Exploring the Changing Role of Chinese Entities in WMD Proliferation*

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Abstract

This paper seeks to provide an original examination of the nature of the proliferation of sensitive materials and technologies by Chinese entities. A number of publications have attempted to understand the issue of proliferation stemming from businesses based in China, with many having commented on the efforts undertaken both by international actors and by the Chinese government to prevent it. However, relatively few scholars have sought, in any systematic and sustained way, to understand the types of Chinese companies involved in proliferation and the evolution of their behaviour. This paper seeks to argue and account for the declining role of, and concern regarding, Chinese state-owned enterprise in the global proliferation problem. Different accounts for this change, and the relating proliferation challenge posed by China, are examined.

Keywords: proliferation; China; nuclear; missile; business; compliance; export controls; sanctions

The actions of entities based in China are often viewed as a significant challenge to the international community's efforts to prevent the proliferation of nuclear and other unconventional weapons.[1] China's non-proliferation record has certainly been mixed. Throughout the 1990s, numerous controversial transfers of sensitive technologies were documented, and Chinese entities have continually played a role in supplying the nuclear and missile programmes of Iran and North Korea, both of which have been subject to UN Security Council sanctions because of their threat to international security. Government officials have estimated that some 90 per cent of goods destined for those programmes travel through China.[2] Although many challenges remain, the past two decades have

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1 "Illicit" trade is used in this context to refer to business that may be illegal or technically legal but contrary to non-proliferation norms. National controls and legislation vary from country to country, which makes it difficult to classify business transactions as "illegal" or "legal."
2 Bowen, Stewart and Salisbury 2013.

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marked the beginnings of concrete commitments from China to conform to international standards to curb the spread of weapons of mass destruction (WMD).

This paper seeks to provide an original examination of the endurance and nature of the proliferation problem posed by Chinese entities. Whilst some studies have tackled the issue of China's illicit trade and the efforts to prevent it, including the adoption of export controls and sanctions, fewer scholarly contributions have sought to consider the types of Chinese entities involved in proliferation. Crucially, none has sought to characterize and explain how this has changed over time. Focusing on the factors that have influenced the behaviour of Chinese entities, we consider whether there has been, as appears to be the case, a decrease in the role of, and concern regarding, the involvement of Chinese state-owned enterprises (SOEs). We argue that this apparent decrease cannot be fully understood without undertaking a qualitative assessment of the evolving types and behaviour of Chinese entities. We also draw upon the literature regarding the opportunities and challenges faced by industries and governments in other countries when using export controls to prevent proliferation, and regarding the approaches of industries in China to risk management.

Background

Although China first acquired nuclear weapons and ballistic missiles in the 1960s, its role in onward proliferation of WMD-related technologies can, in large part, be first seen in the 1980s. Following on from Deng Xiaoping's 邓小平 efforts to modernize the economy, there was a change in the role played by the transfer of arms and, more broadly, strategic technologies. Before 1978, most transfers were to other revolutionary states and strategic allies; however, in later years, foreign arms transfers were apparently indiscriminate and were exploited to revive the Chinese economy and fund the military modernization of the People's Liberation Army.[3]

Several high-profile and controversial transfers of WMD-related technologies took place in the 1980s and 1990s.[4] The more controversial of these involved transfers to Pakistan's weapons programme and included the alleged transfer of weapons design information.[5] In 1987, the DF-3s China sold to Saudi Arabia were the longest range nuclear-capable missiles held by a country without permanent membership of the UN Security Council. Technology and highly enriched uranium were transferred to a nuclear reactor in Algeria not covered by International Atomic Energy Agency safeguards and which was constructed with Chinese help.[6] Numerous allegations were also made regarding the transfers

3 Bowen 1999, 16.
4 Kan 2015.
5 National Security Archive 2013.
6 Albright and Hinderstein 2001.

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of missile technologies to Pakistan and North Korea, and chemical weapons-related material to Iran.

However, the 1990s also represented something of a watershed in terms of Chinese attitudes to non-proliferation, with the first concrete commitments from China to conform to international standards to curb the spread of WMDs. In 1991, China agreed to abide by the Missile Technology Control Regime (MTCR) guidelines for missile-related exports and, in 1992, it acceded to the Nuclear Non-proliferation Treaty. Throughout the 1990s, China made further international commitments: it signed the Chemical Weapons Convention in 1993 (ratified in 1997), joined the Zangger Committee in 1997, and in 1998, supported the UNSCR 1172, which encouraged states to prevent the export of equipment, materials or technology of use in the nuclear or missile programmes of India and Pakistan following their nuclear tests.

The transformation of China's export control system and the principles that govern licensing decisions have been well documented in the academic literature.[7] Nonetheless, China's implementation both of these controls and of international commitments remains controversial. Throughout the 2000s, analysts regarded the Chinese government's record of enforcement as the weakest point in the country's controls, and this area continues to draw criticism.[8] Explanations for the gap between commitment and implementation have included geopolitics, for example Chinese interests in Pakistan and the Middle East;[9] issues surrounding the "interpretation" and legitimacy of the controls;[10] and domestic issues such as "overlapping jurisdictional claims, unclear designation of lead agencies to prosecute violations, and bureaucratic wrangling."[11] In order to understand the evolution of China's approach to the implementation of export controls, it is important to appreciate the interconnections between these controls and the changes to China's strategic technology industries, which are considered in the next section.

China's Evolving Strategic Technology Industrial Base

The elements of Chinese industry that currently hold "strategic technologies" are different from those of 20 to 30 years ago. In this context, "strategic technologies" refers to technologies which could contribute to a WMD programme.[12] Historically, these technologies have been the preserve of large SOEs with strong ties to the Chinese government and military, and ultimately to China's strategic weapons programmes. Private enterprises manufacturing or dealing in such proliferation-sensitive technologies are a newer and increasingly significant

7 Medeiros 2005; Yuan 2002a; Bulkeley 2004; Yuan, Saunders and Lieggi 2002.
8 See, e.g., Medeiros 2005; Huang 2012.
9 Paul 2008.
10 Yuan 2002b.
11 Srivastava 2005.
12 Note that many of the technologies which could be of use in such applications are "dual-use" and could also be used in the defence industry or civil applications.

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development. Generally speaking, they have fewer, and less obvious, direct connections to the Chinese government.

Since 1978, China has implemented a series of wide-ranging and gradual market reforms to enable the state to make the transition away from a Stalinist model economy towards a socialist market economy and open up the way for individuals and firms to engage in private shareholding.[13] China's industrial capability has increased exponentially as a consequence of these reforms.[14] This economic change has, in turn, had a significant impact on the strategic technology base, and hence the types of Chinese entities which could pose a proliferation risk.

China's economic transformation

The economic changes initiated by Deng Xiaoping involved significant efforts to reform the SOEs. These reforms came in two distinct phases: the period between 1978 and 1992, which focused on "improving enterprise governance through allowing greater managerial autonomy and accountability," and that after 1992, which saw incorporation of more "modern styles of management."[15] During the latter stage of reform, SOEs were consolidated, and were further reduced in number into the 2000s. The number of SOEs in 2009 was an eighth of the number in 2000.[16]

The economic transition was accompanied by the growth of China's private sector. Private enterprise was first "legitimized" in 1988, but the privatization of state enterprises and the growth of new private enterprises have faced numerous difficulties, not least the prohibitive burdens of profit collection placed on the state-owned sector by the government.[17]

The non-state sector, however, continued to develop in the 1990s and, from 1998 to 2010, the number of state-owned and state-controlled enterprises decreased from 64,700 to 20,300, whilst the number of private industrial enterprises increased from 10,700 to 272,300.[18] The increase in the number of private industrial enterprises over the course of the 1990s and 2000s was coterminous with, and was accelerated by, China joining the World Trade Organization (WTO) in 2001, which marked a watershed in China's economic development.

The presence of SOEs in China's economy is fraught with complications, and they continue to play a hugely important role. For example, although reduced to a fraction of their original number, 90 per cent of the sales revenues of China's top 100 enterprises in 2011 were collected by SOEs.[19] State-owned firms have

13 White, Howell and Shang 1996.
14 Holz 2008.
15 Yu 2014, 163–64.
16 Cheong et al. 2014, 137–38.
17 For the growth of China's private sector, see So 2002, 360. For the associated challenges, see Green 2003, 3; So 2002, 361.
18 Hu 2012. Hu Angang. 2012. "China's economy must advance on two legs: private, state-owned," *China Daily*, 15 May.
19 Yu 2014, 165.

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benefited since the 1980s from favourable conditions created by enterprise groups, sometimes referred to as the "national champions."[20] There are still 111 "central" SOEs listed under the administration of the State-owned Assets Supervision and Administration Commission (SASAC),[21] and recent accounts have noted that the SOEs are becoming "wealthier and more powerful."[22] As they have expanded, many have diversified their activities and now compete with foreign multinational corporations in many business areas.

Characterizing Chinese industry today is challenging, with the picture more complex than the often portrayed state–private dichotomy.[23] There are other categories of firms subject to state involvement, with varying levels of administration and share-holding. A recent study notes three main components of the Chinese state sector: first, enterprises that are fully owned by the state through the SASAC of the State Council and the SASACs of provincial, municipal and county governments; second, SOEs that own majority shares in enterprises that are not themselves formally considered to be SOEs but are nonetheless controlled by the SOE or the state directly, which holds significant shares, i.e. state-holding enterprises or subsidiaries; third, entities based both within China and without, and owned and controlled, albeit indirectly, through SOE subsidiaries. It is clear that the picture of China's economic development is an increasingly complex one; the same holds true for China's strategic industries.[24]

Strategic industries

The history of China's development of "strategic industries" is inseparable from China's economic transformation. In this context, the term "strategic industries" is used to refer to the companies in China that are capable of producing "strategic technologies." There is, however, a distinction to be made between the use of the term in this context, and its use by the Chinese government when referring to the seven "strategic" sectors identified for economic growth.[25]

"Strategic technologies" encompasses a diverse set of materials and components that is generally of higher specification and quality. A few examples of these products include certain types of high-strength alloys, composites, certain valves, electronic components, and sensors.[26] In practical terms, there are great overlaps between the manufacturers of these goods and those that supply the defence, nuclear, aerospace and space sectors.

20 Nolan 2001.
21 Sasac.gov.cn. 2015. "Yang qi ming lu" (List of central enterprises), undated, http://www.sasac.gov.cn/n86114/n86137/c1725422/content.html. Accessed 25 August 2015.
22 "New masters of the universe," *The Economist*, 21 January 2012, http://www.economist.com/node/21542925. Accessed 25 August 2015.
23 Cheong et al. 2014.
24 Szamosszegi and Kyle 2011.
25 Xinhuanet.com. 2010. "China to nurture 7 new strategic industries in 2011–15," 27 October, http://news.xinhuanet.com/english2010/china/2010-10/27/c_13578293.htm. Accessed 25 August 2015.
26 A good overview is provided in the lists of the Nuclear Suppliers Group and the Missile Technology Control Regime.

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China's manufacture and export of these types of goods has historically been concentrated in the state-owned sector, largely in defence, nuclear or aerospace firms. The pre-2002 "administrative controls," a legacy of central planning, meant that only certain state-owned firms could export military and sensitive goods.[27] For example, there are still currently just 11 companies which are permitted to export arms.[28]

This picture has been more complex in recent years. The defence SOEs, as with other industrial sectors, have also been subject to iterative reforms, albeit slower and weaker in nature than in other sectors, reflecting the special status of these industries.[29] The opening up of Chinese markets has also diversified the types of actors holding strategic technology in China. China's WTO admission in 2001 saw "a steady growth in the number of dual-use producing industries basing manufacturing operations in China to serve markets in the country and abroad."[30] This, and efforts to "promote the commercialisation of scientific research outputs" amongst private enterprises, ongoing since the mid-1980s, have, among other factors, meant that the private sector in China is now a significant holder of sensitive, and especially dual-use, technologies.[31]

The changes in the strategic industries in China have clearly impacted on the types of actors that could be involved in supplying a WMD programme. As Chinese non-proliferation scholars have noted:

> China's economic transition underlines the urgency of strengthening export control … This makes the export of sensitive items and technologies unprecedently complex: on the one hand, there are a growing number of Chinese companies involved in export trade, including not only the state-owned enterprises, but also a large number of private businesses, research institutes, joint ventures and foreign-funded enterprises.[32]

The Changing Behaviour of Chinese Entities

The 1990s and 2000s witnessed significant changes in the proliferation behaviour of Chinese entities. Over time, there has been a decreasing involvement of, and concern regarding, Chinese SOEs in illicit trade. A variety of sources illustrate this changing behaviour, both in terms of reduced illicit transfers and in terms of SOEs taking compliance activities and processes more seriously.

The difficulty in assessing patterns in illicit activities, including involvement in supplying WMD programmes, is that individual cases cannot be contextualized because a full dataset is not available. However, it is apparent that three interlinked changes can be seen in the role of Chinese entities in the proliferation problem. First, more broadly, although difficult to quantify, there has been a decline in the involvement of Chinese entities in proliferation. Second, while many of the

27 Medeiros 2005, 11.
28 CACDA and Saferworld 2012.
29 Medeiros et al. 2005.
30 Srivastava 2005.
31 So 2002, 361.
32 Li, Genxin, and Sun 2007, 91.

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cases in the 1980s to early 2000s involved state-owned entities, there is evidence that this is less the case in recent years. Third, the type of technologies that Chinese entities are willing and able to supply has also changed; rather than complete reactors, missile systems and production lines, most transfers are of constituent parts, especially dual-use technologies.[33]

A qualitative assessment of historical cases available in open sources supports these conclusions. In terms of the actors involved, many of the transfers up to the mid-2000s involved SOEs. Notable were the activities of a number of state-owned "serial proliferators," which included the China North Industries Corporation (NORINCO) and China Precision Machinery Import–Export Corporation (CPMIEC).[34] Other examples of SOE involvement include the implication of the China National Nuclear Corporation in the transfer of ring magnets to Pakistan in the 1990s, and the Great Wall Industry Company in missile proliferation to Iran in the 1990s and 2000s. More recently, however, open sources suggest that there has been a remarkable decline in reports of state-owned involvement in the latter half of the 2000s.

Since the mid-1990s, but more so in the 2000s, actors from the private sector have also been involved. In some senses, their involvement has been less well documented than that of the SOEs. Private sector actors include individuals, playing the role of middlemen, and small and medium private manufacturing and distribution companies. Businessman Li Fangwei 李方伟 has been perhaps the most prolific operator in recent years. Since the early 2000s, he has run a network of front companies, and has been described as a "principal supplier" of Iran's missile programme.[35]

The change in the types of goods transferred reflects a number of factors: China's international commitments, its increased commitment to abide by them, and the types of industry involved. Complete reactors, missile systems and production lines have been, and continue to be, the preserves of the large SOEs. Their transfer, as in the current Pakistani reactor sales, may form a part of strategic relationships (as a response to the US–India nuclear deal, for example) and be subject to careful planning by higher echelons of government, rather than being a sign of industry and government commitment to China's international obligations.

Conversely, dual-use technologies, which can form parts of these full systems and manufacturing capabilities, are far more difficult to regulate, being of use in a diverse set of applications. Some of the dual-use goods of use in a WMD programme, such as certain types of industrial control systems, are so commonly used in industry that controlling them would put too much of a burden and constraint on international trade. Therefore, these types of goods, rather than

33 A key exception here would be the supply of Chinese reactors to Pakistan, although this could be seen as a response to strategic competitor India's Nuclear Suppliers Group exemption.

34 DeSutter 2003.

35 United States District Court in the Southern District of New York. 2014. "United States of America against Li Fang Wei," 28 April, http://www.justice.gov/usao/nys/pressreleases/April14/LiFangweiIndictmentPR/Li%20Fangwei%20in%20Rem%20Complaint%20and%20S1%20Indictment.pdf. Accessed 25 August 2015.

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complete systems, are more likely to be available from the growing number of private sector entities.

Targeted sanctions imposed by the US

China's involvement in the transfer of sensitive technologies may be viewed, albeit problematically, through the lens of US impositions of "non-proliferation sanctions." The term "sanctions" has a wide variety of different meanings. At the strategic level, sanctions are comprehensive "economic weapons" used "to wage a nonmilitary campaign, extending the diplomatic process beyond verbal negotiations."[36] The "non-proliferation sanctions" being referred to here are a further subset of the sanctions toolset and have frequently been imposed against entities by the US government for their alleged involvement in illicit trade. They involve a given entity being publicly listed as "sanctioned," with certain limits put on their business activities such as commercial activities with the US government, or other US entities. In practice, however, the sanctioning of a company can have broader effects on their business. Many large international companies screen potential customers and business partners against US lists and may, depending on specific context and risk appetite, avoid transactions with sanctioned entities even if they do not contravene the law.

The objectives of these "non-proliferation sanctions" have been described as fourfold: deterrence, constraint, coercion and action.[37] Sanctions – in theory – should affect the behaviour of the sanctioned party in the following ways: deterring the sanctioned entity, and the broader business community, from involvement in proliferation; they should also constrain or "reduce [an entity's] ability to make further contributions to proliferation"; and they should also coerce or "secure improved behaviour."[38] In practice, sanctions aim "to placate domestic groups who insist that the U.S. government 'do something' to address foreign misdeeds."[39]

As these four objectives indicate, sanctions have a number of audiences. In the Chinese context, they may (if the US intelligence upon which they are based is correct) be indicative of the target's behaviour. However, first and foremost, they are a product of the US government's understanding of proliferation concerns, and its domestic bureaucratic and political processes. As such, US sanctions against Chinese entities are telling: they highlight prevailing US concerns about the types of entities involved in proliferation.

The graph in Figure 1 shows the instances where non-proliferation sanctions were imposed on Chinese entities between 1990 and 2014.[40] The 1990s marks

36 Eyler 2007, 4.
37 Speier, Chow and Starr 2001, 3.
38 Ibid.
39 Gary Clyde Hufbauer and Elizabeth Winston, quoted in Speier, Chow and Starr 2001, 3.
40 Data available in the Federal Register. A good overview of non-proliferation sanctions of Chinese entities is supplied by Kan 2015. The graph details sanctions focused on entities based in mainland China (those in Hong Kong and Macau have been omitted because of their separate export control systems) and does not include Chinese subsidiaries of non-Chinese firms.

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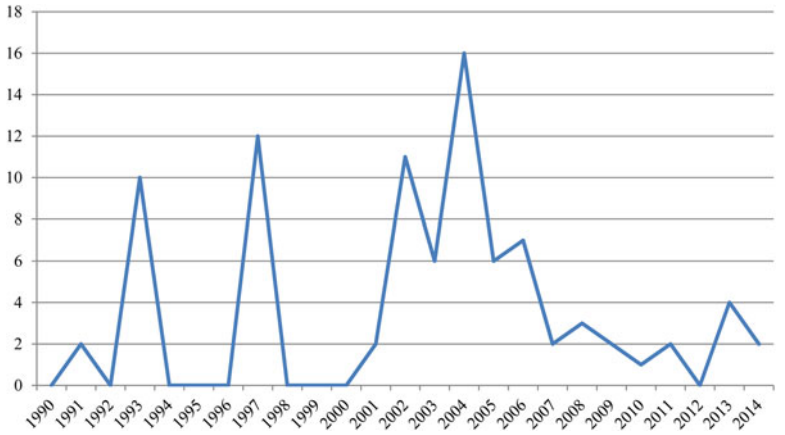
Figure 1: **US Non-proliferation Sanctions Imposed on Chinese Entities, 1990–2014**



Notes:

Where multiple sanctions based on different legislation were imposed on one entity, only one entry was made (some sanctions lasted multiple years). Entities allegedly operated by a single individual were counted once.

the start of US deployment of "non-proliferation" sanctions in this form. The early sanctions were imposed for involvement in the proliferation of missiles and chemical weapons. The peak in sanctions in 1993 was coterminous with the Clinton administration's sanctions in response to the supply of M-11 ballistic missiles to Pakistan in 1991 and 1992, and spare parts the following year.[41] A second peak in 1997 relates to the sanctioning of a number of Chinese firms for supplying an Iranian chemical weapons programme, reflecting US intelligence concerns at the time.[42]

The approaches to sanctions taken by different administrations can be seen in the graph. Comparatively-speaking, Clinton used sanctions more reluctantly "to complement [our] diplomacy."[43] Demarches were much preferred.[44] As a top Clinton administration official noted, "Sanctions have a key role. Nobody likes them much."[45]

Further reflective of US bureaucratic politics, the sanctions levied against Chinese entities in 1993 related to transfers of MTCR "Category II" items, even though allegations made in the press related to the transfer of "Category I" full systems.[46] Critics alleged that "delaying tactics, re-writing reports, and setting high evidentiary standards" prevented the imposition of more stringent Category I sanctions.[47] A report by the Senate Foreign Relations Committee noted that the

41 Milhollin and White 1991; Gertz 1994.
42 Director of Central Intelligence 1996.
43 Davis 1996.
44 Holum 1999a.
45 Holum 1999b.
46 Scherr and Dybvik 1992.
47 Kan 2006, 6.

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administration had employed "bureaucratic manoeuvres" to delay the production of "findings of fact" by the intelligence community, and did not schedule the required interagency meetings to assess findings.[48] The director of the CIA's Nonproliferation Center noted that a lack of legal flexibility could result in officials behaving like a "defense attorney working to undermine the evidence indicating a transfer has occurred."[49]

Similarly, US domestic and bureaucratic politics can explain the graph from 2001 onwards. The period more generally was characterized by the climate following the events of 11 September 2001 and US government responses to terrorism. There was also increased awareness surrounding proliferation, especially following the announcement of Iran's covert nuclear work in August 2002.

John Bolton, undersecretary for arms control and international security affairs (May 2001–July 2005), was responsible for the increase in sanctions, bringing to the State Department a number of Republican congressional staff who shared his views on their utility.[50] He worked methodically to reinvent the non-proliferation regime, "crafting policies to fill gaping holes, reinforcing earlier patchwork fixes … and changing perceived realities and stilted legal thinking."[51] Within three years of taking office, the imposition of sanctions increased by "about 400 percent."[52] The role of these individuals and their approach to sanctions is amongst the most important factors in interpreting the graph.

The end of Bolton's tenure saw a change in personnel, evolving priorities and new legislation, which can all explain the declining use of these non-proliferation sanctions on Chinese entities. Bolton's successors certainly placed less emphasis on this non-proliferation tool.[53] Of the sanctions imposed, more were financial-based and implemented by the Treasury. These constituted half of all sanctions against Chinese firms between 2006 and 2008, their imposition being "procedurally and bureaucratically easier."[54]

Types of Chinese entities targeted

The quantitative view is undeniably problematic and yet it does reflect subtle nuances in the evolution of the Chinese proliferation problem. Reliance on this data largely – and relatively accurately – illustrates the preoccupations of US domestic and bureaucratic politics. However, when broken down by entity type, the dataset does suggest a shift in US concerns away from the state-owned sector and towards the private sector. This, in and of itself, is revealing. As discussed, drawing up a typology of Chinese industry is not easy. However, basic

48 Ibid.
49 Gordon G. Oehler, quoted in Speier, Chow and Starr 2001, 54.
50 Boese 2008.
51 Bolton 2004b.
52 Bolton 2004a.
53 Boese 2008.
54 Ibid.

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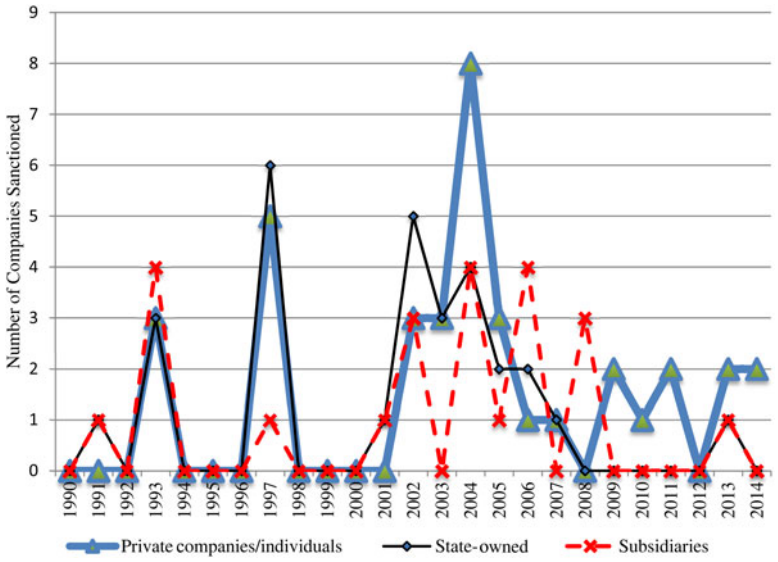
Figure 2: **Types of Chinese Companies Sanctioned per annum, 1990–2014**



Notes:

Where multiple sanctions based on different legislation were imposed on one entity, only one entry was made. Entities known to be operated by a single individual were counted once.

categories have been used to map out the historic instances of US sanctions being imposed. Figure 2 represents a survey of sanctions imposed on Chinese entities from the state-owned, SOE subsidiary and private sector.

Dividing the data according to business types loosely supports the conclusions drawn regarding the changes in the types of Chinese firms involved in proliferation. The early peaks of sanctions in 1993 and 1997 comprise a fairly evenly distributed mixture of types of actors involved in proliferation.

Corresponding with the export control changes of the early 2000s, there is a clear decline in the sanctioning of Chinese SOEs. From 2002 onwards, sanctions placed on the state-controlled sectors gradually decline to almost zero from 2009 to 2014. A similar, although less obvious, decline in sanctions on SOE subsidiaries is also visible from 2006 onwards, with oscillating peaks that tail off towards 2009, after which, like the state-owned category, no sanctions are imposed until 2013. The same overall trends of improvement are not discernable in the private sector.

Again, the data have limitations. Clearly considering the number of sanctioned entities has no bearing on the significance of the companies' activities. Similarly, within the private sector the number of sanctioned entities is not actually that great. While a large number of entities have been sanctioned since 2008, these have largely been focused on the activities of a single businessman, Li Fangwei.

It is clear from both open sources and the sanctions data presented above that there has been a change in the role of Chinese entities in proliferation. Evidence

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suggests that large SOEs are less involved in the illicit trade of sensitive technologies than they were in the 1990s and early 2000s. As US assistant secretary of state Thomas Countryman noted at a May 2015 hearing, "over the last 15 years or 20 years … what we've seen is that Chinese state-owned enterprises are out of the business of proliferating technology to North Korea and Iran" and instead this role has been assumed by "a very dynamic, very high-tech private sector."[55]

Explaining Behavioural Change

It is clear that the proliferation problem has shifted in a manner both reflective of China's developing industry and evolving national non-proliferation stance. The development of the private sector as a source of proliferation-sensitive goods has already been discussed. This section considers behavioural change – especially amongst the SOEs – in more depth. It draws on the policy implementation and Chinese industry compliance and risk management literature, and experience elsewhere, to contextualize the described changes.

Export controls and compliance

In 2002, China transitioned from an ad hoc, "administrative" export control structure to a legally underpinned, institutionalized system. The new system was implemented on the basis of the promulgation of a raft of non-proliferation and export control legislation by China's State Council, and was widely acknowledged as a significant step forward. It has been suggested that the emphasis on "a new export control dynamic"[56] allowed China to move beyond previous policies and rhetoric,[57] and is indicative of the country's "conscientious effort to adapt to internationally accepted standards and practices."[58]

Whilst China's promulgation of new legislation certainly was a positive step, in order for controls to be effective, industry needs to be compliant. Practically, this means applying for or ensuring that firms hold export licences permitting the export of goods to a certain end user. The licence is granted by the licensing authority – which in China is in most cases a section of the Ministry of Commerce (MOFCOM) – subject to the conclusions drawn through an inter-departmental process.[59] Licensing decisions in China, as in other countries, are judged on the basis of China's international obligations and foreign policy goals.

More recent non-proliferation literature has highlighted that compliance with export controls alone does not prevent proliferation. Going beyond compliance is

55 Countryman 2015.
56 Srivastava 2005, 6.
57 Lieggi 2003.
58 Yuan 2002a, 215.
59 As in other countries, other government agencies are also involved in licensing certain types of goods. China has recently been restructuring its export licensing function.

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sometimes necessary in this regard.[60] Beyond-compliance measures are particularly important in cases where non-controlled goods – which still can be of use in WMD programmes – are involved, and where entities successfully deceive exporters and national authorities. However, while compliance is in some regards not sufficient, it is a necessary starting point.

With this in mind, a number of large Chinese SOEs – including several described as serial proliferators in the past – have put in place internal compliance programmes (ICPs) to ensure that they do not breach national, US and other regulations. These systems have many similarities with those put in place by other companies in other countries. Best practices and efforts to share them have been increasing around the world. Similarly, a number of compliance officials in Chinese companies have travelled to the US and Europe for training and discussions with industry counterparts and governments.

Initial interest in ICPs came from SOEs around the time the new regulations were introduced in 2002.[61] NORINCO paved the way in compliance by taking a "different" response to sanctions, putting in place an ICP, and "touting" its non-proliferation credentials.[62] In 2008, a NORINCO executive stated that the company could "serve as an educator and lobbyist on the subject of export control compliance."[63] NORINCO's work has certainly encouraged other SOEs to implement ICPs.

It is undeniable that changes in SOE behaviour are in response to top-down directives regarding Chinese government non-proliferation policy. There have clearly been some joint efforts between SOEs, government departments and quasi-governmental organizations to effect these changes.[64] There are also, in theory, direct routes for policy dissemination amongst senior management, who are in many cases senior Party members. For example, in 2013, 17 prominent political leaders held positions in SOEs, and 27 SOE bosses were also central committee members.[65] There are also a number of other dissemination routes to executives, for example the cadre transfer system of the *nomenklatura*.[66] All executives in large SOEs that are appointed by the Party can incentivize the pursuit of stated policy goals. A 2011 report on banking notes that, "if maximizing shareholder value conflicts with state goals, SOEs and their wholly-owned subsidiaries are likely to pursue the goals of the state."[67]

However, context, the relative importance given to non-proliferation policy, and competing interests (especially involving the military), mean that conflicts

60 Salisbury 2013.
61 Medeiros 2005, 86.
62 Lieggi 2010, 45.
63 US Embassy Beijing. 2008. "Visiting StaffDel meets NORINCO officials," 31 March, Cable No.08BEIJING1203, http://wikileaks.org/cable/2008/03/08BEIJING1203.html. Accessed 25 August 2015.
64 US Embassy Beijing 2007.
65 Yu 2014, 175.
66 Brødsgaard 2012, 625.
67 Szamosszegi and Kyle 2011.

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may not always be resolved in favour of non-proliferation or national policy. The literature on policy implementation in China provides some insights into the difficulties of implementing export controls. Since 1978, a number of factors – including decentralization, the decrease of ideological policy, and a reduced scope for coercion – have meant that policy implementation involves increased bargaining and compromise not necessarily conducive to regulatory enforcement or compliance.[68] A 2011 Chinese study notes that while political connections can certainly have a role in determining management behaviour, context is important in determining how, with Party elites often using SOE positions as a vehicle for personal progression.[69]

Insights from the compliance and risk management literature

The compliance and risk management literature provides useful bottom-up insights into what drives industry to comply with regulations and also put in place beyond-compliance systems and processes. Whilst largely focused on other topic areas, there have been efforts to apply these insights to non-proliferation and export controls.[70] Two principal schools of thought dominate this literature. The first has its basis in a deterrence model: that entities are compelled to comply by the threat of non-compliance penalties. These are negative drivers of compliance.[71] These accounts often imply that entities' choices – to be compliant or not – centre around three factors: the perceived likelihood of punishment, the likely costs of punishment, and the pay-off for undertaking an activity.[72]

This cost–benefit view of compliance has some traction in the Chinese case. The threat of US sanctions is clear to many Chinese firms, and is clearest to those large SOEs which export strategic technologies, have a diverse product base, see the potential to make significant profits from international and especially US markets, and hence have more to lose. US non-proliferation sanctions can include a prohibition on contracts with the US government and on trade with US companies. However, the effects of US sanctions are not confined to US markets – they have a ripple effect in terms of reputation and fear, making firms around the world which deal with US markets reluctant to deal with sanctioned companies.

Sanctions have had a significant impact on Chinese SOEs. Take, for example, NORINCO's US exports, which dropped $100 million a year under sanctions, and reached almost $70 million in 2009 after sanctions were lifted in 2007.[73] NORINCO officials reported that sanctions cost the company $200 million up to 2006.[74] In discussions between NORINCO and US government officials,

68 Lieberthal and Lampton 1992.
69 Du, Zeng and Du 2011.
70 Salisbury 2013.
71 May 2004.
72 Piliavin et al. 1986.
73 Wilkins 2009.
74 Center for Nonproliferation Studies 2006.

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NORINCO officials acknowledged that sanctions had caused them a lot of trouble.[75] Representatives from other SOEs have noted that it was the imposition of US sanctions that first triggered their company's interest in establishing an ICP.[76]

The increasing diversity of products produced by many SOEs is helpful in this regard. While NORINCO was initially sanctioned for illegal AK-47 shipments to the US and goods to Iran's missile programme, its goods for the US market after sanctions were lifted included "solar lanterns implanted in gardens and driveways" and "wind turbines and blades."[77]

More broadly, in the scholarly literature on industry compliance, explanations centring on a cost–benefit analysis have been viewed as having limited explanatory value. Many of these limitations clearly apply to the Chinese context. In such accounts, businesses are framed as unitary and rational actors. To consider Chinese state-owned enterprises as unitary actors is grossly simplistic. In this context, rationality is also linked to the view that businesses are profit-maximizers – entities for which the dominant or only goal is making as much profit as possible. This is also not always the case.

Examples show that company officials can act without authorization, or with only tacit approval, from superiors. One instance suggests that a case involving the transfer of ballistic missile guidance components to Iran, which allegedly involved CPMIEC, was in fact carried out personally by a named "CPMIEC Official."[78] A second example suggests that one NORINCO employee responsible for the firm's sales to Iran, who was angry to see his bonuses disappearing, was "causing lots of trouble" which eventually led senior management to step in.[79] These examples highlight the difficulty of building ICPs in such large organizations with multiple subsidiaries, divisions and facilities. Most of the large Chinese SOEs which produce sensitive technologies have many subsidiary companies, separate manufacturing divisions, and thousands of employees.

In terms of negative drivers of compliance in Chinese industry, despite the clear risk posed by US sanctions, there is no similar narrative involving the risk of penalties on the Chinese government side. In countries that have more mature export control systems – for example, the UK – "there is far from a successful and on-going communication of a narrative, which would support the case for deterrence."[80] This is even more the case in China where only a handful of prosecutions have been publicly reported.[81] In May 2004, MOFCOM published information about fines against two companies without specific

75 US Embassy Beijing 2007.
76 Confidential correspondence, Chinese SOE compliance official, March 2015.
77 Wilkins 2009.
78 Secretary of State. 2006. "Response to China on E.O. 13382 designations; new information on CPMIEC," 28 June, Cable No.06STATE106928, http://wikileaks.org/cable/2006/06/06STATE106928.html. Accessed 25 August 2015.
79 US Embassy Beijing 2007.
80 Salisbury 2013, 543.
81 Lieggi 2010.

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details.[82] Between 2006 and 2008, details of three further cases were released, featuring company names, details of the goods and fines; however, no further actions have been publicly recorded, and suggestions that CPMIEC executives have been imprisoned for non-proliferation-related offences have not been confirmed officially.[83]

Perhaps the greatest difficulty with a deterrence-based view of compliance is caused by regarding companies as "amoral calculators."[84] By looking at compliance only through a cost–benefit lens, a key element of the equation is missing – that relating to corporate social responsibility and reputation. In this respect, the compliance literature describes "societal pressure" acting as a "social licence" and helping to motivate compliant behaviour.[85]

There is clear evidence of these factors playing a growing role, albeit a less important one than the risk posed by US sanctions, in the Chinese case.[86] For example, a NORINCO executive has noted that the company wants to be seen "internationally as a responsible player."[87] Similarly, in discussions in 2008, a NORINCO executive cited the will to shed the "distorted image" of the firm and become "a decent member of the international community" as reasons for implementing an ICP.[88] The ICP was described as an "obligation owed by NORINCO Group's 700,000 employees to the Chinese Government."[89] That reputation acts as a driver can be seen in the compliance statements and news articles regarding recent export control training events which are now seen on the websites of large SOEs.[90] However, such notions should be considered in light of the difficulty that SOE compliance officers often have in obtaining support and resources from senior management for their ICPs.[91]

Some of the conclusions drawn above are supported by findings in the literature on Chinese risk management and industry compliance in other countries. A 2003 survey of over 500 Chinese companies concluded that larger companies were likely to take a greater interest in compliance and corporate social responsibility, and were more willing to disclose such activities.[92] A 2005 regional study

82 Peopledaily.com.cn. 2004. "Two Chinese companies fined for violating regulations on missile export control," 26 May, http://english.peopledaily.com.cn/200405/26/eng20040526_144379.html. Accessed 25 August 2015.
83 Center for Nonproliferation Studies 2006.
84 Kagan and Scholz 1984, 67.
85 Lynch-Wood and Williamson 2007, 321.
86 Suggested by a participant at the "Industry outreach workshop on non-proliferation and compliance," Qingdao, 27–28 February 2012; confidential correspondence, Chinese SOE compliance official, March 2015.
87 Center for Nonproliferation Studies 2006.
88 US Embassy Beijing. 2008. "NORINCO briefs embassy on its export control compliance efforts," 31 March, Cable No.08BEIJING1201, http://wikileaks.org/cable/2008/03/08BEIJING1201.html. Accessed 25 August 2015.
89 Ibid.
90 See, e.g., Norinco.com. 2014. "NORINCO corporate statement on nonproliferation, export control, and internal compliance," 1 January, http://www.norinco.com/GB/61/99/101/283.html. Accessed 25 August 2015.
91 Confidential correspondence, Chinese SOE compliance official, March 2015.
92 Li, Zheng 2006.

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also suggests that large and medium-sized companies were more likely to be aware of corporate social responsibility issues than small companies.[93] These studies corroborate the above conclusion that large SOEs have taken more of an interest in export controls and ICP implementation. However, data collected during the same 2003 study were unable to show a relationship between a company's ownership (state or private) and compliance interest.[94]

Another in-depth study involving 137 employees of "oversize" SOEs provides more details regarding the current state of risk management practices. The survey was conducted among employees with a wide range of functions, albeit none working specifically in the legal or compliance area. The 2011 survey suggests that the benefits of systematic approaches to risk management were not appreciated, with only 33 per cent responding that good risk management can increase corporate value, 12 per cent responding that it is useful for fulfilling compliance obligations, and 7 per cent responding that it can give companies a competitive advantage.[95] The author of the study found it "especially astonishing" that no respondents believed risk management could decrease management costs.[96] These results go some way to explaining why it is often difficult for those working on compliance issues at SOEs to gain senior management support and resources for their efforts.

Interesting and supportive comparisons can also be drawn from industry's compliance with export controls in other countries. A 2013 study, which included data from a 2011 industry compliance survey and interviews in the UK, found little evidence to suggest that compliance officials consider "compliance with sanctions and export controls in a mere cost–benefit manner."[97] While penalties were important, social factors such as reputation were often more important, especially in cases where firms were to go "beyond-compliance."[98] Similarities are also found regarding the importance of the fear of being blacklisted by the US government, especially amongst UK and transnational firms supplying the US defence and aerospace markets. Over a quarter of companies surveyed responded that the fear of being blacklisted was a main driver of their compliance beyond the basic national legal requirements.[99] It is clear that amongst other elements of Chinese private enterprise, companies that have strong connections to the US, in terms of business or ownership, often have the most rigorous compliance programmes in place.[100]

Compliance costs can be extensive and varied, and, for example, relate to the costs of turned down business and setting up and maintaining an ICP. These

93 Zhou 2011.
94 Li, Zheng 2006.
95 Zhou 2011.
96 Ibid.
97 Salisbury 2013, 543.
98 Ibid.
99 Ibid.
100 Company presentation, "Non-proliferation and export compliance outreach workshop," Dalian, 28–29 November 2012.

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costs are more important in terms of the extent to which a company can resource its compliance efforts, rather than its motivations to comply.[101] The large Chinese SOEs, like the large defence and aerospace conglomerates in the UK and elsewhere, certainly have more resources to put into their compliance efforts. As in the UK, smaller Chinese firms often have difficulty obtaining the resources for compliance, finding it burdensome and challenging.[102]

Effectiveness of Sanctions

These conclusions provide an interesting lens through which to consider the effectiveness of sanctions in affecting behaviour at the enterprise level. In the Chinese case, it is useful to distinguish between those companies which have been sanctioned on a one-off basis, suggesting that the sanctions may have caused a behavioural change, and the so-called "serial proliferators" – a small number of Chinese firms, both state and privately owned, and individuals who continue to engage in illicit WMD-related trade despite the repeated imposition of US sanctions.[103]

State-owned firms, such as CPMIEC, and private entities, such as Li Fangwei and his various companies, present cases where sanctions may not have been effective at deterring continued involvement; however, this is not to say that sanctions have not worked in other regards. For example, sanctions can prevent firms from conducting financial transactions, or can disrupt and increase the costs of their activities. Li's activities present a case in point: sanctions have caused him to open new companies, and let old ones lapse, in clear patterns of evasion.[104]

Non-proliferation sanctions have clearly affected the decision-making calculus of some SOEs, driving them to set up ICPs.[105] Despite some differences between US administrations, their continual use by each US government since the Clinton era shows that ICPs are perceived to be effective. For example, in 2005 US State Department official, Stephen Rademaker, stated that the US policy of "simultaneously engaging China in dialogue and pursuing the aggressive imposition of sanctions where required may be bearing some fruit."[106] He credited the pressure of sanctions with an interdiction by Chinese authorities of chemicals on their way to North Korea, and the disclosures of the prosecution of two companies in May 2004.

These effects need to be considered in the context of collateral damage to Sino-US relations. The imposition of sanctions is often met with indignation.

101 Salisbury 2013, 548.
102 Comment made by industry attendee at "Non-proliferation and export compliance outreach workshop," Tianjin, 13–14 February 2014; confidential correspondence, Chinese SOE compliance official, March 2015.
103 See, e.g., Desutter 2003.
104 Salisbury and Stewart 2014.
105 Confidential correspondence, Chinese SOE compliance official, March 2015.
106 Rademaker, Stephen G. 2005. "Remarks to US–China Economic and Security Review Commission," 10 March, http://2001-2009.state.gov/t/ac/rls/rm/43277.htm. Accessed 25 August 2015.

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The sanctions imposed in 1997 were described by a Chinese Ministry of Foreign Affairs (MFA) spokesperson as being "totally groundless,"[107] and as being "absolutely drawn from the air" by one of the affected companies.[108] In 2006, the MFA responded to sanctions by declaring that dialogue with the US was "useless," and that the sanctioning represented a violation of trust.[109] In 2008, sanctions were described as "incrementally destroy[ing]" cooperation between the US and China on non-proliferation, and in 2009 as "unilateral" and counter to non-proliferation norms.[110] Part of the issue, it seems, is that the information provided by the US to China is said to be limited and not of a "legal" standard.[111] Beijing's response to sanctions imposed on Li Fangwei's front companies in April 2014 capture the key dilemma in this regard: an MFA spokesperson declared that the sanctions "will harm bilateral cooperation on counter proliferation."[112] Similarly, it is often the case that the actions of Chinese companies may not have breached Chinese law, making it difficult for Chinese authorities to take action.[113]

Conclusion

China's role in stemming the illicit trade supplying the nuclear programmes of Iran and North Korea has been pivotal and will increase in importance as China's manufacturing base grows. This survey has considered the changing role of Chinese entities in WMD proliferation. In so doing, it has attempted to provide insights into the changing role of Chinese industry, and the response of Chinese actors to China's changing non-proliferation stance.

This analysis, supported by insights gained from fieldwork and discussions in China and the UK, suggests that Chinese SOEs are playing a decreasing role in proliferation and that concern in this regard is likewise lessening. This is evidenced by the increasing interest in and resource allocation to ICPs, reflecting the Chinese government's shift in position, a desire to demonstrate compliance and conduct business with international partners, and increasing social awareness.

The paper has argued that these changes, and other aspects of the changing situation on the ground in China, reflect insights from the broader Chinese risk management literature and the opportunities and challenges facing

107 "China demands US cancels sanctions over chemical weapons," *Associated Press*, 23 May 1997.
108 "US applies sanctions for chemical sales," *Arms Control Today*, May 1997, http://www.armscontrol.org/print/2731. Accessed 30 March 2015.
109 US Embassy 2008.
110 US Embassy Beijing. 2008. "China protests pending sanctions against three," 22 October, Cable No.08BEIJING4019, http://wikileaks.org/cable/2008/10/08BEIJING4019.html. Accessed 25 August 2015; US Embassy Beijing. 2009. "China protests sanctions against Dalian Sunny Industries/LIMMT and Bellamax," 23 January, Cable No.09BEIJING154, http://wikileaks.org/cable/2009/01/09BEIJING207.html. Accessed 25 August 2015.
111 US Embassy Beijing 2008.
112 Blanchard 2014.
113 Interview with Chinese expert, London, 15 March 2015.

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governments and industry in other countries when using export controls to prevent proliferation. Industry outreach on non-proliferation and export compliance is a challenge for all governments, although undoubtedly the scale of this challenge is greater in China. That larger organizations – such as Chinese SOEs and large Western conglomerates – have more to lose and are able to put more resources into ICPs is not specific to China.

While improvement in the state-owned sector's role in non-proliferation is welcomed, the challenge posed by the strategic manufacturing capability of China's growing private sector needs serious consideration. This will be the most significant challenge going forwards. Efforts need to be made to ensure that export control compliance is taken seriously, and that appropriate resources are available to Chinese companies in the form of best-practice guidance and training materials.[114]

摘要: 本文研究了中国实体在敏感材料与敏感技术扩散方面的行为特性。许多文献已经对源于中国企业的武器扩散问题进行了探讨, 也对中国政府与国际各方所采取的防扩散行动做出了评估。但是, 很少有学者能以系统性的、持续的方式来观察中国企业、区分它们的类型、并理解其武器扩散行为模式的演变。本文的观点是: 中国国有企业在全球武器扩散问题中的作用是在不断减小的, 本文也试图解释这个现象。我们分析了关于这个趋势的各种理论, 也阐述了中国在武器防扩散方面将带来的相应挑战。

关键词: 扩散; 核; 导弹; 商业; 合规; 出口管制; 制裁

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114 Industry attendee at "Non-proliferation and export compliance outreach workshop," Tianjin, 13–14 February 2014; confidential correspondence, Chinese SOE compliance official, March 2015.

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