UNIPOLAR, BIPOLAR OR MULTIPOLAR INTERNATIONAL SYSTEM? THE DEFENSE INDUSTRY FACTOR

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ABSTRACT

International system can be defined as a complex system of systems that is comprised of economic, political, scientific, technological and military systems. It is hard to analyze this complex system. It is even harder to forecast its future.

Nonetheless, there are factors such as the defense industry and military power that affect the dynamics of the international system much more than other factors. After the Revolution in Military Affairs, which transformed the military paradigm, significance of these factors for international relations increased.

In this study, interdependence of international relations, military technology, military power and defense industry was investigated. It was found that the global defense industrial order is a good indicator of balance of power in the international system. Scenarios about the future of the international system were built by the help of scenarios about the future of the global defense industrial order.

Key Words: International Relations, Defense Industry, Balance of Power, Military Power

ÖZET

Tek Kutuplu, Iki Kutuplu Veya Çok Kutuplu Uluslararasi Sistem? Savunma Sanayi Faktörü

Uluslararası sistem, ekonomik, siyasi, bilimsel, teknolojik ve askeri sistemlerden oluşan karmaşık bir sistemler sistemi olarak tanımlanabilir. Bu karmaşık sistemi analiz etmek zordur. Geleceğini tahmin etmek daha da zordur.

Bununla beraber, savunma sanayi ve askeri güç gibi uluslararası sistem dinamiklerini diğer faktörlerden çok daha fazla etkileyen faktörler vardır. Askeri paradigmayı dönüştüren Askeri Alanda Devrim'den sonra, bu faktörlerin uluslararası ilişkiler için önemi artmıştır.

Bu çalışmada, uluslararası ilişkilerin, askeri teknolojinin, askeri gücün ve savunma sanayinin birbirleriyle olan bağlantıları araştırıldı. Küresel savunma sanayi düzeninin, uluslararası sistemdeki güç dengesinin iyi bir göstergesi olduğu tespit edildi. Uluslararası sistemin geleceğine ilişkin senaryolar, küresel savunma sanayi düzeninin geleceği hakkındaki senaryolar yardımıyla oluşturuldu.

Anahtar Kelimeler: Uluslararası İlişkiler, Savunma Sanayi, Güçler Dengesi, Askeri Güç

1. INTRODUCTION

Various economic, political, technological and military factors affect international relations dynamics. Globalization, the Revolution in Military Affairs (RMA) and technological developments increased the interaction of these factors and the complexity of international system. Analyzing this system and forecasting its future present many difficulties.

Nonetheless, the global defense industrial order affects the dynamics of the international system much more directly and significantly than other factors and can be used as an indicator of balance of power in the international system. Defense industry's effect on the international system dynamics stem at a great extent from the interdependence of political power, military power, defense industry and military technology.

Especially after the RMA, which transformed the nature of military affairs, importance of the defense industry for international relations increased. Global defense industry market is today at the crossroads of global economy and international politics. Technical progress, the emergence of new threats, economic and political factors determines its future market environment. (Hartley and Sandler, 2003: 361-380)

Aim of this paper is to determine these channels of interaction between the defense industry and international relations, to analyze the international relations dynamics in relation with the global defense industry market, and to forecast the future of the international relations with the help of the future of the global defense industry.

In the second part, interdependence of international relations, military technology, military power and defense industry will be investigated. In the third part, international politics and international system will be examined from a realist perspective. In the fourth part, global defense industrial order will be analyzed. In the fifth part, scenarios about the future of the global defense industrial system will be built. In the sixth part, scenarios about the future of the international system will be built by the help of scenarios about the future of the global defense industrial order.

2. INTERDEPENDENCE OF INTERNATIONAL POLITICS AND THE DEFENSE INDUSTRY

Defense industry is different from other industries. Its character and operations pose technological, economic, political and security problems. (Markusen, 1999) Defense industry's character is an outcome of interconnection of national power, military power, defense industry and military technology. Different schools of thoughts evaluate these notions from different perspectives. For the realist school of thought, these are core concepts.

According to Gilpin, great power domination depends on military technology and military power. Transfer of military technology and power can

trigger war and can change balance of power in world politics. (Gilpin, 1981: 182) Jervis points out to the importance of defensive and offensive military technology in affecting the incentives of war. (Jervis, 2002: 1-14) Walt argues that technological change, especially the military technology change can alter the international balance of power by affecting the comparative military and national power. (Waltz, 1979)

Theoretical arguments are supported by nations' efforts to advance their military technology. States try to protect their national security by increasing their relative national power by pursuing programs that will help them to develop the most advanced weapon systems.

Military power is a combination of various elements including the naval, army, air force and strategic assets and other elements, which are defined as force multipliers such as C4ISR capabilities, information, electronic and psychological warfare, digitization of the battlefield, networked systems, joint operations capability, logistics and military personnel quality. (Mulvenon and Yang, 2003: 1)

Nonetheless, to have some of these military assets and capabilities mentioned above does not necessarily mean that a nation is militarily powerful. Countries with advanced weapon systems may not be influential in world politics as much as it would be expected since they are dependent on other countries militarily. As can be seen from Table 1, countries that have advanced weapon systems such as Japan are highly dependent on other nations with regards to advanced weapon systems. Japan's ratio of arms imports as percent of arms exports is 15000.

The fact that the only nation that has an 'arms imports as percent of arms exports' ratio below ten is the U.S. and the fact that there are only six nations that have a ratio smaller than 100 support the argument that the U.S. is the preponderant nation in the global defense industrial order. (Neuman, 2006: 429-451)

Table 1. Arms Imports as % of Arms Exports

Country	Arms Imports as % of Arms Exports
USA	4.8
United Kingdom	50.0
France	27.6
Japan	15000.0
Germany	68.4
Russia	15.6
Italy	184.2
Canada	181.8
South Korea	1100.0
Israel	400.0

China	210.9
India	7000.0
South Africa	166.6
Spain	1071.43
Sweden	34.07
Switzerland	2200.0
Taiwan	13000.0
Turkey	4571.0
Greece	2111.12
Portugal	Imported $60 million but did not export
Poland	133.3
North Korea	21.4
Pakistan	10000.0
Egypt	Imported $700 million but did not export
Iran	1500.0
Brazil	900.0

Source: NEUMAN, Stephanie G. (2006). "Defense Industries and Global Dependency," *Orbis,* 50 (3), 429-451.

Especially after the RMA, which transformed the nature of military affairs and generated "a brand-new form of war, non-contact war" (Hudson Institute, 2005: 46), significance of military technology, military power and defense industry with regards to the international relations increased. Taylor (2005) argues that, "technological innovation is of central importance to the study of international relations, affecting almost every aspect of the sub-field."

The Gulf War clearly demonstrated the significance of military power with respect to international relations. Pioneer of the RMA, the U.S. increased its effectiveness in the international system after its superiority in the military arena was seen. Other countries had to modify their defense policies after recognizing the importance of RMA.

U.S.'s military superiority is a result of heavy investment in defense industries since the end of the Cold War. U.S.'s military R&D and military expenditures have been more than the military R&D and military expenditures of the fallowing eight nations including Japan, Germany, Russia, Canada, Italy, France, the U.K. and China.

These investments increased the technological gap between the U.S. defense industry and defense industries of other developed countries at such an

extent that the global defense industrial order, just like the international political order, became unipolar. (Escude, 1998: 55-75) The U.S. defense industry is now able to affect the domestic production capabilities of defense industries of other countries. (Neuman, 2005) Even the most developed countries' defense industries became dependent on the U.S. with regards to the advanced technologies and market demand. This gave the U.S. leverage to put pressure on other countries politically, which significantly contributed the creation of an unipolar international system.

3. INTERNATIONAL RELATIONS AT THE BEGINNING OF THE 21ST CENTURY

By the end of the Cold War, bipolar international system disintegrated. The United States has become the only superpower and the international system has become unipolar (Waltz, 1999: 693-700) as reflected in the global defense industrial order. Collapse of the Soviet Union led to the relative absence of balance of power competition. (Beinart, 2008: 83)

The U.S. is the most powerful country economically, scientifically, technologically, and militarily that builds a coalition to determine the rules of the game and to defend the status quo. It is the world's largest economy, the issuer if its reserve money, and the leading source and recipient of foreign investment. (Bergsten, 2008: 57) China, Russia, Japan, and the E.U are great powers of the international system.

Whether the international system will transform into a bipolar or multipolar system depends on economic, technological, political, and military developments in many countries and regions. China, Russia, Japan, the European Union, and India have potential to change the international system.

China's capabilities have been increasing continuously last twenty-five years in magnitudes that fundamentally restructure the international order. Chinese economy grew 9.7 % on average between 1979 and 2005. (Elwell, Labonte, and Morrison, 2007) Development of large quantity of electronics, computers, and advanced communications technologies indicate the transformation and modernization process of the Chinese economy. (Blasko, 2006: 13) Chinese economy is becoming more effective in the global economy. U.S. administration threatened China to suspend normal tariff treatment because of human rights issues, but had to make a U-turn as the ultimatum was to expire due to China's increasing influence in the world economy. (Lampton, 2007: 115-127)

China's economic development goes hand in hand with scientific and technological development. Chinese patent applications increased around 40 percent last year and above 50 percent the year before. (World Intellectual Property Organization [WIPO], 2008)

According to military experts, China's economic, scientific and technological developments, especially in the information technologies sector, do

diffuse to its military development. (Mulvenon, 2001) Its civil-military integration makes progress each year. It's developing advanced weapon systems that are more and more capable in comparison with the most advanced weapon systems of developed countries. Extraordinary performance of the Chinese economy let the Chinese leaders to increase defense expenditures more than ten-fold since 1989, which greatly enhanced China's military development process. (Singh, 2005: 688) All these economic, scientific, technological and military developments fundamentally change the balance of power in the international system.

U.S.'s relative superiority in scientific, technological, military and economic capabilities in comparison with other major powers is another important determinant of the future of the international system.

Future of the E.U. is also one of the most important variables. Whether Europe will be able to integrate so that it can constitute a united political, military and economic power will affect the international system.

Japan's increasing military expenditures and its military and civilian R&D expenditures can fundamentally affect the balance of power especially in Asia since Japan has a very strong scientific, technological and economic infrastructure.

Russia has lost power since the end of the Cold War. Nonetheless recovery has begun especially in the military arena. (Barany, 2008: 50) Politically stable, economically strong Russia, with its rich energy resources and advanced defense industry, can change equilibriums in many regions including East Europe, Caspian Region, Central Asia and East Asia. Actually, Russia has already changed equilibrium in Central Asia and the Caspian Region via the Shanghai Cooperation Organization (SCO). (Nickeson, 2007: 6-9) It is also expected that Russia's position on the Pacific Coast of Asia will reconsolidate in the coming decades. (Waldron, 2005: 726) Increasing military-technical cooperation between Russia and the region countries support this view. (Sanzhiev, 2005: 129)

India has one of the five largest economies in the world in terms of PPP. Its nuclear capabilities and proximity to China increase its geopolitical importance in world politics. Table 2 compares scientific, technological, economic and military capabilities of major actors in the international system.

TABLE 2. Economic, Scientific, Technological and Military Indicators (2007)

	China	U.S.A.	Russia	U.K.	France	Germany	India	Japan
GDP (PPP) (Billions$)	7,099	13,780	2,097	2,130	2,075	2,807	2,966	4,272
R&D Expenditures (PPP)(Billion $)	86.8	343.8	20.2	35.6	41.4	66.7	19.44	138.8
S&E articles	41,596	205,320	14,412	45,572	30,309	44,145	14,608	55,471
Citation of S&E articles	65,326	1,839,481	32,176	351,572	201,941	305,555	31,534	318,665
Researchers in R&D	1,223,756	1,387,882	464,357	183,535	204,484	282,062	117,528	709,691
Patent applications filed	5,456	52,280	507	5,553	6,370	18,134	686	27,731
Military Expenditures (Billions $)	58.3	547	35.4	59.7	53.6	36.9	24.2	43.6
Military R&D Expenditures (Billion$)	5.0	54.1	4.0	3.4	3.5	1.0	1.5	1.0
Number of Nuclear Weapons	200	10104	16000	200	350	0	60	0
Military Manpower (1000s)	2,255	1,438	1,037	196	259	284	1,325	238

Sources:

CIA. (2008). *The World Factbook 2008,* Washington, DC: CIA.

NATIONAL SCIENCE BOARD. (2008). *Science and Engineering Indicators 2008*, Arlington, VA: National Science Foundation.

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4. GLOBAL DEFENSE INDUSTRIAL ORDER AT THE BEGINNING OF THE 21ST CENTURY

The U.S. is the dominant nation in the global defense industry market today. U.S.'s dominance is reflected in the ranking of the biggest defense companies in the world as can be seen from Table 3. It is noticeable that all of the leading defense companies are U.S. and Western European companies.

Table 3. 20 Largest Arms Producing Companies, 2007

	Company	Country/Region	Defense Revenue (million $)
1	Lockheed Martin	US	38,513
2	Boeing	US	32,080
3	BAE Systems	UK	29,800
4	Northrop Grumman	US	24,597
5	General Dynamics	US	21,520
6	Raytheon	US	19,800
7	EADS	Europe	12,239
8	L-3 Communications	US	11,239
9	Finmeccanica	Italy	10,601
10	United Technologies	US	8,761
11	Thales	France	7,246
12	SAIC	US	6,511
13	KBR	US	5,967
14	Honeywell	US	5,000
15	General Electric	US	4,500
16	Rolls-Royce	UK	4,392
17	ITT	US	4,200
18	DCNS	France	4,154
19	Computer Sciences Corp.	US	3,600
20	Saab	Sweden	3,234

Source: Defense News. (2008).

<http://www.defensenews.com/static/features/top100/charts/top100_08.php?c=FEA&s=T1C> (3.11.2008)

U.S. companies also hold the top positions in the helicopters, armored vehicles, missiles/munitions, aircraft, satellites/space systems, and naval vessels defense market segments. Market shares of Lockheed-Martin, Boeing, BAE Systems, Raytheon, and EADS in missiles/munitions, aircraft and satellites/space systems segments are indicators of the consolidation in global defense industry. These five companies hold the top positions in these market segments.

The Herfindahl-Hirschman Index, a measure of industry competitiveness, is 2,393 out of 10,000 for the space industry, indicating a high level of concentration. (National Defense University [NDU], 2007: 3) High level of concentration is also seen in other market segments. Global defense industry consolidation has reduced the relative capital base and ability of other states' defense firms to invest in R&D and develop local IP, and therefore, reduced their competitiveness in the global defense market. (Defense Systems Daily, 2000)

The ranking and the distribution of the defense companies indicate that the U.S. is the leading and dominant nation in global defense industrial order. In the words of Battilega (2005):

"The United States has the largest homogenous internal defense market in the world. It owns over half of the global arms export market, with total sales larger than the aggregate sum of the next five countries. It has the strongest commercial information technology sector, the strongest university science base, and the most commercial experience in the global economy."

Table 4. Arms Sales, 2006 (in billions of US dollars)

Country	Arms Sales
United States	200.2
U.K.	37.3
France	19.5
Italy	11
China	7.6
Germany	6.1
Russia	6.1
Japan	5.2
Israel	4.6
India	3.5

Source: SPRI. (2008). *SPRI Yearbook 2008*, London: Oxford University Press.

The U.S. defense industry's dominant position in the global market strengthens by the help of the civil-military integration in the U.S. Civil-military integration accelerates military and technological development via various spin-off and spin-on mechanisms. (Bitzinger, 2004) It helps the development of defense industry

qualitatively and quantitatively. Many civilian sectors and areas such as microelectronics, computers, telecommunications equipment, nuclear power, biotechnology, chemicals, aviation and space have potential for supporting military technology development.

In particular, developments in the telecommunications sector were effective in the development of new C4ISR capabilities. Fast development of the U.S. information and telecommunications technologies sector helped the U.S. defense industry to increase the technological gap between the U.S. defense industry and the defense industries of other countries. According to military experts, the military victory of the United States in the Gulf War was a product of the technological and scientific capabilities of the United States as well as the developments in areas such as logistics , training , education, systems integration, and information based C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance). (Mulvenon and Yang, 2003: 1)

The U.S.'s military expenditures exceed total military expenditures of the fallowing ten countries as can be seen from the table below.

Table 5. Military Expenditures, 2007 (in millions of USD)

Country	Military Expenditures
Australia	15,097
Canada	15,155
China	58,265
France	53,579
Germany	36,929
India	24,249
Israel	12,233
Italy	33,086
Japan	43,557
Korea, South	22,623
Russia	35,369
Saudi Arabia	33,793
Turkey	11,066
United Kingdom	59,705
United States	546,786

Source: SPRI. (2008). *SPRI Yearbook 2008*, London: Oxford University Press.

Even if Russia is still the one of the most powerful nations militarily after the U.S., because of its relatively slow scientific and technological development, it is gradually losing its competitive edge. Russia lagged behind the U.S. in the micro-electronics, micro-miniaturizing and the software. (Bakshi, 2006: 449-466) Nikolay

Mikhaylov (1998), first Deputy Minister of Defense and former General Director of the large defense enterprise Vympel, rated Russia's capabilities relative to the global leaders in fifteen technology areas, which he deems critical. He gave four over four only in two areas, the laser technology and nuclear technology; three in engine platforms, unique experimental and testing facilities, and new materials technology; two in biotechnology, energy and energy conservation, industrial equipment, micro and nano electronics, and optoelectronics; and one in information technologies and environmental technology.

"According to Russian estimates, only thirty percent of Russian armaments are currently at the level of modern international standards." (Saradzhyan, 1999) Russian defense industry gradually lost its competitive edge especially after the sharp decline in military expenditures by the end of the Cold War. Nevertheless, by the help of increasing energy prices and a growing economy, Russia was able to allocate more funds to military expenditures especially after 2000. Russian military officials, recognizing the technological gap between the capabilities of the Russian and U.S. armies, plan to rely on nuclear weapons and asymmetrical warfare techniques in the short and mid-term. In the long-term, which includes the 2015 to 2025 timeframe, Russian officials are planning a dramatic shift away from material-intensive systems and toward science-intensive systems. (Fitzgerald, 2001: 1)

India has a large defense industry, but does not have capabilities to produce advanced weapon systems indigenously. It imports advanced weapon systems more than any other developing country. It imports roughly 70 percent of its armaments requirements. It is not self-sufficient, not even self-reliant in many critical areas. India's defense-industrial strategy aims to achieve self-reliance and to provide three fourth of its armaments requirements through domestic companies. (Mohanty, 2004: 42) It is expected by military experts that India will be dependent on other countries for many years to come with respect to advanced weapon systems.

The PLA wants to transform its defense industries so that they become world-class defense technology innovators. Especially after the Gulf War, The Chinese leadership placed the top priority on the development of state of the art weapon systems to improve PLA's fighting capabilities under conditions of high-tech warfare. (Kamennov, 2006: 70)

PLA changed its military structure from a framework that is ready to fight a war of attrition to a framework that is capable of fighting high-intensity, local wars of short duration against high-tech adversaries. (Battilega, 2005)

Having recognized the significance of civil-military integration, the Chinese leadership decided to restructure the defense industries so that they would be able to acquire dual-use technological capabilities. Chinese leadership fallows the strategy of coordinated development of economic construction and national defense and arm building. (Pollack, 2007: 635-650)

China's efforts to reorganize the defense industry, to integrate the defense and civilian industries and to increase efficiency and productivity bear fruit. China

was very successful in C4ISR modernization, thanks to the phenomenal rise of the Chinese IT sector, including telecommunications equipment manufacturing. (Gompert, Godement, Medeiros, and Mulvenon, 2005: 44)

According to military experts, military capabilities of the PRC have expanded substantially especially over the past decade. (Bitzinger, 2007: 5) High-tech output in key sectors of the Chinese defense industry accelerated. (Medeiros, Cliff, Crane, and Mulvenon, 2005: 16) PLA is being transformed from the world's largest territorial defense force into a multifunctional, mobile, smaller army. (Mockli, 2007: 1)

China is pursuing simultaneously the mechanization and informatization of its armed forces as part of its generation-leap strategy. "New generations of fighter aircraft, missiles, spacecraft, submarines, warships and other sophisticated hardware are coming off production lines at an impressive pace and quality" (Cheung, 2007) The J-10 is seen as an indicator that China is transforming from an arms-importing country to a producer of cutting-edge military technology. (Dreer, 2007: 647-660)

During the Cold War, France invested heavily in the defense industry and developed technologies in aircraft, tactical guided missiles, electro-optics and naval systems that are comparable to the most advanced systems globally. (Battilega, 2005) In 1999, France had seven companies in the top 100 defense companies. France recognized the importance of the command and control systems, IT technologies, the RMA after the Gulf War and decided to develop its defense industry in this direction. An alternative to the Global Positioning System became one of the priorities of France not to be dependent on the U.S.

Having recognized the superiority of the U.S. military and the increasing technological gap between the U.S. and European defense industries, the European countries have taken steps to increase the European military integration. Western European Armaments Group (WAG) was established in 1993 to increase the cooperation of major European countries in the defense industry. In 1998, France, Italy, Germany, the U.K., Sweden signed an agreement to increase cooperation among these countries. By the end of 1998, a deal between British Aerospace (BAE) and DaimlerCyrysler Aerospace (DASA) has been agreed, which would create a European Aerospace and Defense Company (EADC) that would be bigger than the American defense giants. But after British BAE acquired Marconi Electronic system, the defense arm of GEC, a EADC is seen less likely:

"In March 1999 Jurgen Schrempp, the chairman of DaimlerChrysler, categorically stated that there would be no single European Aerospace and Defense Company (EADC) to challenge the American defense giants." (Laird, 1999)

German DASA, the Spanish CASA and French Aeospatiale Matra formed the European Aeronautic, Defense and pace Company (EADS) in July 2000. Efforts to improve cooperation in the European defense industry continue.

5. FUTURE OF THE GLOBAL DEFENSE INDUSTRY

5.1. The RMA, Future Warfare and the Global Defense Industry

Among the driving forces that shape the future of the global defense industry are the transforming nature of warfare and the increasing interdependence among scientific, technological and the military capabilities especially after the RMA. The RMA is seen as the preliminary step of the future warfare. It is expected that importance, use and quality of precision-guided munitions, sensors, stealth aircraft, electronic countermeasures, and unmanned vehicles will increase. (Bowie, Haffa, and Mullins, 2003: 3-4)

It is forecasted that space capabilities, which significantly depend on scientific and technological capabilities, will also be essential to have superiority in the future warfare since it will be critical to collect, analyze and disseminate all kinds of information rapidly. According to U.S. national space policy authorized by the President in 2006, U.S.'s national security is critically dependent upon space capabilities, and this dependence will grow. (U.S. Office of Science and Technology Policy, 2006)

According to defense industry experts, "in all previous periods of significant change in military technology there was an accompanying transformation of global defense markets and industries." (Battilega, 2005) Today, at the beginning of the 21st century, revolutionary developments in information technologies and miniaturization are transforming the military technology, the nature of warfare and the global defense industry.

It is expected that countries, which own the militarily significant and critical technologies, will be more competitive in the defense industries and markets. (Hartley and Snadler, 2003: 361-380) These countries will be more effective on the dynamics of the international system because of the arms importing states' increasing dependence on foreign arms suppliers.

5.2. Future of the Chinese Defense Industry and Military Power

Another driving force that will shape the future of the global defense industrial order and international system is China's military-industrial complex and its military capabilities.

Nolt (2005: 26) argues that China will be incapable of projecting power in any way that could challenge the U.S. in the coming decades. Nonetheless, according to the U.S. Department of Defense (2006: 29), China "have the greatest potential to compete militarily with the United States and field disruptive military technologies that could over time offset traditional U.S. military advantages absent U.S. counter strategies." Actually, the U.S. has already taken steps to stop the transfer of militarily critical technologies to China by restricting the export of dual-

use goods. (Boese, 2007: 44)

According to Finkelstein (2004), who prepared a report for the U.S. National Intelligence Council (NIC) 2020 project, PLA will be more professional, more operationally capable and more sustainable by 2020. It will have regional force projection capabilities, not global force projection capabilities by 2020. PLA will improve its joint operations capabilities by increasing its C4ISR, maritime, and space capabilities.

U.K. Ministry of Defense's report estimates that if China's economic growth continues and if it invests in technology, China may generate a global power projection capability before 2025. "Although unlikely to match the U.S. force-on-force in the medium term, China would nevertheless be able to deploy a significant military presence wherever its interests were considered to lie." (Development, Concepts and Doctrine Centre [DCDC], 2007)

It is generally accepted that if China's economic growth continues, China will at least have regional force projection capabilities. If its economic growth continues and if it invests in militarily significant and critical technologies, it may become one of the first-tier producers in the defense industry and may acquire global force projection capabilities.

5.3. Scenarios about the Future of the Global Defense Industry

Three main scenarios about the future of the global defense industry market are given below.

1. Superiority of the U.S. in the global defense industry market continues. According to this scenario, the U.S. will still be the dominant player in the global defense market. It will spend as much as the rest of the world put together, it will prevent the technology transfer overseas, and the U.S. defense companies will acquire companies overseas. (PricewaterhouseCoopers, 2005) Some countries will prefer to decrease their investment in defense industries and buy foreign military equipment as Brazil, Argentina, and Indonesia did. (Neuman, 2005: 17) Some countries will try to specialize in specific sectors of the defense industry. As some European companies now do, some companies will opt to do business with the U.S. companies. They will invest in the U.S., establish subsidiaries in the U.S. or cooperate with the U.S. companies. Other countries such as China and Russia will seek asymmetric capabilities to limit the effect of the U.S.'s technological superiority.

2. U.S.'s superiority in militarily critical technologies erodes. According to this scenario, other countries, especially China, Russia and western European countries will close the technological gap. Fast global diffusion of technology will lead to a multipolar armaments industry system. U.S. military expenditures will significantly be reduced while the rest of the world will increase their expenditures. The defense industry supply chain will be globalized. (PricewaterhouseCoopers,

2005)

3. The U.S. is the strongest player in the global defense industry. According to this scenario, Russia and China will have a relatively self-sufficient defense industry. European countries will cooperate with the U.S. The Middle Eastern, Latin American and African countries will import weapon systems from both sides while trying to increase their indigenous capabilities. (Battilega, 2005)

It is obvious that the future of the global defense industrial order will certainly not be exactly the same as forecasted in the three scenarios since it is impossible to forecast the future of some variables. Nonetheless, future of the global defense will possibly be similar to one of these scenarios, may be a hybrid variant of these scenarios and may include elements from each of the three scenarios.

6. SCENARIOS ABOUT THE FUTURE OF THE INTERNATIONAL SYSTEM

As examined in Section 2, the global defense industrial order is a good indicator of balance of power in the international system. So, based on the three scenarios about the future of the global defense industrial order, scenarios about the future of the international system can be shaped.

6.1. The American Century

The U.S.'s superiority in scientific, technological, economic, and military capabilities continues. The U.S. is still the only superpower that builds a coalition to determine the rules of the game.

China's economic growth slows down. It strives to solve its economic and social problems. Its national innovation system is not productive as much as the developed nations' national innovation systems. Its scientific and technological capabilities stay behind the developed nations' capabilities. It increases its military capabilities; nonetheless it is dependent on other countries with regards to the most advanced weapon systems.

European Union enhances its economic integration; nonetheless it is not successful in political and military dimensions. Its share in global economic activities decreases. Russia continues to be a military power. Its economy depends on the energy sector. Its private sector is not competitive in global markets in other sectors. It stays behind the developed countries with regards to scientific and technological capabilities including the militarily significant ones.

Japan continues to be one of the strongest countries in terms of economic, scientific and technological capabilities. Indian economy becomes one of the largest economies. Nonetheless, India strives to solve its poverty and poor infrastructure problems. Its scientific and technological development stays behind the developed countries. Its military capabilities still depend on foreign arms imports.

U.S.'s competitive private sector, its scientific and technological

superiority, its military expenditures, and its investments in military and civilian R&D make it the leading producer in the defense sector. Russia's share in global defense industry market declines because of its uncompetitive technology-intensive private sectors and because of its relatively limited financial resources.

The U.S.'s superiority in military capabilities increases. It enhances battlefield situational awareness significantly by the help of space capabilities, information technologies and other technological developments. Robots and unmanned vehicles are used extensively in military operations.

6.2. The Chinese Century

U.S.'s leadership in scientific, technological, and military capabilities erodes at a great extent. Chinese economy surpasses the U.S. economy in terms of Purchasing Power Parity (PPP) by 2015. Chinese economy transforms from a manufacturing economy to an information economy. China becomes one of the leading countries in science and technology. Scientific and technological developments diffuse to military development. It develops advanced weapon systems technologically comparable with the most advanced weapon systems of developed countries. PLA transforms into a high-tech army with advanced C4ISR, network centric warfare, precision strike, and space capabilities. China becomes one of the first-tier producers in the defense industry.

As in the first scenario, European Union cannot be successful in political and military integration. Russia continues to be a military power; nonetheless it stays behind the developed countries with regards to economic, scientific and technological capabilities. Japan continues to be one of the leading countries in terms of economic, scientific and technological capabilities.

6.3. Multipolar World

U.S.'s leadership in scientific, technological, and military capabilities continues, nonetheless its superiority erodes at a great extent. As in the second scenario, China's economic, scientific, technological and military capabilities come near the U.S.'s capabilities.

The E.U. enhances its economic integration. Successful steps are taken towards political and military integration. Russia becomes one of the leading countries militarily. Its economy diversifies and becomes much more competitive in global markets. Energy sector provides financial resources for its economy. Scientific and technological developments accelerate by the help of increasing investments in R&D. Scientific and technological developments diffuse to military development. Russia produces advanced weapon systems technologically comparable to the weapon systems of the U.S.

Japan continues to be one of the leading countries in economic, scientific and technological capabilities. Indian economy becomes one of the largest economies. Fast economic growth helps it to solve its poverty and poor infrastructure problems at some extent. Its scientific and technological

development, especially in the software sector, accelerates.

Scientific and technological breakthroughs occur in the most developed countries especially in the materials technology, nanotechnology, biotechnology, information and communication technology and cognitive science. These breakthroughs transform the societies of the most developed countries like the agrarian and industrial revolutions did. Scientific and technological developments lead to substantial improvements in almost every aspect of life.

The U.S. protects its strongest player status in the defense sector. China becomes one of the first-tier producers in the defense industry. International investments and trade increase, international institutions become more influential and the international system becomes multipolar.

7. CONCLUSION

As the scenarios illustrate, international system is a complex system. Interactions of economic, political, scientific, technological, and military factors affect its dynamics. Three scenarios about possible futures of the international system were built in this study based on the scenarios about the future of the global defense industrial order since global defense industrial order is a good indicator of balance of power in the international system.

The international system will certainly be different from each of the three scenarios. It will probably be a mixture of the three scenarios. It will contain elements from each scenario and elements that are not mentioned in these scenarios. Nonetheless, these scenarios provide a mental framework to be able to understand the complexity of the international system, to be aware of the uncertainties and trends that shape the future and to forecast some of the characteristics of the future of the international system as much as possible so that we can prepare for the challenges lying ahead and create a better future.

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