THE EMERGENCE OF THE ASIAN DEFENCE INDUSTRY: ARE CHINA AND JAPAN GOING TO FACE A WAR IN THE 'BUSINESS OF WAR'

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INTRODUCTION

East Asia is a region of contradictions. While it contributes an equal share to world Gross Domestic Product (GDP) as North America, it is also home to four flashpoints: the Taiwan Straits, Korean Peninsula, East China Sea and South China Sea. Countries in the region are bound to each other by economic linkages through trade and production networks, which have led the region to have a joint stake in its shared prosperity. However, increasing economic interdependence, while being a deterrent for conflict, falls short of becoming a cause for peace. Inability to resolve the historical legacies and boundary disputes, the competition for resources, the rise of China, the US pivot to Asia, the unstable regime of North Korea and the changing Japanese security identity are some of the multifarious security problems for the region. This constant clash of strategic aspirations to dominate the region ensures that military instruments will play a critical role in Asia.

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Increasing national assets brought forth with increasing economic activity, have led countries in the region to seek to protect their assets and resources by increasing their military capabilities. This has led to higher military expenditures which are spent largely on military modernisation.

The long standing conflict between Japan and China over islands in the East China Sea known as the Senkaku Islands in Japan and Diaoyu Islands in China, has been deteriorating since the 2010s. Massive anti-Japanese protests in China threaten to undermine the mutually-beneficial Sino-Japanese economic interdependencies that have built up with time. China's temporary embargo on rare earth minerals in 2010 that formed vital Japanese imports made it evident to Tokyo that Beijing would not hesitate to use economic sanctions to attain its political objectives. Further, large scale military escalation in the East China Sea has led to scrambling of fighter jets, locking of radars and an undue display of Chinese and Japanese naval warships which only precipitated the existing suspicions rather than calming the tensions. Historical legacies that were negotiated in the 1980s and early 1990s to pursue economic development are now viewed as irreconcilable factors in the bilateral relations. The East China Sea conflict has become an excuse for both countries to pursue military growth as China and Japan emphasise the other as a viable threat to their security. In this paper, we will aim to examine whether China, which is rapidly becoming a major arms exporter, and Japan, that seeks to relax the ban on arms exports and enter the global defence market, will face a war in this global industry of the 'business of war".

MILITARY MODERNISATION AND NEED FOR INDIGENOUS DEFENCE INDUSTRY

Military modernisation is defined as the relevant upgrade or improvement of existing military capabilities through the acquisition of new imported or indigenously developed weapon systems and

supporting assets, the incorporation of new doctrines, the creation of new organisational structures, and the institutionalisation of new manpower management and combat training programmes.[1] However, procurement of weapons and equipment occupies a central share in military modernisation and, consequently, the defence budgets of most countries. Defence acquisitions involve both domestic and foreign firms capable of meeting the necessary military requirements. While purchases from foreign companies are seen as a means of bringing in higher-end technology, they are also a drain on a country's hard-earned foreign exchange reserves. Large-scale foreign purchases also raise issues of safeguarding of national assets and security secrets. However, one of the most critical questions concerns security of supply. Without a ready source of domestic supply, countries have no reliable source of arms to defend themselves in a scenario of conflict and the most secure source is usually a domestic one. Consequently, achieving a certain degree of self-reliance in arms procurement becomes a key strategic goal. Adding to this aspiration for self-reliant defence is the fear that depending too heavily on imported weaponry risks exposing a country to arms embargoes, cut-offs and other types of supplier restraint, thus, weakening a nation's military capabilities and undermining its national security[2].

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Therefore, reducing one's reliance on foreign sources of arms is a crucial military objective as well as a means of securing the sovereignty and legitimacy of one's political institutions. Another strategic rationale driving defence industrialisation, especially among developing nations, is the more intangible aspiration of national pride and prestige. Possessing an

1. Ashley J. Tellis and Michael Wills, eds., *Strategic Asia 2005-06: Military Modernization in an Era of Uncertainty* (Canada: National Bureau of Asian Research, 2005), p. 15.
2. Richard A. Bitzinger, "Revisiting Armaments Production in **Southeast** Asia: New Dreams, Same Challenges", *Contemporary Southeast Asia: A Journal of International & Strategic Affairs,* vol. 35, issue 3, December 2013, pp. 369-394.

independent defence industrial capability feeds directly into many states' concepts of national power — not only by creating military power but also by demonstrating its industrial and technological prowess, and thereby confirming its status as a nation to be reckoned with. "Techno-nationalism" or the idea of acquiring technology forming the basis of nationalism has also become one of the means of achieving self-reliance in arms procurement. A robust indigenous defence industry such as in the case of Singapore is also seen as an important compensation by a smaller country to hedge its size and vulnerability with regard to its larger neighbours[3]. If strategic concerns are paramount to achieving self-reliance in defence procurement, economics is generally the other concern. Development in a country's defence industry can spur development in other industries, as the experience of the developed nations has shown.

Firstly, defence industrialisation promotes backward linkages spurring the development, expansion, and modernisation of other manufacturing sectors in the national economy such as steel, machine tools, and shipbuilding, as well as building up general skills and know-how of the human capital. All this industrial development, in turn, provides lead-in support, equipment and personnel for the production of armaments. The construction of warships, for example, can stimulate the establishment of indigenous shipbuilding industries, while production of military vehicles requires steel mills and automotive factories to provide critical parts and components such as armour plating, chassis, and engines, as well as skilled labour to assemble these vehicles. Domestic production of armaments at times also serves as a "technology locomotive," spurring the growth of new industries and new technologies, particularly in the higher-technology arenas such as aerospace, electronics and information technology sectors. Creation of these new strategic industries raises the country's level of technical expertise, manpower skills and industrial infrastructure. Military aerospace programmes, for example, often constitute the basis for civil aircraft production. Indigenous arms production also helps to create jobs

3. Ibid.

by generating much needed employment opportunities required by all countries.[4]

The recent rise in military expenditures in the East Asian region has permitted an increase in weapon acquisitions and, by extension, enabled the potential growth of local defence manufacturing. A major factor to note is the increasing emphasis on offset requirements in arms purchases as a means of gaining new technologies and human capital skills to support more advanced armaments production. Offsets are mutually beneficial arrangements whereby the supplier, as an incentive to the buyer, offers to transfer to it certain industrial or technological goods. From the early 1970s when 15 countries had offset requirements, presently around 120-130 countries demand offset clauses.[5] Offsets usually include the local licensed production of the weapon systems being acquired, training and other types of skills-building, technology transfers, sub-contracts, or Foreign Direct Investment (FDI) into the purchasing country's defence industry. In recent, years, the developing countries, to leapfrog and gain access to higher-rung technologies, have been increasingly demanding more (and larger) offsets in arms deals, and using those offsets to modernise and reinvigorate their defence sectors. The end aim for these countries, after satisfying the domestic need, is to enable the defence industry to become a major source of exports and, consequently, a strong earner of foreign exchange reserves.

WORLD DEFENCE MARKET OUTLOOK

There are five main factors that appear to be affecting the global defence industry today: the hierarchical nature of the global process of armaments production, the impact of military spending upon the defence industry, the effects of the international arms trade, the process of defence-industrial globalisation, and the emerging information technologies-based Revolution

4. Ibid.
5. Laxman Kumar Behera, "Arms Trade Offset: Global Trend and 'Best Practices", in Vinod Misra, ed., *Core Concerns in Indian Defence and the Imperatives for Reforms* (Pune: Pentagon Press, 2015), p. 289.

To deal with cyber threats, countries are now putting new command structures in place and promulgating policies on allowing the military Services to operate in cyber space.

in Military Affairs (RMA).[6] The growing international discourse on arms controls and export regulations along with restrictions on international collaboration on defence projects [barring major programmes such as the F-35 Joint Strike Fighter (JSF)] to keep technologies in-house, reduce access to both funds and technology for any path-breaking defence projects. Countries now emphasise newer approaches to security and aim for networked force structures that are both multi-usage and mobile. For example, counter-terrorism forces now look to police-based and intelligence-based approaches to remain a step ahead of the various terrorist groups. To deal with cyber threats, countries are now putting new command structures in place and promulgating policies on allowing the military Services to operate in cyber space. The rise of 'non-state' actors has created a flourishing black market for arms and other weapons.

In *Defence Outlook 2015: A Global Survey of Defence-Industry Executives* (published by McKinsey & Company), there is a general consensus that the global defence industry will see a decline of about 5-20 percent. On the question of new players emerging, industry executives from the West have stated that the expectation of a new competitive global player emerging is minimal. With regard to companies in emerging markets, the executives have stated that many of these defence firms would continue to function as low-cost manufacturers or suppliers. In the three-tier hierarchy of defence suppliers, as put forth by Keith Krauss—critical innovators; adaptors and modifiers and copiers and reproducers—mostly newly emerging firms are expected to remain at the third tier.[7] However, most Western executives agree that if any of these companies manage to emerge as global players, it

6. Richard A. Bitzinger, "Introduction: Challenges Facing the Global Arms Industry in the 21st Century", in Richard A. Bitzinger, ed., *The Modern Defense Industry: Political, Economic and Technological Challenges* (Santa Barbara: Praeger Security International, 2009), p. 1.
7. Ibid., p. 2.

would have significant ramifications for the global defence industry.[8]

From a macro-perspective, the top 50 nations spend 92 percent of global defence budgets, amounting to $1,636 billion of the world's total spending, on national defence.

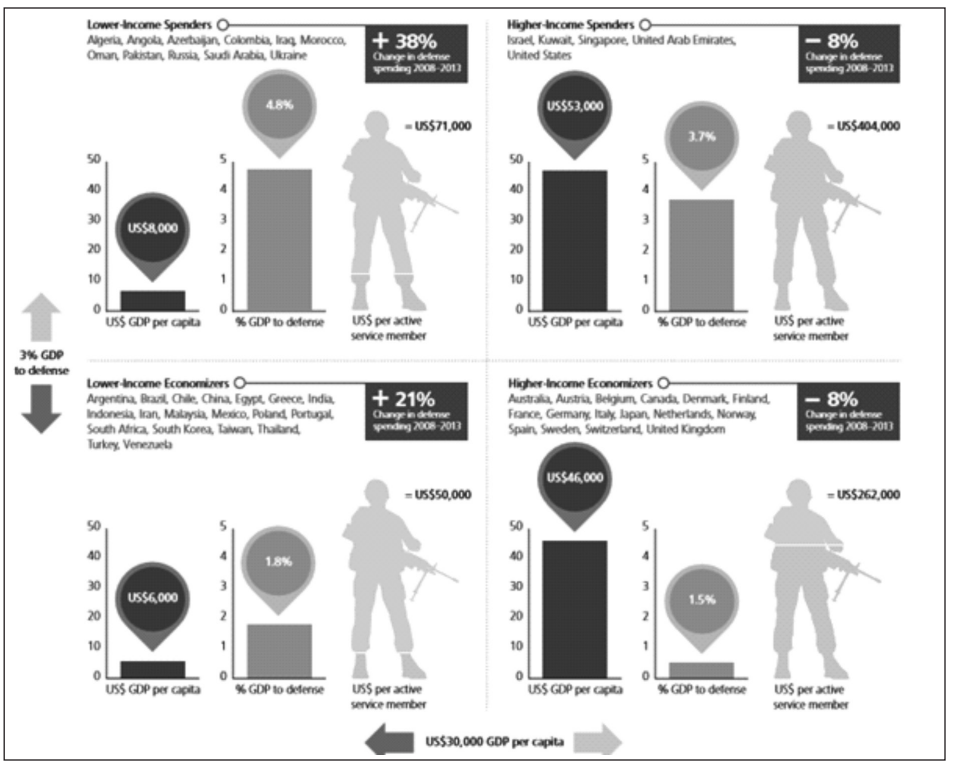
The McKinsey Report also states that the four sectors for most potential growth for defence companies are commercial aerospace, services, unmanned systems and cyber security. Further, of the 10 most lucrative defence markets, the **BRIC** (Brazil, Russia, India, China) countries rule the roost, with **India** at number one position, **Brazil** at number two, **Russia** at number six and **China** at number eight. All the four countries, despite being large economies, face hostile security environments. India especially faces the threat of a two-front war scenario owing to the "all-weather friendship" between China and Pakistan. Other important countries listed are South Korea at number five and Pakistan at number nine. While Japan does not make it to the top 10, it comes in strong at number 13. From a macro-perspective, the top 50 nations spend 92 percent of global defence budgets, amounting to $1,636 billion of the world's total spending, on national defence. The top 50 produce more than 90 percent of global economic output, influence most of the world's defence activity, and shape the global security environment. Six of these nations generate 60 percent of global defence spending (the US, China, Russia, Saudi Arabia, Japan and France); 29 of the top 50 nations increased defence spending in real terms, while 21 of the top 50 reduced their defence outlays.[9]

Deloitte, to examine the top 50 countries from a macroeconomic perspective, segments countries by their respective levels of per capita and percentage of GDP allocated to defence. Each country is characterised as higher income or lower income based on whether its GDP per capita is above or below US $ 30,000. Each country is then further classified as "spender" or "economiser" based on whether its level of defence spending exceeds 3 percent. Of the four BRIC countries, barring Russia, which is a

8. http://www.mckinsey.com/insights/manufacturing/defense_outlook_2015.
9. Ibid.

low-income spender, the other three are low income economisers. So while changing levels of economic growth allow lower income nations to increase defence investment, higher level income countries retrench.

Fig 1



Source: Deloitte 2014 Global Defence Outlook

Of the 25 top 50 nations with the highest per capita income, all but four (Australia, Singapore, Kuwait and Japan) have signalled that defence spending will decline or remain flat over the next two to five years. But the 25 lowest income members of the top 50 are all increasing defence spending in the same period. Further, between 2006 and 2012, the number of global terrorist incidents per year tripled but declined substantially in the high income countries. And with the impending end of Operation Enduring Freedom (OEF) and subsequent withdrawal of forces, it is expected that

the defence expenditure of the Western countries—that form a major block of the higher income countries—would fall further. Also, cyber threats prompt a different approach to security, for, while the main targets of cyber attacks in low income countries are government targets, in the high income countries, they are industrial targets However, with the instability in Ukraine, defence acquisitions in the North Atlantic Treaty Organisation (NATO) countries have received an impetus. By 2015, China's defence budget is expected to exceed the total of France, Germany and the UK, and total defence spending of Russia and China is expected to exceed all of the European Union countries combined[10].

CHINESE DEFENCE INDUSTRY

Influencing Factors

With its increasing international political and economic profile, China has laid great emphasis on improving its military capabilities to secure its national interests. China has two main options to ensure its military modernisation: domestically produce all of the weapons needed to equip the country's military or purchase weapon systems and related components and technologies from the major military equipment producers of the world. However, China has combined these two approaches by attempting to improve design and manufacturing processes so as to produce better-quality weapons domestically while importing key systems to fill short-term needs. After largely pursuing the first path for much of the 1960s, 1970s, and part of the 1980s, China has, since the 1990s, been following the combined path— improving domestic production while purchasing advanced weapon systems from abroad, mostly from Russia and Israel. However, the large volume of Russian imports during the 1990s indicates that China's military was decidedly dissatisfied with the quality of products from its own defence industry. Therefore, developing a strong domestic base has become imperative since the late 1990s to develop real

10. https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Public-Sector/gx-ps-global-defense-outlook-2014.pdf

military options, especially in view of the changing balance of power in Asia[11].

China's military modernisation programme is shaped by two main drivers: *contextual* and *direct*. Contextual drivers include a range of external factors in China's national security that shape China's threat perceptions, strategic outlook, and contingency planning. Direct drivers include a range of financial, political, and technological factors more internal to China. Preventing Taiwan's independence (and concomitantly bringing about its "reunification" with the mainland) is one of China's main priorities and a strong contextual driver for the People's Liberation Army's (PLA's) defence procurements, deployments and training. The second contextual driver is China's desire to become a global power. But with the exception of possessing Inter-Continental Ballistic Missiles (ICBMs), China has no global military capabilities. A third contextual driver of PLA modernisation is the regional security environment that China faces. The strong US presence in almost all China's regional systems has had a major impact on China's security calculus. Another factor that impinges on China's military modernisation programme is its increased demand for energy for which it is the Chinese military that has to shoulder the responsibility to ensure a regular supply of energy imports into China. Further, potential instabilities around China's periphery strongly influence the PLA's thinking and, subsequently, the military's modernisation programme.[12]

While contingencies, particularly regarding Taiwan and the United States, do drive budgets, deployments, and allocation of resources, they are more in the realm of what the PLA requires rather than what it gets. What the PLA gets is influenced by more direct drivers such as sanctioned funds, technology available, political climate and military doctrine. In all modern militaries, training regimens, financial allocations, weapons procurement decisions and a broad range of other considerations are determined by the operational doctrine. In the case of the PLA, the contemporary doctrine is designed to prepare the military force to

11. "A New Direction for China's Defense Industry", RAND Corporation, 2005.
12. Tellis and Wills, eds., n.1, p.84.

fight and win what China terms a "limited war under high technology and information conditions." Since its inception, the PLA doctrine has evolved through five principal stages: People's War (1935-79), People's War under Modern Conditions (1979-85), Limited War (1985-91), Limited War under High Technology Conditions (1991-2004), and Limited War under High-Technology and Information Conditions (2005-). Since the mid-2000s, China has speeded up "informationalization" of its military forces and has thereby accelerated the modernisation of weaponry and equipment.[13]

China's defence industry faced tumultuous times from the late 1970s till the recent times when Deng Xiaoping initiated reform of China's planned economy. Government procurement of military goods declined dramatically following the adoption of Deng's "Four Modernizations" policy—agriculture, industry, science and technology and national defence—which placed the military as the last priority. This led to most defence enterprises diversifying into production of non-military/civilian goods (defence conversion or *junzhuanmin*) which was a largely troubled process for most Chinese firms. Weapon producers found it difficult to shift to producing goods that could be profitably sold on emerging domestic markets. Military goods producers were also hampered by legal constraints and difficulties in attracting foreign partners who could provide new capital, know-how, and technologies. Firms also lacked the managerial flexibility to replicate the successes of the new Chinese companies that emerged during the reform period. These problems were further exacerbated by the general weaknesses of China's state-owned enterprises in absorbing new technologies and management practices, and in developing the technical skills of the labour force.[14]

The Chinese government's commitment to self-reliance in military equipment production also hindered the ability of these enterprises to successfully sell to non-defence markets, because factories had to remain capable of producing a full range of components and equipment for military

13. Ibid.
14. n. 11.

production, forestalling specialisation, and quality and technological sophistication. Chinese arms sales peaked in 1987 at over $1 billion. Chinese exporters, however, lost large export markets after the very poor performance of Chinese weapons in Iraq's hands during the 1991 Gulf War. This was followed by a period of heavy influx of technologically superior and relatively inexpensive Russian weapons. In the early 1990s, Chinese officials began inviting foreign investment in the defence-industrial sector. In 2001, the Chinese government adopted the "going out" strategy that encouraged offshore investment by Chinese firms. The Chinese efforts to extensively engage with offshore high-technology industry demonstrated the importance attached to high-technology industry. However, globalisation was still a one-way process, as evident from the 2007 "shareholding reforms" announced by the Commission of Science, Technology and Industry for National Defence (COSTIND) that permitted direct investment only under certain conditions.

While the Chinese authorities were prepared to accept foreign assistance in the form of technological inputs, they were extremely wary of arrangements that had the potential to place China in a dependent relationship. China completely eschewed long-term defence-industrial relationships after the Sino-Soviet split, in favour of reverse engineering and other forms of illicit technology transfer such as espionage of foreign designs. China began with producing Soviet systems under licence; it later shifted to reverse engineering before producing derivatives of foreign designs and ultimately advanced indigenous designs such as the J-10. However, the need for defence-industrial autonomy discouraged ambitious Research and Development (R&D) and production programmes, and led China to set a technological bar lower than in the Soviet Union. The subordination of economic to strategic considerations was further demonstrated by the extent to which China was prepared to go to preserve its defence-industrial capabilities in the event of a conflict. The "Third Front" initiative which was pursued from the late 1960s through to the late 1970s, saw the geographical dispersal of defence-related production

and R&D facilities to remote areas of central China at great cost, for reducing their vulnerability to attack.[15]

Structure and Sales

China's numerous military industries are all owned primarily by 10 large state owned companies. These top 10 defence groups, with estimated combined assets of Yuan 2 trillion ($315 billion) have listed more than 70 subsidiaries, including over 40 with defence related businesses. These companies cover all segments and conduct most of the defence research and development. These companies are listed below.[16]

- China Aviation Industry Corporation (AVIC)—makes aircraft for civilian and military uses, including bombers and fighter jets.
- China Aerospace Science and Technology Corp (CASTC)—the major contractor for China's space programme.
- China Aerospace Science and Industry Corporation (CASIC)—mainly engaged in the research and development of missiles.
- China North Industries Group Corp (NORINCO)—focusses on research and development of weapons and equipment for the land forces.
- China South Industries Group Corp (CSIGC)—makes weapons and equipment for the land forces, as well as civilian products ranging from motorcycles to special steel.
- China Electronics Technology Group Corp (CETGC)—specialises in research, development and production of large-scale electronic systems and software.
- China Shipbuilding Industry Corporation (CSIC)—manufactures civilian and military ships and offshore equipment, including submarines and missile destroyers in the northern China shipyards.
- China State Shipbuilding Corporation (CSSC)—manufactures civilian and military ships and offshore equipment, including submarines and

15. J.D. Kenneth Boutin, "Arms and Autonomy: The Limits of China's Defense Industrial Transformation" in Bitzinger, ed., n. 6.
16. http://www.sify.com/finance/china-s-top-10-defence-companies-imagegallery-1-others-mjrsA7fjahfsi.html

China's military spending more than quadrupled in real terms between 2000 and 2012, and the country has engaged in major efforts to develop its domestic arms industry.

missile destroyers in the eastern and southern China shipyards.

- China National Nuclear Corporation (CNNC)—China's major nuclear power investor and producer; also involved in research of nuclear weapon technology.
- China Nuclear Engineering Group Corp (CNEGC)—China's main construction contractor for its civilian and military nuclear projects.

Chinese companies are not covered by the Stockholm International Peace Research Institute (SIPRI) top 100 due to lack of data on which to make a reasonable estimate of arms sales for most companies. However, according to the information provided by their financial reports, the 10 large Chinese companies had total sales of around Yuan 1,477 billion ($233 billion) in 2011. These companies, each comprising hundreds of individual enterprises, produce a wide range of products, of which military products represent a minority of total sales. The military share is not generally known on a company-by-company level, although for the whole industry, it was estimated as 26 percent in 2006 and 25 percent in 2007. Based on the overall industry picture and on limited information on individual companies, it is nonetheless possible to state that at least 9 of these 10 companies would almost certainly be in the SIPRI top 100 if figures for arms sales were available. Of these, 4-6 would probably be in the top 20, and one company, the aviation company AVIC, may rank in the top 10.

China's military spending more than quadrupled in real terms between 2000 and 2012, and the country has engaged in major efforts to develop its domestic arms industry. As a result, China has, since the late 2000s, been decreasing its arms imports in favour of procurement from the Chinese industry. In addition, China's arms exports have grown substantially in the past decade, to the extent that the country was the fourth largest arms

exporter in 2009-13.[17] The top level decision-making body for the Chinese military industry comprises the State Council and Central Military Commission (CMC). The State Council is the highest "executive organ" of state administration. The CMC exercises direct unified command of the PLA. All decisions to launch major projects as well as directives on rules and regulations for the defence industry are issued jointly by the State Council and CMC. Any large arms export contract also requires the approval of both the State Council and the CMC. The State Council is also responsible for organisations involved in the economic and technical aspects of China's military industry policies.

While substantial growth has been made by China's defence companies with the reorganisation and streamlining launched in the 1990s, inherent deficiencies remain.

These organisations include the state owned Assets Supervision and Administration Commission (SASAC) and the State Administration for Science and Technology and Industry for National Defence (SASTIND). The CMC controls the PLA's General Armaments Department (GAD) which projects the requirements for new weapons, specifies operational requirements, and tests the armaments produced. In 2007, Beijing issued guidelines aimed at encouraging private investment in a sector traditionally sheltered from competition and public scrutiny. Beijing has made repeated calls to speed up listings of all but the most sensitive military businesses. About 25 per cent of the assets of the top 10 are now held in the listed companies, according to market analysts.[18] While substantial growth has been made by China's defence companies with the reorganisation and streamlining launched in the 1990s, inherent deficiencies remain. Also, one has to take into consideration the fact that China has yet to make great forays in the global defence market as more than 50 percent of the sales of jet fighters, warships and tanks go to its ally, Pakistan.

17. *SIPRI Yearbook 2014: Armaments, Disarmament and International Security.*
18. http://www.reuters.com/article/2012/09/16/us-china-defence-idUSBRE88F0GM20120916

JAPANESE DEFENCE INDUSTRY

Influencing Factors

In its *Diplomatic Bluebook 2014*, Japan describes its surrounding security environment as becoming "increasingly severe" due to a significant change taking place in the balance of power among nations. With the relative decline of US influence in recent times, Japan has been in a dilemma on how to reinvigorate and support the US' extended deterrence in the region. In recent years, the range of activities of the Japanese Self-Defence Forces (SDF) has been constantly expanding. From participation in international peace-keeping activities, to their active role in disaster relief post-2011 Tohoku earthquake, the late 2000s saw an increasing public acceptance for the presence of the SDF. Shinzo Abe, the first post-war born prime minister in Japan, with his strong nationalist leanings, had been a major influencer in enlarging the mandate of the SDF. After his resounding victory in the 2012 and again in the 2014 elections, Abe has provided a thrust for bolstering the Japanese SDF with numerous legislations.

Due to constitutional restrictions, Japan cannot maintain offensive war material. Yet, it currently maintains the Japan Ground Self-Defence Force (JGSDF) that numbers approximately 160,000 troops with a large number of technically superior tanks, personnel carriers, mechanised artillery hardware, avionics and missiles most which are supplied by the United States. The Japan Maritime Self-Defence Force (JMSDF) numbers some 45,000 members and controls advanced submarines, warships, combat aircraft and armed helicopters, and a variety of smaller combat or support vessels. The Japan Air Self-Defence Force (JASDF) features a force of some 47,000 personnel.[19] They control approximately 12 fighter squadrons and utilise about 400 combat aircraft in addition to roughly 300 interceptors.[20] The Japanese defence industry has an important role to play in the entire lifecycle of the SDF defence equipment, from its manufacture to maintenance. Since

19. Brahmand World Defence Update 2015 (Pentagon Press).
20. Michael A. Panton, "Politics, Practice and Pacifism: Revising Article 9 of the Japanese Constitution," *Asian-Pacific Law & Policy Journal*, vol. 11, no. 2, p. 178.

Japan's defence budget is minimal compared to those of its neighbours, especially China, the austerity has forced the Japanese defence industry to become more efficient to survive, as military Services cannot bear the cost premium required to subsidise inefficient domestic production.

However, despite constitutional restrictions, Japan's inherent technological capabilities have always enhanced its deterrent capabilities and diplomatic negotiating power to inhibit aggressive action by other countries, ensuring national sovereignty without dependence on other countries. With a more capable indigenous defence technology base, Japan has the potential to reduce its reliance on imports of defence products as indigenously developed technologies can be tailored to Japan's specific needs. This has the added benefit of increasing economic activity at higher levels of the value chain, including design and R&D. Since defence technology can often be applied to the electronics, computing, or commercial aerospace industries, Japan's edge in robotics can be multiplied by leveraging technology and processes developed in the defence industry. Despite progress and optimism, there are limitations and obstacles that may hinder growth and reform in Japan's aerospace and defence industry. The nation has several economic priorities which may compete with the indigenous defence industry, such as social welfare and health care spending for the elderly population, priorities on other areas of growth stimulus as well as payments on outstanding debt.

In the years following World War II, Japan's military industries were totally shut down during a period of internationally rapid development, particularly in the case of the aircraft industry. Japan's defence industry was kept in quasi-isolation by its own government, with a ban on arms exports in keeping with the "Three Principles" formulated at the 1967 Diet session. The Three Principles prohibited exports to Communist bloc countries, countries subject to "arms" exports embargo under the United Nations Security Council's resolutions, and countries involved, or likely to be involved, in international conflicts. In February 1976, the Government of Japan announced the collateral policy guidelines at the Diet session that "arms" exports to other areas not included in the Three Principles would also

be restrained in conformity with Japan's position as a peace-loving nation.[21] However, despite the isolation, the domestic defence industry transformed into a dominant player in design and manufacture of defence components. Japan began as a supplier of defence components and later began to build and produce various indigenous aircraft ranging from the C-1 and PS-1 to the more recent P-1 and F-2. Though Japanese industry went on to make great progress, building components for the most advanced civilian aircraft such as Boeing 767s/777s/787s and co-producing advanced military aircraft such as the Lockheed P3Cs and F-15s, it has been handicapped by restrictions placed on exports of military technology or products.

On December 27, 2011, the Japanese government officially announced easing of the ban, allowing Japanese defence contractors to take part in the joint development of weapons with other countries (and not only the US) and to supply military equipment for humanitarian purposes. Although Japan is the world's sixth biggest military spender, it often pays more than double what other nations pay for the same equipment because local export restricted manufacturers can only fill small orders at a high cost. Given the fiscal restraints, Tokyo is, therefore, keen to make its defence programme more efficient to maintain its military capability in the face of China's rise and growing uncertainties in the region. A 2012 report entitled, "Towards Formulation of a Strategy for Survival" released by the Ministry of Defence' Defence Production and Technology Base Research Committee, after a six months study, noted that Japan is suffering from what is often labelled as the **Galapagos syndrome of isolation**[22] from global markets after half a century of ban on weapons exports.[23] However, inability to resolve its historical legacies has led Japan to constantly reiterate its pacifist stand by prohibiting manufacture and export of complete weapon systems.

21. "Japan's Policies on the Control of Arms Exports", Ministry of Foreign Affairs, at http://www.mofa.go.jp/policy/un/disarmament/policy/.
22. Galápagos syndrome is a term of Japanese origin, which refers to an isolated development branch of a globally available product. The term is a reference to similar phenomena Charles Darwin encountered in the Galápagos Islands, with its isolated flora and fauna, which were key observations in the development of the Evolutionary Theory.
23. "Japan Strives to Overcome Industrial Base Crisis", *Defense News*, June 24, 2012 at http://www.defensenews.com/article/20120624/DEFREG03/306240003/Japan-Strives-Overcome-DefenseIndustrial-Base-8216-Crisis-8217 .

The issue of urgency is that Japan, with its numerous legislative constraints, must ensure that the domestic defence industry remains dynamic as its collapse in the face of international competition may lead the country to lose much-needed autonomy in defence production or at least breakout capability for autonomy and, thus, strategic leverage on the US and any independence left in the destiny of its own security policy. On April 1, 2014, the Government of Japan, in accordance with the National Security Strategy adopted on December 17, 2013, set out the "Three Principles of Transfer of Defence Equipment and Technology" as a set of new principles on overseas transfer of defence equipment and technology, which replaced the "Three Principles on Arms Exports and Their Related Policy Guidelines". According to the new principles, an appropriate overseas transfer of defence equipment and technology contributes to "active promotion of the maintenance of international peace and security through timely and effective implementation of contribution to peace and international cooperation…. to strengthening security and defence cooperation with the United States as well as other countries[24]." The new principles lay out that the Japanese government will make a comprehensive judgment in the light of the existing guidelines of the international export control regime and, based on the information available, will analyse the extent to which the overseas transfer of such equipment and technology will raise concerns for Japan's security.

As acknowledged by Japan's aerospace trade association, "When compared with the automobile, home electric, computer and other industries in Japan, the aerospace industry is relatively small. Much is expected of Japanese producers over the coming years".[25] Like Europe, Japan faces a dilemma where aerospace is concerned. The status of possessing a key, high-technology industry – and one with military applications – pushes states to cultivate sector-specific policies in the hope that domestic firms can reap the rewards. Yet the cost and

24. "Three Principles on Transfer of Defence Equipment and Technology", http://www.mofa.go.jp/files/000034953.pdf .
25. Steven McGuire, "The United States, Japan and the Aerospace Industry: From Capture to Competitor?" *Pacific Review*, vol. 20, issue 3, September 2007, pp. 329-350.

complexity of modern aircraft push the industry in the direction of global production structures where components are bought from around the world with a network of partner firms. Europe and Japan have struggled to develop policies that advance national ambitions for aerospace without antagonising the key American market – and its government. Japan, unlike Europe, has chosen to cooperate closely, being a primary contractor/ supplier to both American and European firms.

Structure and Sales

The Japanese defence industry is primarily a consortium of privately-owned group of companies, with defence and aerospace occupying a significant portion of the business. Japan accounts for 17 percent of the Asia-Pacific aerospace and defence sector value. Mitsubishi Heavy Industries (MHI) is the leading player in the Japanese aerospace and defence sector, generating a 22.8 percent share of the sector's value. Some of the other defence companies in Japan are Fuji Heavy Industries (FHI), Kawasaki Heavy Industries (KHI), Sumitomo Heavy Industries (SHI), NEC, ShinMaywa, and IHI, with defence leading to as much as 20 percent of total revenue of the group's business. Boeing has counted on Japanese manufacturers to produce parts for its aircraft, with Japanese companies making 35 percent of the 787 Dreamliner and 21 percent of the 777's wide body jets. For the Boeing 777, MHI, KHI, FHI, ShinMaywa and Nippi Corp. will hold a 21 percent work share to include fuselage sections, passenger entry doors, landing gear wheel wells and cargo doors, and their total work share will comprise 21 percent of the 777's structures. MHI, FHI and ShinMaywa are also involved in Airbus' A380 programme. Japanese engine manufacturers such as IHI are partners in the programmes of GE's GE90 and Rolls-Royce's Trent, while KHI is involved in Rolls-Royce's Trent and Pratt & Whitney's (P&W's) PW400, and MHI is also involved in partnership with P&W concerning the PW 400.

To stay within constitutional restrictions, Japanese firms have promoted a new trend towards disaggregation of product or platform technologies into more discrete components that can be applied to both commercial and

defence-oriented purposes. Following the Japanese philosophy of "spin on" with increased levels of R&D spending by industry, even Western companies are now actively looking for opportunities to apply commercially developed technology to military systems, rather than the other way round. Emphasis has begun to be placed on systems integration: the ability to integrate many different technologies (of commercial and/or defence origin) into a new, more advanced defence system. Further, with increasing globalisation and massive advancement of the Information Technology (IT) sector, the giant, autonomous firms that once contained the entire vertical production chain are now being transformed into horizontally integrated and modular enterprises that focus on one or selected parts of the production chain. In this sense, the technology itself is dual-use, regardless of a user's intent.

The Japanese aerospace and defence industry has undergone a revival from virtual stagnation in 2010 to double digit growth in 2013. The market is predicted to stabilise and post strong growth towards 2018. The Japanese aerospace and defence market had total revenues of $45.3 billion in 2013, representing a Compound Annual Growth Rate (CAGR) of 4.9 percent between 2009 and 2013. In comparison, the Chinese and Indian markets grew with CAGRs of 9.2 percent and 9.8 percent respectively, over the same period, to reach the respective values of $127.7 billion and $24.3 billion in 2013. The defence segment was the market's most lucrative in 2013, with total revenues of $26.3 billion, equivalent to 58 percent of the market's overall value. The civil aerospace segment contributed revenues of $19 billion in 2013, equating to 42 percent of the market's aggregate value. The performance of the market is forecast to accelerate, with an anticipated CAGR of 7.7 percent for the five-year period 2013-18, which is expected to drive the market to a value of $65.5 billion by the end of 2018.[26]

COMPETITION, OR NOT?

Barack Obama's shifting the American military and diplomatic pivot to the Asia-Pacific puts the two regional neighbours, China and Japan, more sharply into the international spotlight. The fact that after World

26. Market Line Industry Profile, "Aerospace & Defense in Japan", April 2014.

War II, Japan was engaged in a security alliance with the United States diminished Beijing's fears that, at least in the short to intermediate term, Japan might reassert its World War II era disposition toward militarism. However, Beijing now views the same alliance (and efforts to upgrade it) as the US' and Japan's joint efforts to counter China's military power. Historical legacies that were negotiated in the 1980s and early 1990s to pursue economic development are now viewed as irreconcilable factors in the bilateral relations. The East China Sea conflict has become an excuse for both countries to pursue military growth as China and Japan emphasise the other as viable threats to their security. Though in the **guns versus butter** debate, **butter** (utilising available resources for the production of civilian goods) will retain a strong priority for both countries, as in East Asia, governments primarily derive legitimacy from economic growth rates. However, to enhance their military capabilities in view of their rising threat perceptions, both countries will devote a relatively larger share to **guns** (utilising available resources for the production of military goods) to develop a robust indigenous defence base.

If one looks at the case of the developed nations, they developed sophisticated weapons and other equipment from the capability of their indigenous defence base. Be it the US or erstwhile USSR/ present day Russian Federation, their existing military capabilities can be traced to the strength of their domestic defence companies. And it this strength that, consequently, deters enemies from any aggressive course of action. While export of strategic technologies is kept under restrictions by national governments, it is the irony of the defence industry that to sustain itself and be constantly innovating, it has to be export-oriented. While technology denied is technology gained, exports create the requisite orders (in addition to demand by the national military) that make production of expensive weapons financially viable. Exports also result in valuable feedback from the purchasing countries as to how to improve the existing weapon systems to better achieve their purpose. **It is, hence, a causal nexus that while defence companies play a very important contribution in the national security of a country, they are commercial ventures.**

And unless they are commercially viable, the national security of that country will always be fragile.

China has been an older player than Japan on the global defence market. Japan, on the other hand, despite being a very late entrant, has potential technological capabilities such as its edge in ICT (Information and Communications Technology) that can translate into competitive defence products. This does pose a very credible threat to China. Aerospace is considered the most profitable segment of the defence market and involves leading edge technologies. Both countries seek to become strong aerospace players. Maritime power is seen as the deciding factor in a country's transition to global power status; however, recently, aerospace power with its ability to affect immediate strategic results and lower casualty rates has begun to receive greater prominence in militaries around the world. While China still relies on Russian technologies for development of domestic aircraft, Japanese aircraft manufacturers are taking part in sub-assembly and/ or manufacture of components of various models of US and European aircraft mainframes, including Boeing and Airbus, as contractors.

In the present day, exchange of defence technologies forms a critical component of bilateral or multilateral strategic relations. Exporting defence technologies to another country is seen as a signalling and reiteration of the receiving country's strategic value to the exporting country. Further, exports of weapons and other defence equipment also lead to uniformity in procedures and systems between partner countries and alliance coalitions. However, the high prices of Japanese technologies and goods being manufactured by Japan, and the suspicions of its neighbours about its re-militarisation—as also its constitutional restrictions—prevent Japan from manufacturing offensive military hardware. Instead, Japanese defence companies now focus their export efforts on parts, including sensors and advanced building materials.[27] Exporting under the category of dual-use technologies allows Japan dual benefits of remaining within its

27. http://www.wsj.com/articles/japans-military-contractors-make-push-in-weapons-exports-1405879822

constitutional limitations and being a credible partner to its allies. China, on the other hand, has products in all ranges and categories on the global defence market. With its lower prices, China exports to 35 mainly low- and middle-income countries, with Pakistan accounting for more than 55 percent of its defence sales.

There is an inherent dichotomy in supply-demand relations in the defence industry. On the supply side, the companies want to manufacture systems with the highest possible performance that, in turn, leads to spiralling costs and interminable deadlines. On the demand side, countries that are the main buyers, want affordable systems and prefer to purchase from the lowest bidder. In this kind of challenging scenario, more than what the Chinese and Japanese defence companies will manufacture, it is how they place themselves and their products in the global defence market that will make the difference. On the whole, while the countries do not find themselves in direct competition, the dynamics of power rivalry, coupled with historical animosities, lend an edge of uncertainty to the question of whether China and Japan will face a war in the 'business of war.'