

U.S.-China Engagement: In the Midst of Technology Transfers

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Abstract

The Paper analysis the impact of U.S-China Engagement that opened the doors for China to gain access to modern technologies, through transfers and U.S.-China cooperation in the field of science and technology, enabling China to make a major leap forward advancement in the field of high technology manufacturing. Today, China has emerged as one of the major exporter of high technologies providing for a cheaper alternative to other Western manufactured items. The paper briefly looks into the continuity in the U.S.-China engagement in the post-Cold War period as a result of various emerging compulsions. The question that arises is whether this engagement that helped China leap forward in the field of high technologies, also helped in the advancement of its military build-up through it illicit transfers. This could well pose a serious threat to American primacy as it could become a serious challenger to the United States both militarily as well as economically in the long run.

KEYWORDS: Engagement, Dual-use high technology, Illicit Technology Transfers, China's Military Capabilities.

Introduction

The post- Cold War era witnessed the rise of China, along with questions and concerns being raised on the threat it may pose to U.S. global primacy. Since the end of the Cold War global conditions favoured an expansion of global trade and commerce with economic engagement emerging as the path to a sustained progression towards global peace and security. The theme of economic engagement was well in place and China wanted to be a part of this new global engagement. The post-Cold War era during the Clinton administration witnessed an economic boom taking place in the United States with high growth and mass domestic consumption. This economic boom in the U.S. created positive market sentiments globally and encouraged the markets in the East to take advantage of the growth in the West, with China leading the front in order to take the maximum advantage.

According to Professor David Lampton, the emergence and the integration of China into the various global organizations should be seen and utilized by the United States in order to achieve productive consequences. He argued that given China's unique character not only restricting to its cultural and historical differences, Lampton extended China's uniqueness to the fact that there exist mass poverty amidst China becoming one of the top global trade power. This uniqueness is also extended to the fact that 800 million of China's population are peasants but it also has a rapidly growing, globally competitive urban population of 300 million, which is equal to the combined total population of Japan, North and South Korea, the Philippines, Malaysia and Singapore. In terms of technology, China despite being deficient and way behind the West in terms of modern technologies it has the capability of producing key

technologies particularly in the defense area. Therefore, given China's unique character and its emergence in the global arena, Lampton argued that it is essential that China gives an account to the world on its credibility as well as its intentions. On the American part it is necessary that engagement with China is seen as a constructive step in ensuring that it is beneficial as it would make China a more globally responsible player (Lampton, 1997: 136-137).

Decades of U.S. engagement with China has encouraged China to integrate itself further into the global community and this has achieved certain amount of success in ensuring that China acted more responsibly in the realms of international trade, non-proliferation and other issues that concerns not only the entire international community but the Chinese as well; since it impacts China's growth, and therefore, these common interest shared ensures that China joints hands with the rest of the world for a more developed and stable global environment. However, despite these positive outcomes it is still found that China continues to violate human rights at home, and remain unapologetically involved in breaking international non-proliferation norms; intellectual property rights and continues to weigh-in its muscle around its neighbouring countries such as Taiwan.

U.S.-China Relations Continuity amidst Change

Relations between the United States and China existed long before the American independence, since being a colony of the British, the Americans were in trade with China and had become accustomed to Chinese imports such as tea, silk, and other essentials. After the American Revolution and the attainment of its independence from Great Britain in the year 1776 the new United States Government remained eager to continue its trading relationship with China. The new nation's first ship to the Pacific, *The Empress of China* set sail for China on President Washington's fifty-second birthday, February 22, 1784. After a five months voyage on 23 August, 1784 it reached the Portuguese port of Macao, outpost of Canton, and in 28 August it became the first American ship to find its way to the Pacific by reaching Canton anchorage at Whampoa. Canton was chosen as the goal of this voyage because it was the world's great market for tea. The bulk of the cargo shipped by the Company in the *Empress of China*, included ginseng which was a highly prized herb in Asia, and that grew in abundance in the United States. It also carried fur skins, camlets, cotton, lead and pepper. On its homeward voyage on December 28, 1784, the *Empress of China*, carried with it teas, chinaware, silks, muslins and nankeens (Dulles 1930: 4-11).

By 1790, 28 American ships and by 1800 more than 100 reached Canton American export to China included ginseng, American grains, cheese, rum, sandalwood for making furniture's in China and incense and also huge quantities of cotton that were being produced in the south of America were also exported to China. By the 1840's the United States gained access to several ports by signing treaty with China that had weakened as a result of the defeat in the hands of the British in the Opium War. And by the late 19th century as a result of the crushing defeat in the Sino-Japanese War of 1894-1895, China became a hunting ground for imperial powers, such as Japan, Germany, Russia, France and Great Britain. This became a matter of concern for the Americans who had commercial interests in China, as a result after the Spanish-American-Cuban- Filipino War, U.S. Secretary of State; John Hay sent the imperial powers two notes. The first note send on September 6, 1899, was designed to protect American commercial interest in China by requesting the imperial powers to respect the principle of equal trade opportunity in their various Chinese spheres and

leaseholds. The second note sent on July 3, 1900 came amid the Boxer Rebellion and the threat that the imperial powers would partition China, therefore the U.S. government wanted to preserve the besieged nation's independence; these notes came to be called the "Open Door policy" (Paterson, 1989: 415-416).

U.S.-China relations since the Open Door policy has come a long way marked by engagement in the realms of commerce to decades of isolation and containment that started at the end of the Second World War with China going Communist. The Cold War period saw tensions between the two nations that led to a further drifting away in the relationship. However, as the intensity of the Cold War increased the U.S. administrations began to embrace the new geopolitics of the Cold War and looked at China as an offset to the Soviet power in the East. The huge political risk undertaken by the Nixon administration in the late 1960's marked the first major breakthrough in the U.S.-China relationship. This diplomatic initiative undertaken enabled the world to witness diplomatic exchanges such as the ping pong diplomacy and the Kissinger's secret trip to China that caused shock waves around the world. Improving relations with Beijing was an important component of Nixon's policy of détente since China offered a counterbalance in the U.S. relations with the Soviet Union. The Economic Reform initiated by China's Premier Deng Xiaoping in 1978, helped not only China's domestic economy but also its external relations. The reform was focused on four areas: agriculture, industry, science and technology and defense. China adopted a new open-door policy that placed emphasis on diplomatic relations with the West and the role of international trade, finance and foreign investments in China's economic development. This propelled the growth in China's domestic as well as international stature (Spero and Hart, 2003: 364-367).

The years of isolation between the U.S. and China further disintegrated as the Cold War came to an end with engagement emerging as the major theme in the policies shared by the two nations. The continuity of the relationship could be witnessed despite the Tiananmen Square incident that caused global outrage against the Chinese government and with domestic entities in the United States headed by the Congress leading the charge to ensure that China is punished for her inhumane actions. However, after a brief moment of sanctions being imposed on China the U.S. administration continued to court China to ensure that the decades of diplomatic initiatives undertaken does not become futile. The end of the Cold War saw China gain more international respectability by engaging in multilateral treaties in terms of global trade and non-proliferation of weapons. This decade witnessed the rise of China with its rapid economic growth enabling it to become an important actor in world politics. It has always been argued that the rise of China was a threat to global U.S. primacy; however it has been argued by Avery Goldstein that since the mid-1990s China shifted to a strategy that involved avoiding any direct challenges to the United States precisely because it recognised how weak it is relative to the U.S. and its allies both economically as well as militarily. The end of the Cold War saw a unipolar world led by the United States, and the Chinese leaders accepted this fact reorienting China's foreign policy towards a peaceful rise (Brooks and Wohlforth, 2008: 44-45).

Former Secretary of State, Warren Christopher in his memoir "Chances of a Lifetime", writes that the U.S.-China relations became a major issue during the Clinton presidential campaign with Clinton criticising President Bush for coddling China's Communist dictators and failing to use American leverage to improve China's human right abuses. However, after the elections, the White House almost

immediately began to draw back from candidate Clinton's sweeping campaign statements and began to intensify engagement with China by extending the annual preferential trading status, despite China's continued human right violation. Warren Christopher wrote about his meeting with Chinese Premier Li Peng on March 11, 1994, where he talked about the need for China to improve its human rights condition in order for the U.S. administration to extent the MFN status. Premier Li responded that China "...was fully prepared to lose favourable trade status.... Li went on to make it clear that China's human right policy was none of our business, noting that the United States had plenty of human rights problem of its own that needed attention....". Hence, relations despite difference continued to grow between the two nations and despite issues pertaining to Taiwan in early 1996 where the Chinese fired nuclear-capable M-9 missiles that flew over Taipei and the proliferation of nuclear weapons by China through the export of ring magnets to Pakistani organization responsible for producing the highly enriched uranium in Pakistan's nuclear weapons program (Christopher, 2001: 238-247).

The U.S. and China engagement from the end of the Cold War continued to grow in the aftermath of the 9/11 terrorist attacks, that heightened the relationship towards a comprehensive strategic alliance in the U.S. sponsored 'War on Terror'. The September 2002 National Security Strategy Report also called for better relationship with China but also clearly warned against any power seeking to challenge U.S. interests with military force. China continued with expansion of its military power along with economic and diplomatic relations in Asian and world affairs at a time of the U.S. preoccupation with the war in Iraq (Sutter, 2010: 152 and 154-155). China's entry into the WTO on December 11, 2001, after fifteen years of bilateral negotiation with the U.S. that also paved the way for the passage of the permanent normal trade relations or PNTR. China's entry into the WTO led to a rapid increase in its volume of overseas trade and its economy's real growth, as measured by the GDP, grew by 7.5 percent in 2001, 8 percent in 2002 and 9.1 percent in 2003 (Hook, 2005: 324).

China continued with its impressive economic growth despite the global financial crises in 2008, with Goldman Sachs in 2007 forecasting that China would overtake the U.S. as the world's largest economy by 2027. This period saw the emergence of the term 'geo-economics', that showed international relations moving towards strong linkages between economics and national security. The 2008 financial crises showed how closely the global economy is tied and how the U.S. economy has become dependent on global trade and investments, which meant that the health of the U.S. economy attributed to factors like the strength of the Chinese currency, the willingness of foreign investors to buy and hold American debt in the form of treasury bills and so on. According to Kurt M. Campbell and James B. Steinberg, the issues relating to economics which in the past was relegated to "low politics", in the course of time have started to affect the urgency and stakes of national security decisions (Campbell and Steinberg, 2008: 29-30).

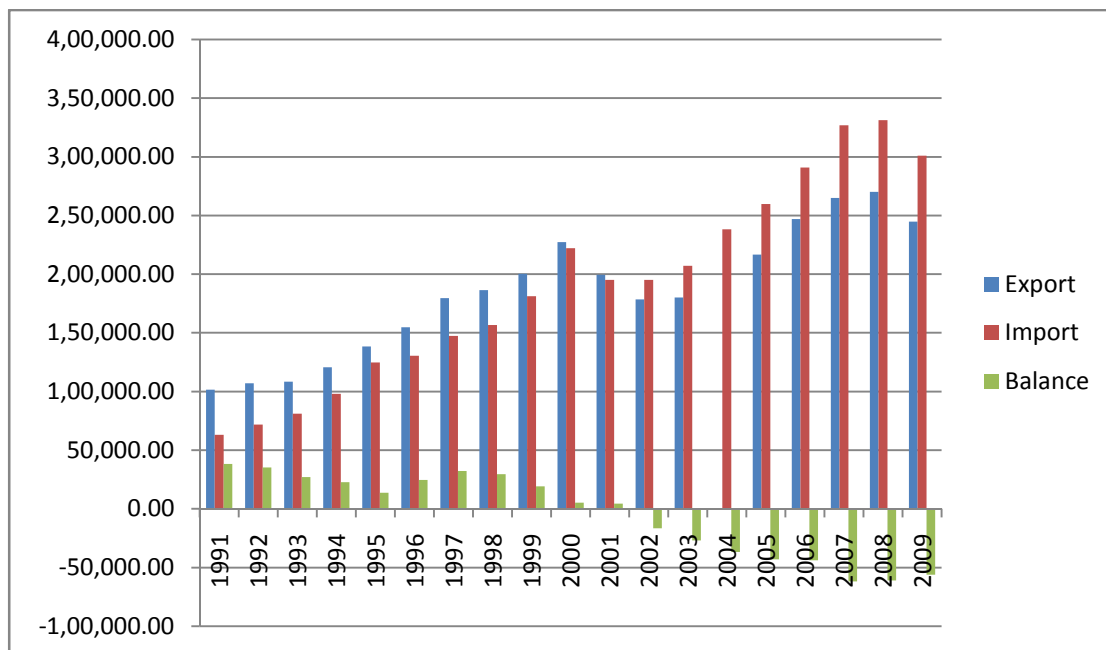
The post-2008 global economic crisis changed the relationship dramatically, the rapid unravelling of the U.S. financial markets, the revelation of previously undisclosed hazards, and the fragility of the U.S. economy to credit risks were deeply alarming to many Chinese that had staked their professional lives and reputations on aspirations to achieve American-style economic systems. This crisis effectively ended the American arguments against the Chinese model of economics and favoured for the adoption for a more western model. The Chinese also became increasingly convinced that they no

longer have much to learn from American counterparts on economic matters. At the same time within America views started emerging on looking at U.S-China trade relations with suspicion and China as a peer competitor in strategic, economic and normative terms (Freeman III, 2013: 185-186).

George W. Bush, like his predecessors, started his presidency on policy that favoured pro-Taiwan. However, the events after 9/11 and the realization of greater economic engagement post the global financial crises ensure that President Bush continued to have a good relations with China. The pattern of the incumbent U.S. President Barack Obama is also very similar to that of his predecessors, despite China’s growing geopolitical stature. On September 14, 2009, in the Group of Twenty Summit in Pittsburgh, President Obama spoke on the urgency of rebalancing world growth, especially between the United States and China. Obama asserted that the Americans can no longer keep buying from China on credit supplied by China. The long term fix was to get Americans to save more and China to spend more by starting to sell more to them (Reich, 2010: 69). Relations were strained in 2011 as a result of tensions in the South China Sea and the administration’s “Asia Pivot” in the political-military sphere. This relation was further stretched to a break during President Obama’s 2012 re-election campaign when the President kept a low profile on the criticism made by his presidential opponent Mitt Romney. However, President Obama was quick to ensure that the relations improve after his re-election by inviting President Xi to an unprecedented “G-2” individualized summit meeting in Palm Springs, California, in June 2013; ensuring continuity remains in the relationship between the two nations (Calder, 2014: 152).

Rise in China’s High Technology Capabilities through Engagement

Figure 1: U.S. Trade in Goods with Advance Technology Products 1991-2009 (in \$ million)



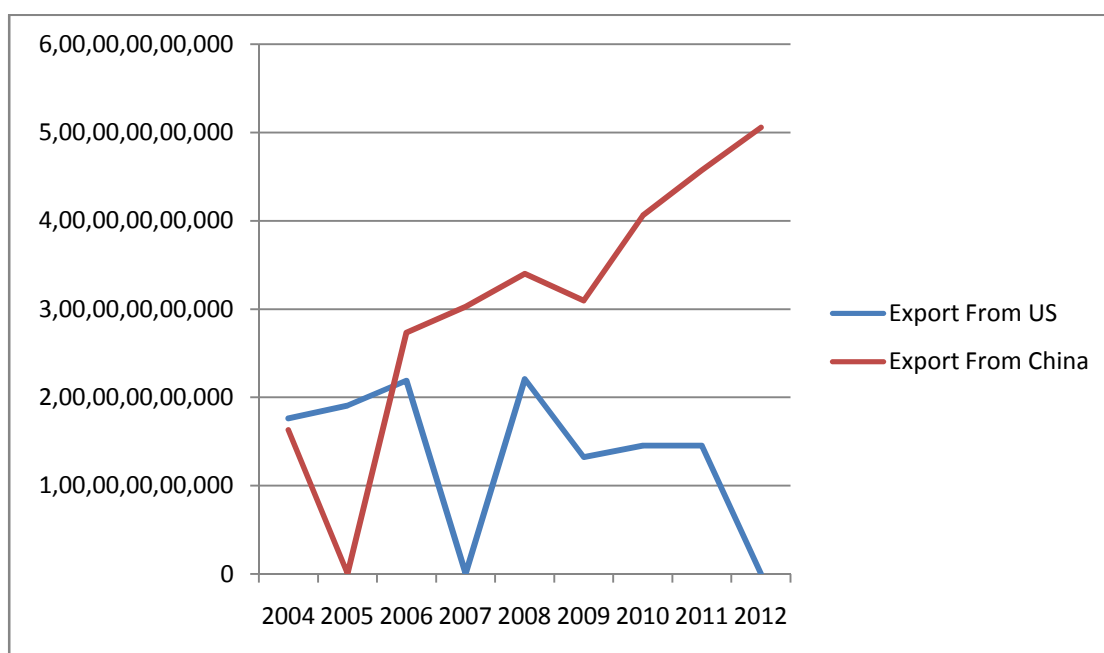
Source: United States Census Bureau, U.S. Department of Commerce

Figure 1 shows the U.S. trade in goods which includes advance technology products; it covers the post-Cold War period from 1991 to 2009. The bar-diagram shows how international trade in this field has increased with the advent of globalization with the United States starting with a favourable balance of trade and being a major exporter of high technology goods to facing a huge balance of trade deficit since 2002 with its deficit reaching about 56, 184 million at the end of 2009. The figure is an indication of U.S. companies either outsourcing its manufacturing to other nations or and more seriously shows an indication of other nations making progress in this field of high technology items either by making progress in their research and development or by the diffusion and transfers of imported technologies.

China is keen on developing a formidable capacity to adapt modern science and technology, in which it still lacks way behind the West. From 1960 to 1978 China had limited access to foreign markets and with little ability to borrow from abroad; China has to rely on its own efforts for most of its needs, including most machinery and equipments. Moa Zedong and Jiang Qing raised this approach to a matter of principle, making it difficult to import foreign technology of any kind. However, with the death of Moa and the arrest of Jiang Qing, this policy was decisively reversed in 1977 and 1978. The first step taken was to legitimize the importation of foreign technology and equipment; which also led to the question on how China would pay for these imports, resulting in the concert effort on the part of China to promote and increase exports. The net result of this was that China's export, mainly constituting of manufactured goods which rose from U.S. \$ 9.75 billion in 1978 to U.S. \$ 149 billion by 1995. This resulted in China having a surplus amount of foreign exchange at its disposal enabling it to import high-end technologies from the West (Perkins, 1997: 148-150).

After President Nixon's historic visit to China, the U.S.-China relations also emphasised on U.S.-China cooperation in the field of Science and Technology (S&T). On January 31, 1979, the United States and the PRC concluded an Agreement between the Government of the United States and the Government of the PRC on cooperation in S&T. This agreement provided for broad cooperation in scientific and technological fields of mutual interest and authorized specific implementing accords covering individual areas of cooperation. The Agreement also established a U.S.-PRC Joint Commission on Scientific and Technological Cooperation, to plan, coordinate and monitor cooperative projects under the Agreement.

The following figure compares the export of high technology from the U.S and China, based on the data from the World Bank. The figure shows the value of high technology export of the United States and China globally in terms of the U.S. dollar. The World Bank defines high technology products as items with high R&D intensity, such as aerospace, computers, pharmaceuticals, scientific instruments and electric machinery. From the data given in figure 2 below, it is quite clear that the U.S. has declined in terms of its exports of high-technology items; on the other hand we find that the value of high technology items exported by China globally has continued to be on the rise. The figure shows that after 2005, China has surpassed the United States in high technology exports. This indicates the progress made by China in term of high technology items. One major reason for this could be the global financial crisis, which could have also played a major role in curtailing U.S. export in this field, and China being seen as a cheaper alternative in the global markets.

Figure 2:U.S.-China High Technology Export 2004-2012 (Current US \$)

Source: World Bank Indicators

Today, the United States and China are engaged strategically, diplomatically, economically, socially, culturally, environmentally, regionally, educationally, and in many other domains; with both the nations emerging as the principal powers in the Asia-Pacific region and globally. This has not only led towards cooperation between the two nations but it is also causing a rise in competition, defined as “congame” by Zalmay Khalilzad which stood for a mixed picture of cooperation and competition. David Shambaugh defined it as “coopetition”, as he believed that this captured “...the contradictory dual nature- and the “new normal”- of the relationship today...”. According to Shambaugh mixed cooperation and competition is not an unusual condition for two countries, but it is an unusual condition for the two major powers in the world to find themselves in (Shambaugh, 2013: 3-4).

China’s enormous market has always been a great attraction for the Americans high technology industries as well as its European and Japanese competitors. Foreign investors have found China to be a tough nation to do business in. Foreign ownership rights are tightly controlled and non-Chinese businesses frequently are subjected to discrimination. Moreover, foreign exchange is carefully regulated making it difficult to buy and sell abroad, and foreign business often are required to transfer technological secrets to China as the price for operating in the Chinese market. China over the years has been very good in playing with foreign investors of different nations in order to get the best deals, technologies as well as know how; consequently nations were compelled to offer more than it wanted in order to outdo its nearest competitor and gain market access in China. This has enabled China through diverting commercial high technology items towards its military build up that might pose a major threat to the U.S. and the entire globe in the near future. The Chinese transferring of technological secrets towards its own domestic growth is a major area of concern in the U.S.-China relations bringing to light China’s violation of intellectual property rights. One of the most persistent problems confronting American firms in China has been that China has refused to protect the patents,

copyrights, trademarks and production secrets of foreign companies. American companies have time and again complained that the Chinese government has allowed Chinese producers to replicate American products and market them in China and other parts of Asia (Rothgeb 2001: 227).

According to Julia Chang Bloch a former American diplomat and the founder and current President of the U.S.-China Education Trust; a "...more serious problem for industrialized countries and the international system is China's appropriation of proprietary technology..." Bloch argues that since, China maintains tariffs that average 30 percent and may run as high as 100 percent for products such as automobiles, foreign companies are forced to build factories in China if they want to access the Chinese market. Therefore, ensuring the proprietorship for high technologies is disclosed to the Chinese in return for market access (Bloch, 1997: 199-200). A 2002 report by the General Accounting Office titled; "Export Controls: Rapid Advances in China's Semiconductor Industry Underscore Need for Fundamental U.S. Policy Review", stated that, "...since 1986, China has narrowed the gap between the U.S. and Chinese semiconductor manufacturing technology from between seven to 10 years to two years or less. China's success in acquiring manufacturing technology from abroad has improved its semiconductor manufacturing facilities for more capable weapons systems and advanced consumer electronics. The multilateral Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies has not affected China's ability to obtain semiconductor manufacturing equipment because the United States is the only member of this voluntary arrangement that considers China's acquisition of semiconductor manufacturing equipment a cause for concern..." (General Accounting Office 2002).

According to Robert B. Reich, a Professor at Berkeley and also a former Secretary of labor under the Clinton administration, stated that, "China's industrial and technology policy is unapologetically direct" which is eager in attaining American Know-how; and the best way to capture know-how is to get it firsthand. Reich argued that, China allowed many U.S. and foreign companies to sell their products in its domestic market with the condition that they should produce their products in China- often in joint ventures with Chinese companies. By 2009 American companies were helping China build all kinds of high technology items, such as new generation of photovoltaics that converts solar radiation into electricity. Massachusetts-based Evergreen Solar, a leader in the production of solar panels, moved its plan from Devens, Massachusetts, to Wuhan, China. Furthermore, Applied Materials, the world's largest supplier of equipment to make solar panels, moved both its chief technology officer and its newest research lab to Xian, China. American firms are also aiding China in the development of new application for nanotechnologies and also helping in building commercial jets and jet engines (Reich, 2010: 71-73).

The ways and means adopted in order to enhance its current state of technology either through diversion of civilian high technology towards military application or vice versa is a cause of concern. According to Charles Freeman III, China has sought to increase its technology base through technology transfer, attempting through incentives to encourage Western companies to incorporate higher technology platform into their production bases. However, according to the Freeman, China's effort in seeking the most advanced western technology has not been so successful. One could argue in favour of the extensive U.S. export laws for high technology being put in

place by the U.S. Department of Commerce. In practice however, the reason for China's lack of success in encouraging technology transfer is not U.S. policy but rather a rational U.S. company approach to risks associated with exposure of technology to the Chinese market, since intellectual property theft is so rampant that rational companies think long and hard before willingly exposing their first-line technology to the Chinese market place (Freeman III, 2013: 197).

Technology Transfers into China's Military Capabilities

One of the major concerns is the unprecedented rise in China's military and defense expenditure in the last decade. The Department of Defense continues to review on the debates surrounding the intension for the increasing expenditure towards China's defense, with conclusion showing that the actual Chinese military spending to be two to three times more than the figure given in the official Chinese documents. Former Secretary of Defense, Donald Rumsfeld during his visit to Singapore in June 2005 stated that, the huge military build-up by China is putting the delicate military balance in the region at a risk and also questioned China's intension for this massive military build up, since China does not face any external threat. However, Chinese official continued to dispute the claims made by Pentagon and argued that China spends less than 6 percent of what the United States spends on its defense (Katel, 2005: 312-313). China has been increasing its military budget albeit from a low base and roughly in line with the growth of its GDP, at a double digit annual pace since 1989. The estimated 2013 budget showed \$ 118 billion set aside for China's defense expenditure, which constituted about 1.38 percent of its GDP. According to Brown; aside from modernizing all military branches, China has built an aircraft carrier and stealth fighter, and it is expanding its submarine capability. China has improved its anti-ship missile capacity, it has advanced its anti-satellite program, including jamming devices, and it is investing heavily in cyber warfare (Brown, 2013: 168-170 and 178-179).

According to a 1997, RAND report; "the acquisition of advanced technology by the Chinese military and defense- industrial commerce that is helping towards China's military modernization is a matter of great concern"; there are significant and growing amount of evidence that this type of activity occurs via all manner of Chinese companies operating both in the U.S. domestic economy and abroad. Former Wall Street Journal reporter John Fialka, in his book, "War By Other Means"; claimed that 450 Chinese companies in America's West Coast are under Federal investigation for illegal technology transfer, although it is by no means clear that all these companies are dealing with the People's Liberation Army (PLA). According to the report, there is troubling evidence of attempts to acquire dual-use technology by Chinese companies in the United States. The Brighty Co. case further proves the suggested allegations against China; wherein Americans and PRC nationals, knowingly or otherwise, helped China buy defense-related equipment, usually at bargain prices, from public auctions or sale by the nation's largest defense contractors, such as Lockheed Martin Corporation, General Electric Company and General Dynamics Corporation. These purchases have been greatly facilitated by the end of the Cold War and the resulting shrinking of the defense industry, which placed billions of dollars of surplus equipment in the open market. In 1996, four Chinese officials from Chengdu, the site of numerous aircraft and defense-industrial facilities, purchased \$190,000 worth of machine tools from Northrop Grumman's Glen Arm facility, which once produced parts for B-1 bombers and F-14 Tomcats. Even though these purchases are

legal, exporting them to China under false pretences is a violation of U.S. Customs law. American companies in China are also involved in transferring dual-use technology to their Chinese partners, some of whom have military connections. The most well-known example involves McDonnell –Douglas’ joint venture with the China National Aero-Technology Import and Export Corporation. In late 1996, a GAO investigation concluded that sophisticated machine tools, sold to Chinese for use in the production of commercial aircraft parts, had been illegally transferred to AVIC’s Nanchang Aircraft Factory; which is a defense industrial factory which produces fighter aircraft and cruise missiles for the PLA as well as a variety of civilian products (Mulvenon 1997).

As a result of these illegalities, the U.S.-China Joint Defense Conversion Commission (JDCC) was formed with its first meeting being held on October 17, 1994, in Beijing. The goal of this Commission was to facilitate economic cooperation and technical exchanges and cooperation of both countries in the area of defense conversion, and to maintain regular contact via a government channel to resolve the problems which arise in the process of this cooperation. This commission was established, “to promote the orderly use, for peaceful purposes, of defense industrial, technological and scientific facilities and personnel not needed for defense requirements to satisfy the requirements of civil society” (U.S.-China Joint Defense Conversion Commission 1994). The Director of the International Relations and Trade Issue, U.S. General Accounting Office (GAO), Mr Benjamin F. Nelson; in a letter addressed to Floyd D. Spence, Chairman of the Committee on National Security, House of Representatives, wrote that; “China’s approach to defense conversion has been to integrate military and civilian production through a range of activities.... According to several specialists, China’s primary emphasis appears to be on diversification. A 1992 UN study on defense conversion concluded that China’s aim was to create dual-use (military and civilian) capacity- rather than straight conversion away from military production- with factories able to produce war material when needed....” (Nelson 1996).

Concerns on the rise of the military capabilities via illegitimate transfers by China also led to the insertion of Section 1305 into the National Defense Authorization Act that required the Secretary of Defense to prepare an annual report for the Congress on the future pattern of military modernization of the PRC. The 2008, Secretary of Defense Report to Congress, stated that, China’s defense-related industries will continue to gain through technology transfers from its joint ventures with foreign firms along with increased governmental spending on R&D. Furthermore, China’s illegal as well as legal acquisition of foreign military and dual-use technology is contributing towards its military modernization (Department of Defense 2008). The Secretary of Defense 2009, annual report to the Congress stated that; “development of innovative dual-use technology and an industrial base that serves both military and civilian needs is among the highest priorities of China’s leadership..... China’s defense industry has benefited from integration with China’s rapidly expanding civilian economy and science and technology sector, particularly elements that have access to foreign technology.... China’s commercial and military aviation industries have advanced from producing direct copies of early Soviet models to developing and producing indigenous aircraft and modern fourth generation fighters. China’s commercial aircraft industry has imported high-precision and technologically advanced machine tools, electronics, and other components that can be used in the production of military aircraft. However, China’s ability to surge production in the aircraft industry will be limited by its reliance on foreign sourcing for aircraft engines

and avionics, as well as the availability of skilled personnel and facilities” (Department of Defense 2009).

Conclusion

The paper has attempted a brief analysis into the indirect role of U.S.-China engagement in the advancement of China’s high technology manufacturing capabilities. The question that arises is that, whether there has been a movement on the question from the “want to engage” to “the need and the compulsion of engaging with China”. Despite the initiation of engagement that kicked off during the Nixon presidency given that period’s international scenario, realization set in amongst American policy makers that the need to engage with China has become essential for the United States both politically as well as economically given the new global order that came into existence post-Cold War and the vulnerability faced by the U.S. in the aftermath of the 9/11 terrorist attack. China’s role as a responsible global state has become ever more important to the United States. The question that emerges is up to which extend to engage with China given these new realities of its illegal activities in diverting imported high-end Commercial technologies from the U.S. towards its own end uses or users, that not only ensures its military build-up but may well pose a serious threat as an economic competitor to the American companies in the long run. Many believe that China’s military modernization may look good on paper but it lags way behind to that of the United States, for instance in terms of military hardware the U.S. military is probably two decades ahead of the PLA. Also China, being more engaged in protecting its territorial claims, its military strategy is focussed more in improving the defensive posture of its armed forces while developing a capability to fight short duration, high intensity war in the region. Therefore, the ability to achieve its military modernization will depend to a large extent on the rate at which it can assimilate the foreign technology it is acquiring either through joint ventures in civilian high technology sector or through the illicit route of transfers to various end uses or users.

Taking the example of China’s aerospace sector it can be seen that China which was once virtually dependent upon imports, today it is able to produce its own advanced military aircrafts. Chengdu J-10 is one of China’s most ambitious fighter programmes. When images of the J-10 were made available in the mid-1990’s it showed similar resemblance to Israel’s Lavi¹. By 2000 J-10 completed its trials programme and by August 2002 it achieved operational capability with the People’s Liberation Army Air Force or PLAAF. The J-10 was officially unveiled by the Chinese government on January 2007. It is a multirole combat aircraft capable of all-weather operation and according to U.S. experts the J-10 is at par with other fourth generation fighters such as the Dassault Rafale, BAe/ SAAB JAS 39 Gripen, Eurofighter Typhoon, Lockheed Martin F-16 and Boeign’s F/A-18E/F Super Hornet. The Chengdu Aircraft Co and the Shenyang Aircraft Co are also working on a new upgrade fighter with designation J-12, J13 and J-14. Images circulated on the internet show twin-engined stealthy aircraft bearing a striking resemblance to the Lockheed Martin F-22 Raptor. In the 2006 Air Show China, in Zhuhai, the Shenyang Aircraft Corporation unveiled the Unmanned Combat Aerial Vehicle (UCAV) known as the

¹ Israel in 1980-87 developed its own fourth generation fighters- the IAI Lavi (Young Lion) based on the F-16 technology. China and Israel cooperated in defence matters since the early 1980’s and Lavi clearly had an influence in shaping the outlook of the Chinese fighters (Gordon and Komissarov, 2009: 96)

Anjian; which was intended for counter-air combat missions². The Chengdu Aircraft Corporation also produced Xianglong (Soar Dragon) which is a long range high-altitude reconnaissance UAV; this UAV looked like a direct copy of the U.S. Air Force's RQ-4 Global Hawk. Like-wise China's aerospace industry through its joint ventures and illegal reverse engineering has also made advancement in other military aircrafts such as the H-6K bombers which can carry 6 Land Attack Cruise Missiles (LACMs) on its wings with either laser guidance or navigation satellite guidance. Experts believe that such an aircraft would be able to deliver strikes against Japan, India and Australia- all of whom are ill-equipped to defend against the PLA new LACMs. China's strike aircraft such as the JH-8 fighter-bomber by the Shenyang aircraft factory, produced for the People's Liberation Army Navy Air Force or PLANAF is able to carry four anti-shiping missiles while having at least three times the payload of the supersonic strike aircraft Q-5 (Gordon and Komissarov 2009: 105-110, 133-136, 157-160 and 305-307).

No doubt, that America is light years ahead of China in terms of high technology manufacturing and capabilities, and it could be decades before China could evenly match up against the United States. However, it would be unwise to dismiss these emerging trends, since China unlike other U.S. competitors is in itself a big market and thus interest lies within China to manufacture domestically in order to cater to the growing domestic demand. This sets all economic fundamentals in motion that could make China's emergence as a major manufacturer of high technologies that not only caters to its domestic needs but also provides a cheaper alternative to the Western manufacturers to the other nations, all this being achieved with its continued engagement with the United States.

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² This was a highly controversial project with no details provided; since aircraft designers attached high priority to unmanned bombers when developing the UCAVs, unmanned fighters has been regarded as something of a more distance future.

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