Red Alert New Challenges for Taiwanese Fastener Industry

by Kristy Chi, MIRDC Industry Analyst

The Emerging Supply Chain of China Under Import Substitution Strategy

Taiwan's export has been dropping for 7 consecutive months until August 2015. Rumor has it that the red supply chain could be the culprit that made suppliers feel unsecure. What is the red supply chain? It is the result of China's ongoing import substitution policy where intermediate goods were originally imported from abroad but are now produced domestically in China. This forms a local supply chain, and people call it the red supply chain because China prefers red color.

After 10 years of development, China has turned from its previous role as a world factory into a world market. It has gradually got rid of the role of OEM and started to develop its own supply chain. Based on many years of experience with the U.S. and European countries, and learning from Taiwan and Japan, China gradually established its own complete industrial chain from the upstream to the downstream. The related policies for China's red supply chain include localization of foreign investors, the min. of 30% use of domestically made parts, and aggressive investments and M&A. Furthermore, China proposed the Chinese version of Industry 4.0, which will last for 10 years (China Manufacturing 2025), intending to add technical R&D to its advantage in workforce and capital. In the past, China's fastener industry could not compete with Taiwan due to the U.S. and European anti-dumping measures and its inconsistent quality, but now China is rising up with its advantages (capital, land, and workforce) to attract foreign companies for cooperation as well as its bold deployment in the entire supply chain (materials, R&D, technology, markets). In light of the increasingly competitive and strong rival, this article will explore how Taiwanese fastener industry is affected by the red supply chain and its corresponding strategies.

Fig. 1 Taiwanese Fastener Export in Jan. - Aug. 2015
图一 2015年1-8月台湾扣件产业出口情形

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.
Export Value (NTD 100 Million) 出口金额(亿元新台币)	119.2	94.5	116.0	107.8	115.5	108.6	109.2	101.5
Export Volume (10 Thousand Tons) 出口量(万公吨)	14.2	11.3	14.3	13.4	14.3	13.7	13.8	12.8

Source: Customs data from TIER; arranged by MIRDC in Sep. 2015
资料来源：台经院海关资料库/金属中心MII整理2015.09

红色狼烟四起

台湾扣件产业迎战新变局

金属中心产业分析师 纪翔瀛

一、中国大陆实施进口替代方案 红色供应链崛起

至2015年8月止，台湾出口连七个月衰退，舆论指出红色供应链或为元凶，顿时人人自危。何为红色供应链? 实为中国大陆实施进口替代政策也；将原本需要从国外进口的中间财转由中国大陆当地生产，建立在地供应链，又中国大陆喜好红色，故外界称红色供应链。

中国大陆经十年磨剑，从原本的世界工厂转型为世界市场，逐渐摆脱纯代工型态，转而自行发展产业链，借多年与欧美交手经验，从台日取经，渐渐拼凑出越来越完整的上中下游一条龙。中国大陆此番放出红色狼烟，相关政策包括外商在地化、限制当地零件采购须达30%以上，以及积极投资合并等；此外，更祭出横跨两个五年的中国版工业4.0《中国制造业发展纲要2015～2025》(简称中国制造2025)，企图在原有的人力、资本等优势上再添加技术研发创新一笔。过去中国大陆因欧美以反倾销税抵制以及品质良莠不齐，导致其扣件产业不敌台湾，但拥有吸引外商合作优势(资金、土地、人力)以及大胆布局上中下游(材料、研发、技术、市场)的魄力，中国开始站起来了。面临竞争力逐年提升的强敌，本文即探讨扣件产业在红色供应链崛起的状况下所受到的影响以及因应策略。

Analyzing the Current Condition of Taiwanese Fastener Industry

To understand if the rise of the red supply chain has affected Taiwan, let's start with a description of the status quo of Taiwanese fastener industry and look at the fastener trading condition between Taiwan and China and their trading performance in the international buyers market.

(1) Import & Export

In August 2015, the drop in Taiwanese total export deteriorated to -14.8%, marking the 7th consecutive export decline as well as the 3rd consecutive 2-digit drop. This has been the biggest drop since the economic crisis last time. Comparatively, in August 2015 the decline in Taiwanese fastener industry was not as drastic as other industries. As shown in Fig. 1, the fastener export value this August was estimated at NTD 10.16 billion, down 5.5% from NTD 10.74 billion in last year's corresponding period. The export volume this August was estimated at 128 thousand tons, down 2.7% from 132 thousand tons in last year's corresponding period. This August, the export volume and value were both predicted to decline by 7%, but still less than the margin of the 15% decline in the entire industry.

Another relieving news should be the result of Taiwanese fastener export in the first half of the year. As everyone knows, 2014 was a good year for the fastener industry. The export value broke the USD 4 billion mark, and both the volume and value set new records over the past decade. Despite the fact that in the first half of 2015 the market experienced investment deflation and conservative market sentiment, Taiwanese fastener export value in the first half of 2015 grew 5.3% (NTD 3.3 billion) over the previous same period. The export volume grew 3.8% (30 thousand tons) over the previous same period (Refer to Table 1).

Table 1. Comparison of Taiwanese Fastener Exports in H1 2014 and H1 2015
表一 台湾扣件产业2014年和2015年上半年出口比较

Fastener Industry 扣件产业	Export Value (NTD 100 Million) 出口值(亿元新台币)	Export Volume (10 Thousand Tons) 出口量(万公吨)
H1 2014 (2014年1-6月)	628.4	78.2
H1 2015 (2015年1-6月)	661.6	81.2
Growth Rate 成长率	5.3%	3.8%

In January-July 2015, Taiwan imported 3 thousand tons (NTD 190 million; average price NTD 56.9/kg) of fasteners from China. In contrast, Taiwan exported 11 thousand tons (NTD 1.92 billion; average price NTD 181.7/kg) of fasteners to China. A look at import and export data reveals trade surplus in Taiwan's fastener trade with China (refer to Fig. 2). Notably, the average export price of Taiwanese fasteners in 2014 was NTD 80.9/kg, while Taiwan's fastener export price to China was as high as NTD 181.7/kg. This indicates Taiwan mostly exported high value added fasteners to China, which should be mostly applied to high-end industries such as automotive and aerospace. This also reveals that China has successfully developed high-end downstream industries, and therefore, gives rise to the demand for high value added fasteners. Refer to Table 2 for fasteners exported from Taiwan to China. The import and export performance indicates that China is still dependent upon Taiwanese fasteners. However, coupled with China's downstream application industry, if China wants to support its local fastener industry and foster localized supply in the next decade, this will be negative to the fastener export from Taiwan to China.

二、台湾扣件产业现况分析

中国大陆红色供应链崛起对台湾是否有影响，先从台湾扣件产业现况谈起，由进出口贸易情形以及两岸在国际买方市场的贸易消长进行观察。

(一) 进出口分析

2015年8月台湾整体出口产业衰退幅度扩大为14.8%，是连续第七个月出口衰退，也是连续三个月出现二位数衰退，创金融海啸以来最大跌幅。相较之下2015年8月台湾扣件产业出口情形不如其他产业衰退剧烈，如**【图一】**所示，8月扣件产业出口金额预估为101.5亿元新台币，与去年同期107.4亿元新台币相比，衰退5.5%；8月出口量预估为12.8万公吨，与去年同期13.2万公吨相比，衰退2.7%；8月预估出口价量与上月相比双双衰退7%，与整体产业衰退将近15%相比，表现算是抗跌。

另一个让人稍感安心的数据是台湾扣件产业上半年出口表现。众所皆知2014年是扣件产业丰收年，出口突破40亿美元，量价皆达近10年高点。而今年上半年虽历经投资紧缩以及市场氛围转为保守，但上半年台湾扣件出口金额与去年同期相比成长5.3%，增加33亿元新台币；出口量与去年同期相比增加3万公吨，成长3.8%，详参**【表一】**。

最后，观察2015年1-7月台湾自中国大陆进口扣件共0.3万公吨，金额为新台币1.9亿元，进口单价56.9元/公斤；相较之下，台湾出口至中国大陆扣件达1.1万公吨，金额为新台币19.2亿元，出口单价达181.7元/公斤，比照进出口可知台湾扣件对中国大陆为贸易顺差，参见**【图二】**。但值得注意的是台湾扣件2014年平均出口单价为80.9元/公斤，而台湾出口至中国大陆扣件产品单价高达181.7元/公斤，可见多为高值扣件产品，而高值扣件产品又多应用于汽车航太等高端产业，显见中国大陆发展高端下游产业有成，故出现对高值扣件的需求，另附上2014年台湾出口至中国大陆扣件品项详见**【表二】**。由进出口表现可观察到中国大陆对台湾扣件仍有依赖，但未来10年若中国大陆有意扶植扣件产业由在地供应，加上中国大陆自有下游应用产业，则对台湾扣件出口至中国大陆的情形是不利的。

(2) Market Analysis

To look at the influence of the red supply chain at a macro-perspective, we have to not only observe the trade between Taiwan and China, but also observe global buyers' trade with Taiwan and China. We must observe whether there is any sign that Taiwanese fasteners are being replaced by China in the global market.

Currently the U.S. is the largest consumers market in the world, followed by the EU. Taiwan is so far the top production partner with the U.S. In 2014, Taiwan exported NTD 47.8 billion worth of fasteners to the U.S., which nearly accounted for 40% of the whole Taiwanese fastener export. China followed behind Taiwan and exported NTD 41.5 billion worth of fasteners to the U.S. in 2014, which accounted for 20% of its whole fastener export. Refer to Fig.3 for comparison among other countries.

In the first half of 2015, Taiwan was the top fastener import origin for the U.S., followed by China. (Refer to Table 3). In January - July 2015, the U.S. imported a total of USD 3.96 billion worth of fasteners, and those imported from China were worth USD 1.03 billion, up 13.2% from USD 910 million in last year's same period. Those imported from Taiwan were worth USD 1.17 billion, accounting for 30% of U.S. total imported value, up 14.7% from USD 102 million in last year's same period.

The second largest fastener consuming market in the world is the EU. Starting in 2012 the EU imposed the anti-dumping duty up to 74.1% on carbon steel screws imported from China and caused a big impact on China's fastener industry. China

Fig. 2 Taiwan's Import & Export Performance with China in Jan.-July 2015
图二 2015年1-7月台湾对中国大陆进出口表现

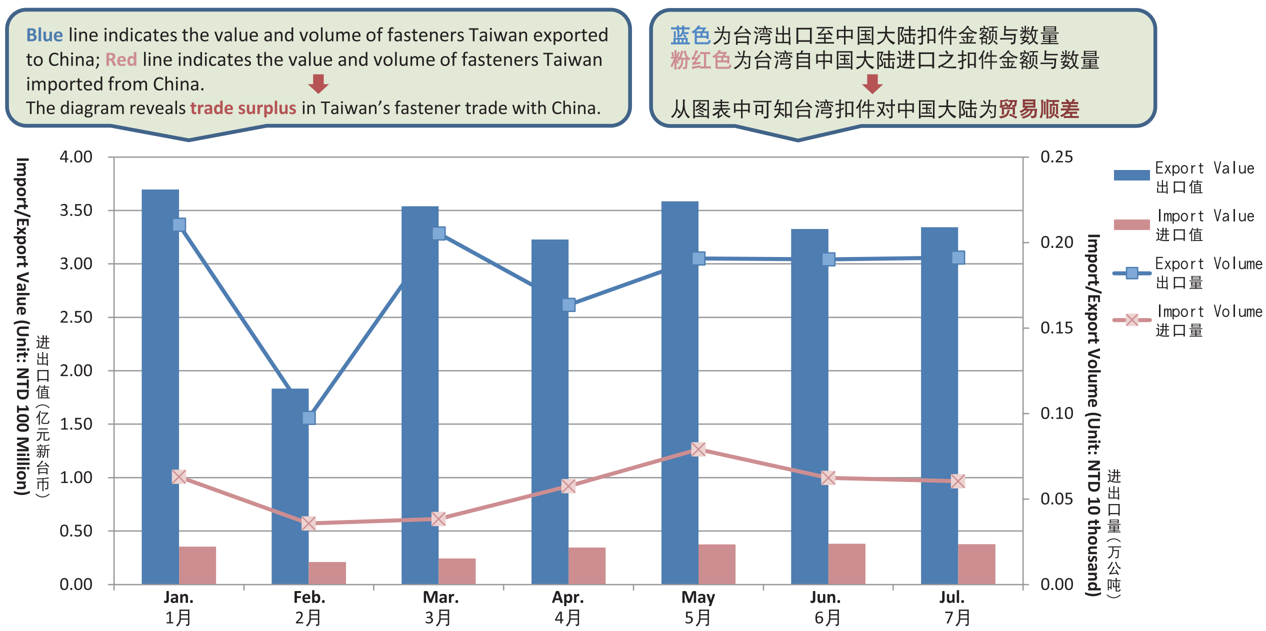


Table 2. Fastener Items Exported from Taiwan to China in 2014
表二 2014年台湾出口至中国大陆扣件品项

	Fastener Items Exported from Taiwan to China 台湾出口至中国大陆品项	Value (NTD 100 Million) 金额（亿元新台币）	% in All Types of Fasteners 占全部品项比例
1	73181590 Other iron and steel screws and bolts with/without nuts and washers 其他钢铁制螺钉及螺栓，有否附螺帽及垫圈均在内	18.9	47%
2	73181600 Iron and steel screws and nuts 钢铁螺丝帽	8.5	21%
3	73181900 Other iron and steel threaded products 其他钢铁螺纹制品	2.3	6%
4	73182200 Other steel washers 钢铁制其他垫圈	1.9	5%
5	73182900 Other non-threaded steel products 其他钢铁制无螺纹制品	1.4	4%
	Total of All Fastener Items Exported from Taiwan to China 台湾出口至中国大陆扣件品项总计	40.5	100%

Source: Customs data from TIER; compiled by MIRDC in Sep. 2015
资料来源: 台经院海关资料库/金属中心MII整理2015.09

(二)市场分析

广义地分析红色供应链影响层面，不仅仅是台湾与中国大陆之间，更要关注全球买方对台湾以及中国大陆的贸易情况，观察台湾扣件在全球市场是否有被中国大陆取代的趋势。

目前美国是扣件最大消费市场，其次为欧盟。台湾则为美国目前最主要的生产伙伴，2014年台湾扣件出口至美国为478亿元新台币，占台湾扣件产业整体出口比例将近4成；而中国大陆紧追在后，2014年中国大陆扣件出口至美国金额为415亿元新台币，占其扣件产业整体出口2成，其余比照请参考【图三】。

Fig. 3 Comparison Between Taiwan's and China's Fastener Export Destinations in 2014
图三 2014年台湾与中国大陆出口比较

Unit: NTD 单位: 新台币

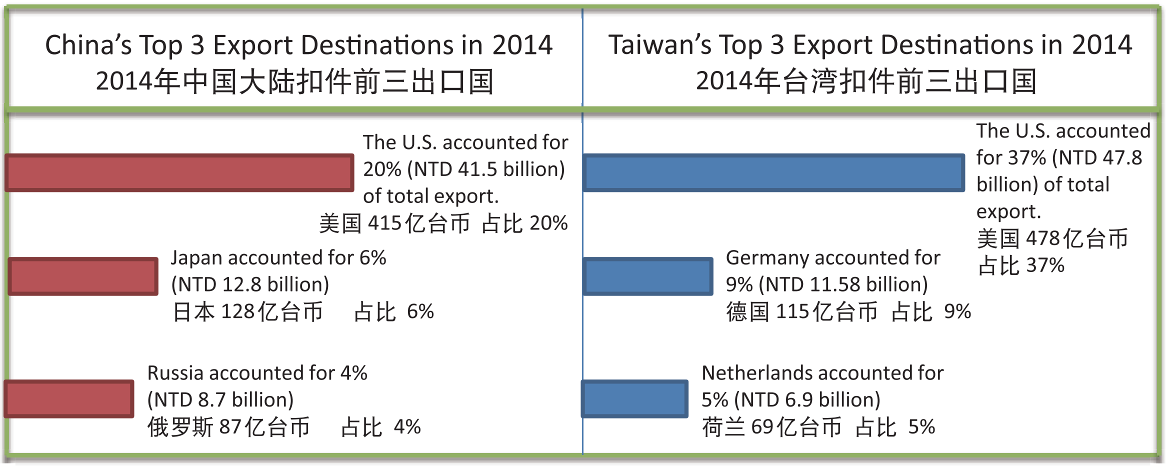


Table. 3 U.S. Fastener Import Condition from January to July 2015
表三 2015年1-7月美国扣件进口情形

Unit: USD 100 Million 单位: 亿美元

Importer 进口国	Jan. 1月	Feb. 2月	Mar. 3月	Apr. 4月	May 5月	Jun. 6月	Jul. 7月	Jan-July (cumulative) 1-7月累计	% in total 占比
World 全球	5.6	4.3	6.5	6.3	5.8	5.5	5.5	39.6	100%
Taiwan 台湾	1.5	1.2	2.1	1.9	1.7	1.6	1.6	11.7	30%
China 中国大陆	1.5	1.0	1.6	1.5	1.7	1.5	1.4	10.3	26%

Source: Customs data from TIER; Compiled by MIRDC in Sep. 2015
资料来源: 台经院海关资料库/金属中心MII整理2015.09

once had around 8 thousand fastener companies. However, since the anti-dumping measure was imposed, nearly 1/3 of them have stopped production or shut down, and order intake has dropped by 40%. Another 1/3 of the still existing fastener companies are expected to go bankrupt or shut down. After the EU imposed the anti-dumping measure on China, China's fastener export volume to the EU dropped to 500 thousand tons (in 2014) from 1.17 million tons (in 2008), and the export value dropped to NTD 28.2 billion.

In contrast, Taiwan is the EU's largest fastener import origin, accounting for 30% of the EU's total fastener import. In 2014, Taiwan exported 560 thousand tons of fasteners to the EU, with a 7% CAGR from 2010 to 2014. As indicated in Fig. 4, after the EU accused China of dumping carbon steel fasteners, in 2009 a reverse trend turned clear in Taiwan's and China's export to the EU. In the subsequent years Taiwan has evidently replaced China as the top import source for the EU. In the last 4 years, Taiwan's fastener export to the EU outperformed China in terms of the reverse situation in the export volume and the increasing export value. This indicates that Taiwan has replaced China as the top import origin and that Taiwan is trending for exporting high value added fasteners. This will help consolidate the position of Taiwanese fastener industry in the EU market and keep Taiwan from the impact of the red supply chain.

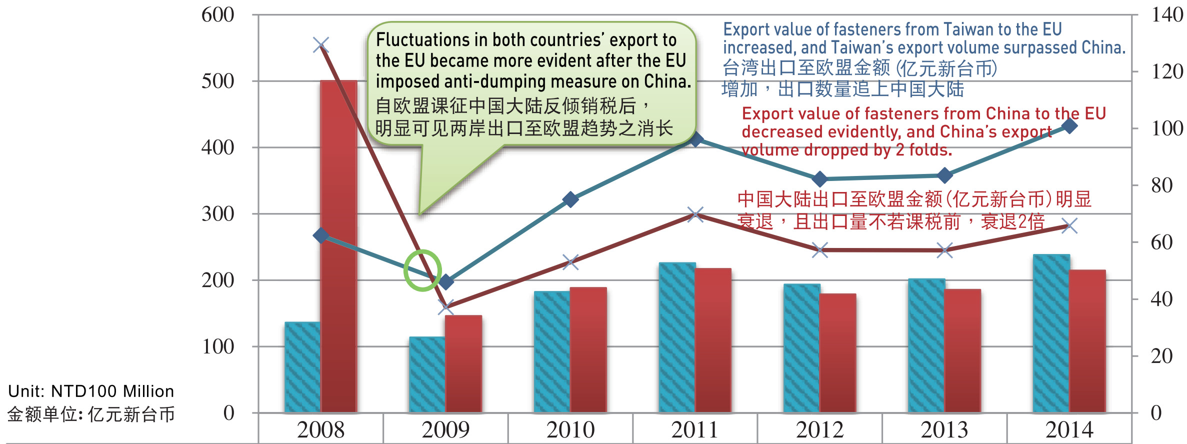
今年上半年美国进口以台湾为首位，中国大陆居第二位，详参**【表三】**。美国2015年1-7月扣件总进口额为39.6亿美元，其中自中国大陆进口金额达10.3亿美元，去年同期美国自中国大陆进口9.1亿美元，成长13.2%；美元自台湾进口金额则达11.7亿美元，在美国所有进口国中比例占3成，去年同期则为10.2亿美元，成长14.7%。

全球扣件第二大消费市场为欧盟，欧盟自2012年对自中国大陆进口之碳钢螺丝课征最高达74.1%的反倾销税，对其扣件产业冲击很大。中国大陆扣件厂商约有8千家，自被课征反倾销税以来，目前近1/3已经停产或倒闭，且订单量较课税前缩减4成，在既存扣件商中，估计可能还会再有1/3的厂商面临破产关闭的情形。自欧盟提出对中国大陆课征反倾销税后，中国大陆对欧盟出口量已从2008年117万公吨降至2014年50万公吨，出口值为282亿元新台币，相较课税前减少近2倍。

相较之下台湾为欧盟最大进口国，占欧盟进口国家中占比高达3成，在2014年台湾出口至欧盟数量高达56万公吨，2010至2014年复合成长率高达7%。从**【图四】**可见，自2008年欧盟控诉中国大陆碳钢件反倾销之后，2009年两岸出口欧盟表现明显反转，台湾在往后几年显然已取代中国大陆在欧盟的进口地位，近四年出口量皆优于中国大陆，可观察到除了出口量逆转外，出口金额节节升高，显见除了替代中国大陆进口以外，台湾所出口的扣件产品也有高值化的趋势，有助于台湾扣件业未来巩固在欧盟之地位，不致受到红潮倾复。

由以上数据观察，今年台湾扣件产业上半年出口值表现比去年成长5%，若非遇到总体经济情势以及货币市场扰乱影响，导致先进国家投资活动暂缓，应有更佳表现；其次，台湾扣件对中国大陆为贸易顺差，对台湾扣件产品有一定依赖程度；最后，在双边

Fig. 4 Taiwan's and China's Fastener Exports to the EU from 2008 to 2014
图四 2008-2014年两岸扣件出口至欧盟情形



	2008	2009	2010	2011	2012	2013	2014
Total Volume of Fasteners Taiwan Exported to the EU 台湾出口至欧盟数量	32	27	43	53	45	47	56
Total Volume of Fasteners China Exported to the EU 中国大陆出口至欧盟数量	117	34	44	51	42	43	50
Total Value of Fasteners Taiwan Exported to the EU 台湾出口至欧盟金额	267	197	321	413	352	358	433
Total Value of Fasteners China Exported to the EU 中国大陆出口至欧盟金额	555	159	227	299	246	245	282

Source: Customs data from TIER; compiled by MIRDC in Sep. 2015
资料来源：台经院海关资料库/金属中心MII整理2015.09

The data above show that the export value of Taiwanese fastener industry in the 1st half of this year was 5% higher than the record last year. If it were not for the influence of the macroeconomic conditions and the currency market that postponed the investment activities of advanced countries, there would have been better performance for sure. On the other hand, the surplus in Taiwan's fastener export to China means that China has a certain level of dependence upon fasteners from Taiwan. In addition, to compare the customers of Taiwan and China in the U.S. and Europe, Taiwan is still going ahead of China and may not be easily replaced by China in the short term. As a result, it is observed that the current Taiwanese fastener industry has not yet been greatly influenced by the emergence of China's red supply chain. With the worldwide market fluctuations such as the cancelation of China's favorable tax abatement for boron wire rods, the stock market slump in Q2 2015, low demand for steel, and the competition in currency

共同客户美国与欧盟方面台湾皆保持领先，暂无被红潮倾复取代之忧。因此，归纳目前为止台湾扣件产业并未受到中国大陆红色供应链崛起太大影响，历经2014年底中国大陆收回硼材盘元出口优惠、2015年第二季股灾、全球钢铁低迷、货币竞贬等全球市场波动后，下半年产业景气持续保守看待，等待投资信心恢复，预估全年出口值较去年略为成长2-5%，仍属不错成绩。

避红祸 两岸生产品质与价值差距为关键

比较两岸形貌，中国大陆扣件生产和贸易厂商近1万家，从业人员有100多万人，而台湾扣件生产和贸易商约1,300家，就业人数近3万人，以规模而论，我不及他；但中国大陆主要生产较低等级的扣件，用于机械设备、建筑以及一般工业用途等；对于高强度、高精密度有要求的扣件部分则大多依赖进口，主要用于汽车工业、电子产品、电子设备等。

而台湾过去30年从低碳钢扣件做起，发展历史较早，且经历过2次全球性经济危机，2000年让部分台商走出去，留下来的则努力转型升级，磨练自身技术，提高产品品质；2008年再度面临危机，但已经可以看到当年转型升级的成果，带领台湾扣件产业慢慢从一般标准件，到如今生产等级已拉高至可出口欧美汽车大厂及建筑用等级较高扣件，并持续研发新型合金材料应用于航太等级扣件，甚至取得波音等飞机制造大厂认证及试单。

迎战红潮 台湾扣件产业未来新动向

最近流行一句话：「世界上最恐怖的事情就是比你优秀的人，比你更加努力。」不可否认中国大陆不但拥有上游丰富材料资源，且积极发展中下游。早年靠劳力密集吸引外资驻扎，间接获取技术来源与人才；后期又靠资本雄厚走出去并购国外企业，直接攻城掠地获取生产设备以及技术专利。面临这样的竞争对手，台湾扣件产业固然为传统产业中的模范生，也需因应准备在下一个10年如何保有扣件业在全球市场出口龙头地位的策略，以下列三点观察建议。

(一) 产品持续升级转型

技术日新月异，从发电机到电脑，从工业初始到现今的4.0，虽螺丝螺帽属于传统产业，但可思考如何搭配

depreciation, the industry in the 2nd half of this year will continue to be conservative before investors regain their confidence in the market. The annual export value is estimated to slightly grow 2-5%, which may be a quite good result.

Quality and Value are Keys to Differentiating Taiwanese and Chinese Products

To compare the current fastener industries between Taiwan and China, there are nearly 10,000 fastener producers and traders in China with more than 1 million employees. In Taiwan, there are about 1,300 fastener producers and traders with nearly 30,000 employees. In terms of industrial scale, Taiwan is smaller than China. Chinese suppliers mainly supply fasteners of lower grades mostly for machinery, construction, and general industrial applications and the domestic demand for high strength/precision fasteners used in automotive and electronic appliances sectors relies on imports.

Taiwanese suppliers began the production of low carbon steel fasteners 30 years ago (earlier than Chinese competitors) and experienced the global economic crises twice. Some Taiwanese companies turned to invest abroad in 2000 while others staying in the homeland kept striving for business upgrade to improve their own techniques and elevate product quality. The year 2008 put them into another economic crisis again, but the business upgrade could be already observed in that year, making Taiwanese fastener industry turn from manufacturing standard parts to manufacturing higher grades of fasteners for European/U.S. car manufacturers and construction. In addition, Taiwanese suppliers also continue to research and develop new types of aerospace fasteners in various alloys and have even obtained certificates and trial orders from major aircraft manufacturers (Boeing, for example).

New Directions for Taiwanese Fastener Industry

A current popular saying goes, "The most terrifying thing in the world is to see someone who is better than you works harder than you do." It is true that upstream Chinese suppliers can offer many materials and the middle and downstream companies are also working harder than before. In the early years, China could attract foreign investments with its labor-intensive industries. During the time, it indirectly learned the techniques and obtained talented staff. Many years later, Chinese suppliers went to acquire foreign enterprises with abundant capital, getting lots of manufacturing facilities and technical patents. Facing the competition from China, Taiwanese fastener industry, as an exemplary model among other traditional industries, also has to figure out strategies to keep the leading position in global fastener export in the next 10 years. Below are 3 suggestions to achieving this goal.

a. Continuous Product Upgrade

Technology continues to be upgraded and invented (e.g., from the invention of power generator to the later invented computer, or, from the beginning of industrial revolution to the current Industry 4.0). Although the fastener industry is very traditional, the addition of automation and intelligent technology can be still taken into account. For example, British Rota Bolt has recently debuted its first bolt that can monitor the system on which it is installed and send alert immediately via emails or SMS to maintenance staff should there is a problem of tension loss. This bolt can also collect data on various bolts and transmit reports via WWW or GSM to its safety server to ensure protective measures are all in

自动化以及智慧化的趋势发展产品。如英国的Rota Bolt，推出全球首见在扣件产品本身安装远端无线监控系统，用以维持螺栓接合完整，若有数据异常可立即发布张力漏失警报，以Email或简讯方式送出给维修管理人员，并可同时收集多只螺栓数据，透过网路或GSM网路传送报告给安全伺服器，做好防护措施。台湾扣件大厂晋禾也积极研发感应螺丝，主要用于位移及松动等地方，包括桥梁、道路监控系统、大楼监控系统，甚至飞机的振动器和引擎的关键零组件上，还可用在精密设备、通讯及滤波器等用途；其最大特色为可透过光纤线感应外界变化，包括地震后桥梁断裂、土壤液化、预知山上及海水温度的变化等，早先预防降低损害。目前产品已向欧盟、美国、日本及台湾政府申请专利中，只要获得专利权即可进行量产。除了扣件智慧化之外，生技医材是另一个转型重点，如鸿君科技、庆达科技、全球安联等都是从传统螺丝厂转型研发人工牙根的经典案例。无论导入资通讯应用或转变扣件原有用途，产品的持续升级转型将可为扣件产业带来新出路，且附加价值提升通常就是单价提升的保证，可使台湾扣件与其他后进国家拉开差距。

(二) 检测设备可望搭上红潮

红潮来袭第一波备受威胁的其实是台湾的电子产业，中国大陆在LCD面板、LED照明、太阳能、手机制造等产业皆已逐渐展现国际竞争力，并购与产能等前端扩充动作不断，而对于后端提供的设备维护服务、检测服务与晶片设计相关故障分析、可靠度分析及讯号规格认证等内容的公司，将可望搭上红色供应链成长的大趋势。同理，台湾扣件生产检测伴随产业发展已久，与日德合作颇有心得，未来在红潮效应之下，不见得要与之为敌，而是化敌为友，导入台湾检测设备能量到中国大陆，也是产业策略的一种。

(三) 积极与国外进行购并、技术合作甚至开拓新战场

恒耀国际2014年收购欧洲三大汽车零件供应商的德国ESKA，其直接销售给德国三大车厂(宾士、BMW与福斯)之营收比重约占7成。近年中国大陆政府致力于汽车零组件在地化生产，在并购ESKA之后，让恒耀有机会能透过德国技术与客户关系，拓展中国大陆市场。但受限于扣件产业多为中小企业，不见得人人都有余力进行购并，且国际购并通常需要

place. Another Taiwanese leading fastener manufacturer Jinn Her is also active in developing similar screws, which are mainly used in areas with potential risks of displacement and loosening, including bridges, road monitoring systems, building monitoring systems, and even key components used on aircrafts or engines, as well as other applications for sophisticated equipment, communication, and wave filters. Its most significant feature is that it has optical fibers to sense outer environmental changes such as bridge cutoff, soil liquefaction, and abnormal temperature change in the mountain area or under the seawater in order to take precautions against damages. This product is now in application for EU, U.S., Japanese, and Taiwanese patents. If the product is patented, mass production will be soon started. In addition to the development of "smarter" fasteners, fasteners for biological and medical device industries will be another focus of business transition. HC Bio-S, Taiwan Shan Yin, Alliance Global Technology are all examples which were once traditional fastener manufacturers and later turned to the R&D of dental implants. The continuous upgrade of products (whether it is carried out with the introduction of IT/Communication applications or the change from the original application to another one) can pave a new way for the fastener industry. And, the increase in added values usually means the increase in unit prices, which could make Taiwanese fastener suppliers drag other competitors from other emerging countries further behind.

b. Inspection Equipment May Benefit from the Red Supply Chain

Taiwanese electronics industry is the first one which is facing this "red" trend. As Chinese LCD, LED, solar energy, and mobile phones industries are gradually showing their international competitive edge and continue to acquire other enterprises and expand capacity, other supporting companies providing facility maintenance & repair, inspection service & failure analyses of chip designs, reliability analysis & specification certifications may benefit from the growing red supply chain. For the same reason, the fastener inspection industry in Taiwan has established its own presence in related industries for so long and has many experiences in cooperation with Japanese and German companies. Under the influence of the red supply chain, you don't really have to be hostile to them. Transferring the advantages of Taiwanese inspection equipment to China can be also one of the industrial strategies.

两边政府机构许可或经由第三方股权收购，程序繁杂。目前高龄退休与第二代传承问题是不分国家地区的，台湾扣件厂与日德关系良好，未来可思考引进日德退休技师或退役设备进行研发以及技术传承，为下一个10年扎下更深根基。此外，往新兴市场拓疆辟土也是不可免的一环，主要贸易市场在各国重振制造业旗鼓之下，不免会有竞争，新兴市场因产业链不全而有切入空间，且国家发展初期生产需求最盛，如东协各国铁路建筑等基础工业至汽机车产业等，台湾扣件业者大有可为。

总而言之，红色供应链在产量及出口值傲视全球，但以扣件产业来说，其体质仍未健全，中间仍有可切入或区隔的生存空间。因此台湾厂商应从产品种类、品质做出区隔，且在技术提升上善用外在资源，如此才能迎战红潮，长久经营。

c. Being Active in M&A, Technical Cooperation, and Even New Business Expansion

In 2014, QST International acquired one of the 3 largest European auto parts suppliers- German ESKA (Nearly 70% of ESKA's revenue was generated from its direct sales to Germany-headquarted 3 largest car manufacturers- Benz, BMW, and VW). In recent years, Chinese government has been devoted to localizing production of auto parts. After acquiring ESKA, QST is now able to expand its business in China with German technology and its existing customer relationship. However, as most fastener suppliers are SMEs, not every one of them can acquire other companies. In addition, the international acquisition or merger usually have to be approved first by the authorities or must be acquired through the third party equity, which is very sophisticated. The problems of retiring at very old ages and 2nd generation succession happened in many countries/regions. Taiwanese fastener companies have good relationships with Japanese and German companies, so in the future, in order to consolidate the base for the next 10 years, hiring retired Japanese/German technicians or purchasing their facilities out of service may be taken into account. Expanding business to emerging markets is also inevitable. Major trade markets with promotion in reviving their own manufacturing will demonstrate competition for sure, and in emerging markets there show strong demand for manufacturing activities as they have not had a well-established industrial supply chain. If Taiwanese fastener suppliers focus on the infrastructure and railway construction in ASEAN, they can definitely do something good.

In general, the production volume and export value of the red supply chain take the lead around the world, but in terms of the fastener industry, it is still not mature yet and does leave space for further penetration and differentiation. As a result, Taiwanese companies should try to offer different product categories and quality and make the most of external resources to upgrade technology, in order to face challenges from the red supply chain and achieve sustainable operation.

References

1. *Import/Export Databank of Taiwan's Customs (2014-2015)*
2. *Databank of International Trade Centre*
3. *2015 Annual Guide for Metallic Products (Chapter: Fasteners), MIRDC*
4. *"The Invisible Champion- Jinn Her's New Detective Screw for Further Company Growth", May 2015, China Times*
5. *Analyst Research Report Snapshot, Reuters.*
6. *"When Chinese Finished Products are Cheaper than Taiwanese Materials- Dumping of Chinese Companies, Capacity Expansion, and Decline in Export of 6 Major Products", Sep. 2015, Taiwan's "Vision" Magazine*

参考资料

1. 2014-2015 海关进出口资料库
2. International Trade Centre统计资料库
3. 金属中心2015年金属制品年鉴-螺丝螺帽篇
4. 『隐形冠军－晋禾开发感应螺丝 成长新武器』，2015年5月，中时电子报
5. Analyst Research Report Snapshot, Reuters.
6. 『当中国产品比台湾原料便宜-陆厂倾销、扩产能，六大出口产品大衰退』，2015年9月号，远见杂志