hunting avoids the complication of the Taiwanese government's regulation of Chinese investment, as well as the possibly hostile reaction from Taiwanese society after the Sunflower movement; compared to whole-scale investment, head-hunting is also a much more cost-efficient approach for the companies. A war of high-technology human capital has therefore started in the past five years. The Chinese investors say: "You can't blame those Taiwanese skilled engineers for coming to the Chinese market. We offered a much wider career development vision and to be very realistic, the salary is much better than in Taiwan" (Interview data, B1). Another interviewee, from the Industrial Technology Research Institute (ITRI) in Hsinchu, Taiwan stated that: "We are quite impotent to prevent colleagues leaving for jobs in China, when they (the Chinese companies) offer the same salary figure but in RMB; it is a real challenge to keep skilled human resource capital in Taiwan" (Interview data, H1). In high-technology industries, skilled human capital is at their heart, and the government's support is essential to prop up the industry. Taiwan had a group of excellent skilled workers in the late 1980s and the government's determination to develop high-technology industry resulted in the establishment of the Hsinchu Science Park, Thirty years afterwards, it is unfortunate that we see little progress, but instead the decline of the skills base, attracted by the Chinese magnet across the Strait for both better salary and career development. China's strategic headhunt therefore creates enormous challenge to Taiwan's high technology industry. One of interviewee mentioned: "I graduated from National Chengchi University, now if we want to call for an alumni reunion, we will hold in China not in Taiwan. "(Interview data, K6).

Having said all that, it doesn't mean that no Chinese investors intend to come to Taiwan. Towards the end of 2015, Tsinghua Unigroup – a mainland Chinese microchip-maker – unveiled its plans to purchase stakes of 25 per cent in two Taiwanese chip-testing companies, Siliconware Precision Industries (SPIL) and ChipMOS Technologies Inc. As part of the SPIL deal, Unigroup pledged adherence to Taiwanese regulations on investment from the mainland by producing an industry cooperation plan and declaring its intention not to gain control over SPIL. There would also be tangible benefits to SPIL in terms of better access to the mainland's increasingly important semiconductor market (Culpan and Browning 2015). Yet, despite such assurances by the mainland side and potential benefits for its Taiwanese counterpart, the deal has been viewed by the government as a national security issue, not least because the semiconductor industry is a sensitive sector in Taiwan with a key role in assuring its industrial competitiveness (Chao 2015). At the time of writing, these two deals were still awaiting approval from the Taiwanese government. On the prospect of a rejection of these investments, the CEO of Unigroup, Zhao Weiguo, mentioned in an interview the possibility of head-hunting human capital from Taiwan as a viable alternative if the government prevents the investment (Huang, Chen and He 2015).

5.2 Can the combination of Chinese capital and Taiwanese know-how push Taiwan onto a higher level of the global value chain?

The reasons for the low levels of Chinese investment are not only to be found in market elements, for instance the size of the Taiwanese market and capacity of Taiwanese human capital, but also in politics. Though the Taiwanese government lifted the ban on Chinese investment in 2009, it is, as discussed in section 1, difficult for Chinese investors to come to Taiwan due to various regulations of the Taiwanese government. The Taiwanese government also acknowledges the challenging environment for opening up the Taiwanese IT industry to Chinese investment: it is a

necessary but not a desirable choice. The (then) Economics Minister John Deng said in December 2015 that the Ministry of Economic Affairs (MOEA) will consider allowing Chinese investors to buy minority stakes in local integrated circuit design companies under certain conditions (Hung and Hung 2015). Though the announcement aims to show more governmental willingness, it also shows more reservations on the part of the Taiwanese government in setting the conditions for Chinese investment. The government's attitude is understandable since, as discussed in section 2, chip design is at the core of Taiwanese IT vitality and relates to national security as well. The Taiwanese government therefore has to be very careful of opening up a space for Chinese investment in this sensitive area. However, the speed of capital investment in fact doesn't wait for the government's eventual decision.

In 2011, Lenova started to plan a joint venture with Compal in Kunshan, the joint venture company LianBo formally established at the end of 2012. Compal is the second biggest notebook manufacture in the world, a Taiwanese company based in Kunshan since 2003. The reason that Compal wanted to establish the joint venture with Lenova was the domestic market that Lenova provided: "We wanted to increase our sales quantity, Lenova wanted our know-how, that's why we think this joint venture suited for our needs. We are not afraid that Lenova will 'steal' our know-how because we always remind ourselves to keep improving our know-how, to maintain a certain technology know-how gap between us and Lenova." (Interview data K3b).

At the end of 2014, Tsinghua Tongfang bought the computer manufacturing company Zi-he in Suzhou Industrial Park. Zi-he established its factory in Suzhou Industrial Park in 2001; it is an ODM computer manufacturer. After more than a decade staying in China, Zi-he realized that in fact, it would be much easier to let domestic enterprise take care of exploring the market and compete with other domestic enterprises for market channels, while they can focus on production (Interview data, K5).

From these two cases, it can be seen that cooperation between Chinese capital and Taiwanese technology in fact exists. In order to maintain the position of Taiwan's IT

manufacturing, Taiwanese companies should indeed invest in deepening advanced technology, in order to be better than the Chinese enterprises, especially those enterprises with governmental capital support. The only solution for Taiwanese companies is to improve their R&D skill, to be the specialists in manufacture of certain parts, to keep the know-how gap between Taiwan and China's IT manufacturing. As a result, the combination of Chinese capital and Taiwanese know-how can in fact give a cruel but positive push to Taiwan's IT industry. Taiwanese IT manufacturers have to keep pursuing better skill or technology; the technology competition will never end across the Strait.

6. Conclusion

To answer the questions which are addressed at the beginning of this paper:

Has Chinese investment in Taiwan threatened the development of Taiwan's high-technology industry? Yes and no. However, we can't just take the face value of this negative answer; a couple of implications are worth discussing further. First of all, the Chinese investment didn't threaten the development of Taiwan's high-technology industry because the investment cases are few, due to the unwillingness of most Chinese private entrepreneurs to invest in Taiwan and the Taiwanese government's strict regulation of Chinese investment in Taiwan. Taiwan's market has little attraction to the Chinese investors and Taiwan's R&D or innovation capacity also didn't convince many Chinese high-technology investors to cross the Strait. Headhunting those Taiwanese engineers or R&D designers might be an easier way for the Chinese high-technology companies to acquire the core know-how of Taiwan. Secondly, although Chinese investment in Taiwan didn't threaten the development of Taiwan's high-technology industries, their prospects for future development are rather bleak. Taiwan's technology capacity has been chased by rapidly learned or copied Chinese counterparts. China has become a global market to attract not only foreign investors

but also high-skilled workers. Along with its plan for industrial upgrading, the government in China supports almost unconditionally the domestic industrial supply chain. Taiwanese factories that in the past have always been a reliable partner of the supply chain are now facing the emergence of a Chinese domestic supply chain, or the so-called "red supply chain" (China Post 2015), while many Taiwanese electronics or IT factories have to prepare either to integrate better into the "red supply chain" or to move out of China. The difficulty for Taiwanese electronics or IT factories wishing to move out of China is, ironically, that they are already deeply embedded in the long-existing industrial clusters in China. It probably will be more practical and more realistic for Taiwanese IT/electronics factories to consider how to merge better with the Chinese supply chain.

The other half-answer is "yes" because, as reflected in the fieldwork so far, there are indeed cases of joint-venture or acquisition between Chinese and Taiwanese IT companies. Such joint venture and acquisition didn't take place in Taiwan for two reasons. First of all, from the market perspective, those Taiwanese companies had relocated to China since the early 2000s, so it is easier to get the chance for collaboration with Chinese companies since they've been resident in China for more than a decade. Secondly, and perhaps this is a stronger reason, the Taiwanese government's regulations discouraged many Chinese investors. Nevertheless, although Taiwanese government regulations are lengthy and difficult to meet, and Taiwanese society generally holds a sceptical attitude towards Chinese investment, still, Tsinghua Unigroup expressed their willingness to buy 25 per cent of Taiwanese companies' shares in Taiwan. The reason, according to this analysis, is not because of the market of Taiwan, but because of human capital: a group of talented Taiwanese workers that are not so easily head hunted.

Finally, the emphasis of this article is that the core issue affecting Taiwan's high-technology development is not Chinese investment in Taiwan and the possible threats coming along with this investment. The tangible challenge for Taiwan's

high-technology industries is how to find a suitable niche in the rising Chinese high-technology market, no matter whether that niche would be resting inside the Chinese mainland or in Taiwan. Furthermore, how Taiwanese manufacturers, whether based in Taiwan or China, can keep improving the core technology, not by rejecting collaborative opportunities with Chinese companies, but by strategically opening up.

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Interview data

B1, Interview date, December 6th 2015, Beijing

K1, Interview date, July 29th 2015, Kunshan

K2, Interview date, July 29th 2015, Kunshan

K3a, Interview date, July 30th 2015, Kunshan

K3b, Interview date: July 30th 2015, Kunshan

K4, Interview date, August 3rd, 2015, Kunshan

K5, Interview data, March 27, 2016, Kunshan

K6, Interview data, March 29, 2016, Kunshan.

H1, Interview date, July 7th, 2015, Hsinchu

SH1, Interview date: April 30th, 2014, Shanghai

SH2, Interview date: April 21st, 2014, Shanghai