

Demographics and Security —Defense Capabilities Building and Economic Hegemony towards the 22nd Century—*

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Abstract

Demographics affect security on both the micro level (defense capabilities building) and the macro level (economic hegemony). Moreover, developed countries and emerging economies are currently experiencing low birthrates and aging populations that are considered unprecedented in the history of humankind; this situation is expected to cast a large shadow on the security environment through mid- and long-term demographics. One answer to this dilemma on the micro-level (defense capabilities building) is capital intensification of the military. Meanwhile, on the macro level, it is believed that the center of gravity of the world economy will shift from the Asia-Pacific rim to the Indian Ocean and Atlantic rims following these demographic changes. Moreover, there is the possibility that the “rebalancing policy” of the United States, whose national strength is in relative decline, could rear its head again. A discussion against the background of mid- to long-term global demographics on the desirable direction of defense capabilities development and security policy for Japan towards the 22nd Century as it enters the low birth rate, aging population era is overdue.

Introduction

The population explosion in developing countries had been the traditional concern related to demographics regarding the security environment. It had been the main cause of developing countries’ inability to escape poverty and the source of their political turmoil and regional instability. When the population grows without a significant rise in the income level (Gross Domestic Product: GDP), a vicious circle develops in which poverty breeds further poverty. Population growth mainly in developing countries was called “population explosion,” which was believed to be an obstacle to economic growth.¹ This was a general consensus during the Cold War. Aid for family planning conducted by international aid organizations, national governments and non-governmental organizations (NGOs) were aimed at promoting the accumulation of capital in developing countries in addition to the humanitarian objective of improving the health of mother and child. China’s one-child policy was also intended as a means to escape the vicious circle. It

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¹ Jeffrey D. Sachs, *The End of Poverty: Economic Possibilities for Our Time* (New York: Penguin Books, 2005), pp.65-66.

was assumed at the time, moreover, that the demographics of developed countries would not see many changes and remain stable over the long-term. However, this assumption has suffered a serious setback since the turn of the millennia, as developed countries and emerging economies encountered low birth rates and aging populations, which would come to have a major impact on recruiting troops for the military. This grasps the relationship between demographics and security from a micro perspective, leading to the question of the balance between personnel and equipment in the composition of the military.

From a macro perspective, demographics is connected to economic hegemony and the security environment. Globalization of economic activities has made great progress since around the end of the Cold War. As a result, even low value-added daily goods came to be traded, while capital, technology and other elements that had historically been constraints for the economic growth of the developing countries came to flow from the developed countries in massive amounts in the form of direct investment. This may seem at first glance to have nothing to do with demographics. But for developing countries, freedom from the constraint on growth means growing populations do not lead to the vicious circle of poverty. In other words, it becomes possible for developing countries to increase per capita GDP even while their populations are growing and to rapidly increase their economic power (\approx national power) as the product of the two (per capita GDP and populations). This is also related to the following: developed countries and emerging economies encountering low birth rates and aging populations will see their economic power stall as the product of their populations and per capita GDP stagnate over the long-term, resulting in the narrowing, or even reversal, of the gap between them and the developing countries. The relative relationship of national power between developed countries and developing countries will change dramatically as the result.

In this manner, there is the potential for demographics to have a major impact on the composition of the military (a micro-level issue) and economic hegemony (a macro-level issue). Particularly since the end of the Cold War and up to now in the 21st Century, Japan and other developed countries and emerging economies are facing low birth rates and aging populations that are unprecedented in the history of humankind.² Countries are already beginning to adopt measures in response, such as rationalization and efficiency enhancement. Meanwhile, the United Nations and other institutions are issuing long-term population forecasts into the 22nd Century, from which the potential can be discerned that the center of gravity of global economic activities will shift from the current Asia-Pacific region to the Indian Ocean and subsequently Atlantic regions. This article is an attempt to consider the long-term future trends in the security environment from both the micro and macro perspectives based on these demographics.

1. The Debate concerning Demographics and Security

The impact of demographics on security has been debated from both the micro and macro perspectives. The main issues are (1) the development and construction of defense capacities under certain demographic assumptions (particularly concerning the young working population), from

² However, Hiroshi Yoshikawa cites a paper by Kentaro Murakawa in giving the example of Classic Greece for fewer children and declining populations as the result of low birth rates. Hiroshi Yoshikawa, *Jinko to Nihonkeizai—Chuoju, Inobeeshon, Keizaiseichou* [Population and the Japanese Economy—Aging, Innovation, Economic Growth] (Tokyo: Chuko Shinsho, 2016).

the micro perspective, and (2) the impact of demographics on economic power and changes in the geopolitical security environment, from the macro perspective. Note that around the turn of the millennia, the emergence of low birth rates and aging populations in developed countries and emerging economies became the watershed for this change in the debate, in addition to the end of the Cold War and the September 11 terrorist attacks in the United States.

(1) The Debate before the End of the Cold War

Theoretically, a decline in the birth rate should promote economic growth, since it can be expected to increase the ratio of the labor force to total population, raise the labor participation rate of women (which in turn causes a further drop in the birth rate), increase education and health-related expenditures per child (raising the quality of human capital), and increase savings per worker, leading to capital accumulation.³ Because of this, the demographic concern was population growth. Given the improvements in food and hygiene in the modern age, the population explosion in developing countries was seen as an obstacle to economic growth. The debate over demographics and social stability can be tracked back to *An Essay on the Principle of Population* (1798), authored by Thomas Robert Malthus. Although the book does not discuss security, its perspective that food production cannot keep pace with population growth and may lead to growing disparity can be considered the starting point for the subsequent debate concerning demographics.⁴ It was the publication of *The Limits to Growth*⁵ in 1972, the year before the First Oil Crisis, by the Rome Club, a think tank consisting of experts, etc. worldwide, that reignited interest in population issues in the post-WWII world. The report warns that population growth would lead to resource depletion and that humanity would reach the limits to its growth within 100 years. This notion that “population growth puts pressure on non-renewable resources” would come to be widely shared throughout the Cold War era. In December 1974, the U.S. National Security Council issued *National Security Study Memorandum 200* (the *Kissinger Report*)⁶. Adopted as policy guidance at the time by the Ford administration, its basic understanding is close to that of *The Limits to Growth*. However, the demographics of developing countries is viewed from the American perspective, as the report argues that population explosion destabilizes the foundations of the local governments, creating security concerns for the United States. Thus, the *Kissinger Report* recommended to the U.S. Government the implementation of development aid for developing countries to support population programs. The background for the compilation of a report with such content is believed to be the First Oil Crisis, touched off by the 1973 Arab-Israeli War the previous year and the rise of “resource nationalism,” under which resource producer countries forcefully argued for ownership of resources and the right to approve their exploitation. In 1995, Lester Brown published *Who Will Feed China?*, in which he took up the issue of food.⁷ The premise here was that improvements in

³ International Monetary Fund, *Regional Economic Outlook: Sub-Saharan Africa, Navigating Headwinds* (Washington, D.C.: International Monetary Fund, 2015), p.30.

⁴ Thomas Robert Malthus (reprinted by Macmillan, 1926) *An Essay on the Principle of Population* (Oxford: Oxford University Press, 1798), pp.18-38.

⁵ Donella H. Meadows et al., *The Limits to Growth* (New York: Universe Book, 1972).

⁶ *National Security Study Memorandum 200*, http://pdf.usaid.gov/pdf_docs/Pcaab500.pdf. (accessed October 25, 2017). It is also called the *Kissinger Report* since then Secretary of State Henry Kissinger led the compilation of the report.

⁷ Lester Brown, *Who Will Feed China?* (New York: W.W. Norton & Co., 1995).

the gustatory lifestyle of the Chinese (an increase in meat consumption) as the result of economic growth and the resulting increase in the consumption of feed grain would cause a global food crisis. The book pointed to a synergistic effect on the food crisis between economic growth and population growth in China. This could be considered a reconstruction of the Malthusian argument concerning demographics for the 21st Century, augmented by the perspective of economic growth.

Since then, concern over a fight for resources has waned, and population explosion ceased to be a cause for serious concern over security. Drawing attention in its stead were age composition and immigration. When the September 11 terrorist attacks occurred in the United States, demographics once again came to be studied as a factor leading to failed states and spurring conflict. Specifically, population growth/explosion in developing countries, together with insufficient employment opportunities for youths (i.e. high youth unemployment rates) in particular, can sow fertile grounds for the proliferation of radical religious beliefs. Moreover, being unemployed means not only that the individual is not engaged in economically productive activities but also that he or she is not participating in social life and activities, leading to isolation within the local community.⁸ Population and security (particularly counterterrorism measures) came to be debated from this perspective, and UN organizations and the World Bank actively provided support for measures dealing with population and employment issues through development aid.⁹

(2) Recent Debate: Micro and Macro Perspectives

With regard to the relationship between demographics and security, Brian Nichiporuk proposes from the micro perspective the introduction of capital-intensive forces in developed countries.¹⁰ This is based on the fact that in Europe, the purpose of the military has shifted from national defense to dispatch outside of Europe, which means that the military must be a compact organization with high expertise and mobility. Nichiporuk calls this “a capital-intensive military,” and he studies the transition to this modern military from a homeland defense military (manpower-intensive military) based on the draft system of the Cold War era. Furthermore, Nichiporuk claims that it is important to seek to enhance the capability of the troops by stepping up investment in their education and training, since the number of troops (human resources) is small in capital-intensive militaries. On the other hand, he states that when aiming at a capital-intensive military, multilateral cooperation among the capital-intensive militaries of countries experiencing low birth rates and aging populations is essential to overcoming the overwhelmingly rapid pace of rising costs for defense equipment. At the same time, Nichiporuk raises the following three points as the functions that national defense policy fulfills in relation to demographics in countries where the population is rising.¹¹ First, the military has the effect of reducing the unemployment rate for youths. Second, a domestic sense of unity can be expected from youths enrolling in the military, particularly in multiethnic countries. And third, a national defense policy helps with responding to domestic

⁸ Keishi Ono, “*Tero Yobo Shudan to shite no Seihi Kaihatu Enjo* [Official Development Aid as a Tool for Preventing Terrorism],” *Boei Kenkyusho Kiyō* [NIDS Security Studies] Vol. 10, No. 3 (March 2008), pp.3-13.

⁹ It is the understanding of the World Bank that it is necessary to create 100 million new employment opportunities for the unemployed and for work opportunities for youths in the Middle East and North Africa regions. (World Bank, *World Bank Annual Report 2006* (Washington, D.C.: World Bank, 2006), p.50.)

¹⁰ Brian Nichiporuk, *The Security Dynamics of Demographic Factors* (Santa Monica: RAND Corporation, 2000), p.27.

¹¹ *Ibid.*, p.29.

security issues. The problem that has been pointed out for developing countries is that in many cases, only part of their military consists of elite units and the remaining majority is second-rate.

Since the end of the Cold War, studies from geopolitical and macro perspectives emerged concerning the relationship between demographics and security. The pioneering study here is Samuel P. Huntington's *The Clash of Civilizations and the Remaking of World Order*, which examines the relationships among demographics, culture, religion, and hegemony in connection with the progress in globalization. There, Huntington claims that globalization enhances self-awareness of (cultural and religious) identity, but that demographics alter the relative composition of this identity, leading to destabilization of the state of affairs.¹² Mary Kaldor calls wars based on exclusive identities independent from states "New Wars."¹³ On the other hand, according to Emmanuel Todd and Youssef Courbage, demographics (particularly declining birth rates) do indeed cause social and political confusion (revolution, war, etc.) within the community despite this is a transient phenomenon, with the confusion leading to convergence.¹⁴ In other words, Huntington sees demographics altering the relative relationship between communities, whereas from Todd and Courbage's perspective, demographics result in internal changes in each community, and clashes between communities are a secondary effect. These are attempts to grasp the long-term relationship between demographics and war from the perspective of social history. Elsewhere, there have also been efforts to study the relationship between the more recent low birth rates and aging populations and defense policy and security.

Douglas A. Sylva posits the idea of "geriatric peace," in which social security expenditures put pressure on defense expenditures in countries that have transitioned to low birth rates and aging populations, such as the Western European countries, causing developed countries to no longer take militarily aggressive actions.¹⁵ Gunnar Heinsohn constructs his demographic theory on the premise that the youth bulge is a socially destabilizing factor, which can be regarded as the other side of the coin of "geriatric peace."¹⁶ From the U.S. perspective, Jennifer Dabbs Sciubba warns that the economic decline of Japan and Europe will lead to a decline in their capacity to support U.S. security policy, most prominently the war on terror.¹⁷ She says in particular that European countries will prioritize securing and maintaining internal stability and the support for external relations, including those with the United States, will be reduced. Meanwhile, Gordon G. Chang points to the possibility that China will act aggressively in order to resolve diplomatic and security issues before its national power declines as the result of a low birth rate, aging society,

¹² Samuel P. Huntington, *The Clash of Civilizations and the Remaking of World Order* (New York: Simon & Schuster, 1996), pp.66-68.

¹³ Mary Kaldor, *New and Old Wars: Organized Violence in a Global Era* (Stanford: Stanford University Press, 2007), pp.6-8.

¹⁴ Emmanuel Todd, Youssef Courbage, trans., Harumi Ishizaki, *Bunmei no Sekkin* (A Convergence of Civilizations: The Transformation of Muslim Societies Around the World) (Tokyo: Fujiwara Shoten, 2008), pp.58-72.

¹⁵ Douglas A. Sylva "Europe's Strategic Future and the Need for Large-Family Pronatalism: A Normative Study of Demographic Decline," Susan Yoshihara and Douglas A. Sylva eds., *Population Decline and the Remaking of Great Power Politics* (Washington, D.C.: Potomac Books, 2012), pp.98-99.

¹⁶ Gunnar Heinsohn (trans., Kazuo Inomata), *Jibakusuru Wakamonotachi: Jinkougaku ga Keikokusuru Kyougaku no Mirai* [Söhne und Weltmacht: Terror im Aufstieg und Fall der Nationen], (Tokyo: Shincho Shinsho, 2008).

¹⁷ Jennifer Dabbs Sciubba, "The Defense Implications of Demographic Trends," *Joint Force Quarterly*, issue 48 (January, 2008), p.122.

and declining population.¹⁸ Elsewhere, Silva argues that immigration policy as a response to low birth rates and an aging society also confront Western European countries with a policy choice between “economic growth and the maintenance and transmission of traditional culture.”¹⁹ The debate is further complicated by the injection of the acceptance of refugees as “humanitarian assistance,” leading to a huge debate in many quarters after the multiple, simultaneous terrorist attacks in Paris on November 13, 2015. Also raised as a secondary impact of the fiscal pressure on defense expenditures from low birth rates and an aging society is the decline in the military personnel dispatched for humanitarian support, previously an area where developed countries had been actively engaged.²⁰ This indicates that the major player of dispatching military personnel for maintaining peace, such as UN peacekeeping operations and humanitarian assistance, is shifting from European countries to developing countries and emerging economies.

As we have seen, there are three directions, broadly speaking, in the debate relating to demographics and security. First is the claim that demographics will be a destabilizing factor in the international state of affairs. This is based on the classical North-South problem perspective that the income gap between developed countries and developing countries will not be bridged, leading to a fight over resources between the two sides. The second direction considers the micro issues on the domestic front, while the third approaches the issue from a macro, geopolitical perspective. These last two directions are dependent variables, so to speak, of the low birth rates and aging societies in developed countries and emerging economies.²¹ It can be understood from this that low birth rates and aging societies have become important explanatory variables for security in the post-Cold War world. Indeed, this is a new situation where the birth rate is declining and the average lifespan is growing rapidly and continuously worldwide, “an unprecedented event in human history.”²²

2. The Micro Issue: Defense Capacity Building in an Era of a Low Birth Rate and Aging Population

In this section, we consider the relationship between demographics and security from the micro perspective. The large, direct issue is the decline of the youth labor force as a consequence of the low birth rate, which directly translates to a decline in the recruiting target population for the military. At the same time, the mission of the military is expanding rapidly, mainly in non-traditional areas (peacekeeping, humanitarian assistance and disaster relief, counterpiracy, etc.), and countries are searching for ways to respond to the decline in the youth labor force without reducing the functions of their military.

¹⁸ Gordon G. Chang “The Geopolitical Consequences of China’s Demographic Turmoil,” Yoshihara and Sylva eds., *Population Decline and the Remaking of Great Power Politics*, pp.172-175.

¹⁹ Sylva “Europe’s Strategic Future and the Need for Large-Family Pronatalism,” pp.105-107.

²⁰ Scuibba, “The Defense Implications of Demographic Trends,” p.122; Suzan Yoshihara “Conclusion: Population, Power, and Purpose,” Yoshihara and Sylva eds., *Population Decline and the Remaking of Great Power Politics*, pp.205-206.

²¹ Developing countries following the developed countries and emerging economies into low birth rates and aging societies as the result of rising income levels has raised concern as a “flying geese pattern population shift.” Keiichiro Ohizumi, *Oite Yuku Ajia* [An Asia that Grows Old], (Tokyo: Chuko-shinsho, 2007), Chapters 1 and 2.

²² Susan Yoshihara and Douglas A. Sylva, “Introduction,” Yoshihara and Sylva eds., *Population Decline and the Remaking of Great Power Politics*, p.1.

(1) The Demographic Outlook for Japan

Regarding Japanese demographics, the rapidly declining birth rate and aging society not seen elsewhere in the world are often cited. However, these are not new phenomena; some experts were taking note of them during World War II. As early as 1940, Tomonaga Nakagawa at the National Institute of Population Research under the Ministry of Health and Welfare (now National Institute of Population and Social Security Research from the Ministry of Health, Labour and Welfare) forecasted that the Japanese population would reach 122.74 million 60 years later in 2000 and would decline thereafter, entering into an era of low birth rates and an aging society.²³ Although the actual population in 2000 was 126.93 million and population decline actually began in 2011 (when the population was 127.83 million), Nakagawa's forecast from more than 70 years ago was extremely accurate.

According to the National Institute of Population and Social Security Research, *Population Projections for Japan* (January 2012), the Japanese population, at 128.06 million in 2010, will dip below 100 million in 2048 (medium-fertility and mortality estimate; hereinafter the same) and fall to 86.74 million in 2060, a 50-year fall of 41.00 million, or 32.3%, from 2010 (Figure 1).²⁴ By 2110, the total population is forecast at 42.86 million, a two-thirds drop in 100 years. A major problem for a society with a declining population is that the inertia caused by the composition of the population ("population inertia" or "population momentum") pushes the population strongly in the direction of decline. Specifically, the long-term population level is determined by the number of births and deaths, excluding migration. The birth rate at which the population remains stable without gain or loss is called "replacement level fertility," considered to be roughly 2.07 for Japan. In Japan, however, the youth population has declined significantly due to the long-term decline of the birth rate (progressively low birth rate and aging society). Since the birth rate at the "replacement level" is a birth rate that merely maintains the population in that specific age bracket, this is insufficient to replace the large elderly population that passes away of old age. Therefore, the population decline will continue for decades even after the birth rate recovers, a phenomenon known as "population inertia."

The following is an overview of "population inertia" and its effect on other countries. In addition to showing the 2060 population pyramid forecast for Japan, Figure 2 also shows the forecast for Germany, which also faces a low birth rate and an aging society, and France, whose measures to raise the birth rate are producing results. The 2005 birth rates in these three countries were 1.26, 1.34, and 1.94 for Japan, Germany, and France, respectively. By 2010, these figures

²³ Hiroyuuki Takaoka, *Souryokusen Taisei to "Fukushi Kokka": Senki Nihon no "Shakaikaikaku Kousou"* [Total War System and the Welfare State: The Social Reform Vision in Wartime Japan], (Tokyo: Iwanami Shoten, 2011), pp.184-194.

²⁴ *Population Projections for Japan (January 2012)* by the National Institute of Population and Social Security Research is the latest population estimate by the Institute available currently (English version is available at <http://www.ipss.go.jp/site-ad/index_english/esuikei/ppfj2012.pdf>). The estimate forecasts the total Japanese population on October 1, 2015 at 126.60 million, but the final figure for the total population on October 1, 2015 announced by the Statistics Bureau, Ministry of Internal Affairs and Communications was 127.11 million. (The final figure for the total population on July 1, 2016 published by the Bureau was 127.00 million.)

had improved slightly to 1.39 in Japan and Germany and 2.03 in France.²⁵ As you can see from this, among the three countries, France is already maintaining its birth rate at close to 2.0. These trends will also affect long-term demographics. The French population is expected to rise by 17% between 2010 and 2060,²⁶ while Germany and Japan's are expected to fall by 20% and 32% respectively. The birth rates for 2060 are forecast to be 1.35 and 1.40 for Japan and Germany, against 1.95 for France. In other words, particularly in Japan's case, it has a population structure where it is difficult for the population to start growing again even if the birth rate rises due to the inertia from the population decline. This is compounded by the lack of recovery in the birth rate, leading to a major, long-term population decline. In 2060, the French will have entered a period of stability when there will be no significant fluctuations of the population (as its population pyramid is "bell-shaped"), while the Japanese and German pyramids will be "funnel-shaped," representing large numbers of the elderly and low numbers of the young. As the result, while the proportion of children (0-14 years old) in 2060 will be 16.4% in France, it will be 11.5% in Germany, and even lower in Japan, at 9.1%. This indicates that the inertia of a declining population will continue to affect Japan's demographics even in 2060. Currently, both the public and private sectors are making efforts to counteract the effects of population decline in Japan. However, it is necessary to assume a "declining population" when considering security from a long-term perspective, regardless of the effect of measures against population decline, since inertia towards population decline will continue to exert its force over the long-run demographically.²⁷

(2) Rationalizing the Military and Enhancing Its Efficiency

A low birth rate and aging society directly affect the military through a decline in the young working age population, who are the target of recruiting for soldiers. The low birth rate and aging society is progressing particularly quickly in Japan compared to American and European developed countries, and the situation is serious.²⁸ At the same time, developed countries must continue to deal with flashpoints of conflict and terrorism, mainly in developing countries. In the past, developed countries, and Western European countries in particular, actively dispatched troops for UN peacekeeping operations (PKOs). However, the future reduction of the military in

²⁵ National Institute of Population and Social Security Research, "Population Projections for Japan," *Jinkou Mondai Kenkyuu Shiryuu* (Population Research Series) No.327 (January 2013), p.49. Japan and Germany made further improvements to 1.42 and 1.47 while France slipped back to 1.98, but Japan still lagged behind the other two (Cabinet Office, *Heisei 28-nenban Shoushikataisaku Hakusyo* [Low Birth Rate Countermeasures White Paper 2016], Nikkei Printing Inc (2016), p.29.) Japan's total fertility rate in 2016 was 1.44 (definitive value) (Ministry of Health, Labour and Welfare, *Heisei 28-nen (2016) no Goukeitokusyususeiritsu (kakuteisuu) no Gaikyou* [Overview of Total Fertility Rate (definitive value) for 2016] (published on September 15, 2017).

²⁶ *Ibid.*, p.50.

²⁷ For government efforts concerning population decline, see Vitalizing Town, People and Job Headquarters, Cabinet Office webpage (Japanese), <http://www.kantei.go.jp/jp/singi/sousei> (accessed on December 7, 2015). For requests, proposals, etc. from the private sector, see Japan Business Federation (Keidanren) website (English) (<https://www.keidanren.or.jp/en/policy/index02.html>).

²⁸ Yumiko Murakami raises the need to use the elderly in the workforce in order to achieve economic growth in the era of low birth rates and an aging society, given the relatively high education and skill levels of the Japanese elderly (Yumiko Murakami, *Buki to Shite no Jinkougen Shakai: Kokusai Hikaku Toukei de Wakaru Nihon no Tsuyosa* [Society with a declining population as a weapon: Japan's strength revealed by international statistics comparison], (Tokyo: Kobunsha Shinsho, 2016), Chapters 1 and 2.) However, even if this argument is valid as a general point across jobs in general, it is difficult to apply to organizations such as the military or SDF.

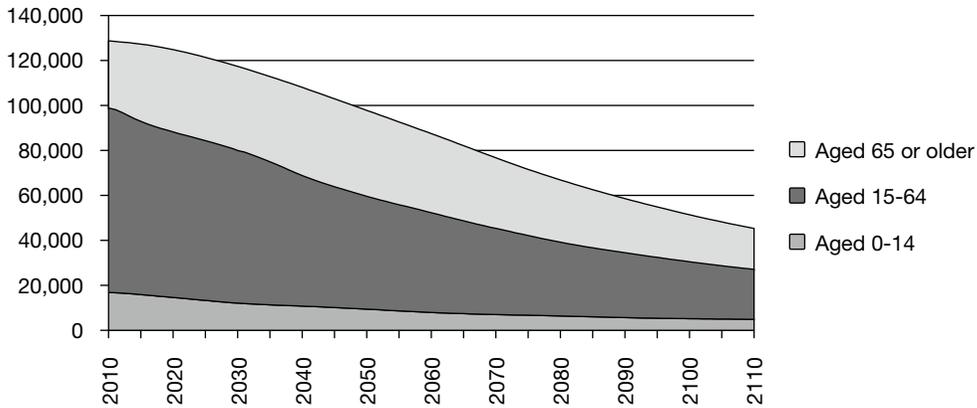
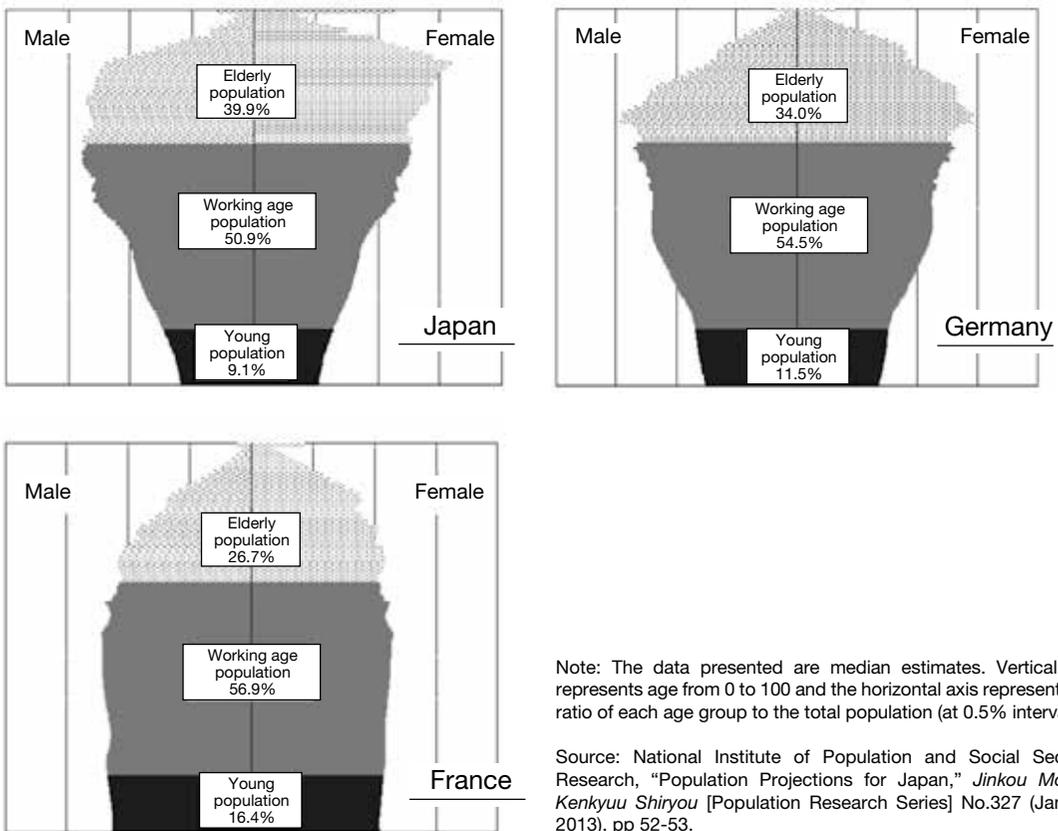


Figure 1 Projection of the Japanese Population Size (2010-2110) [Unit: 1,000 people]

Note: The data presented are median estimates.

Source: Formulated based on National Institute of Population and Social Security Research, "Nihon no Shourai Sukei Jinkou [Population Projections for Japan]," *Jinkou Mondai Kenkyuu Shiryuu* [Population Research Series] No. 327 (January 2013): 65-66.



Note: The data presented are median estimates. Vertical axis represents age from 0 to 100 and the horizontal axis represents the ratio of each age group to the total population (at 0.5% intervals).

Source: National Institute of Population and Social Security Research, "Population Projections for Japan," *Jinkou Mondai Kenkyuu Shiryuu* [Population Research Series] No.327 (January 2013), pp 52-53.

Figure 2 Population Pyramids of Japan, Germany, and France (prospects in 2060)

size is inevitable in the developed countries due to low birth rates and aging societies as well as the corresponding increase in social security expenditures and other budgetary restraints.²⁹ Developed countries are downsizing their militaries and enhancing their mobility to compensate for these quantitative constraints. The European members of the North Atlantic Treaty Organization (NATO) in particular made significant progress in downsizing, given the significant reduction in the military threat from the former Soviet Union and the Warsaw Pact forces in the post-Cold War era. Together with this reduction in military threat, progress in military technology accounts for the downsizing and enhanced mobility of the military. Technological innovation in information and communication made it possible to conduct broad-range patrol with small units; it also created the belief that improvements in the rapid response capabilities of operating troops make it possible to respond to post-Cold War security challenges with small militaries.³⁰ In the United States, this was promoted by Secretary of Defense Donald Rumsfeld (in office from January 2001 to December 2006) in the George W. Bush administration under the so-called “Rumsfeld Doctrine.”³¹ In Japan, there was the introduction of Ready Reserve Self-Defense Official, downsizing some divisions to brigades, and the reduction in mainstay equipment that began with the *National Defense Program Outline in and after FY 1996* adopted by cabinet decision in December 1995. These actions were in line with this worldwide trend.

Developed countries have moved in the direction of low birth rates and aging societies at speeds beyond expectations, and the limits to responding with downsizing the military and enhancing its mobility have begun to run up against a wall. One solution is opening the doors of the military to women.³² To be sure, this objective, particularly in the United States, has not been implemented to secure the necessary troops; it is being conducted as part of the policy for “diversity management.”³³ Diversity management means eliminating social, personal, and institutional barriers based on prejudice and discrimination due to race, religion, gender, nationality, age, physical or mental handicap, etc. and opening opportunities for employment and promotion to

²⁹ For long-term forecasts of increasing social security expenditures under low birth rate and aging society conditions using Japan as an example, see Yukio Noguchi, *500-mannin no Hatarakite ga Kieru 2040 Mondai--Roudouryoku Genshou to Zaisei Hatan de Nihon ha Houkaisuuru* [The 2040 Problem, When 15 Million workers Disappear: Japan Collapses from Labor Force Decline and Fiscal Breakdown], (Tokyo: Diamond, Inc., 2015), Chapters 6 and 7.

³⁰ The so-called “revolution in military affairs (RMA).” There are many studies on this subject. MacGregor Knox and Williamson Murray, *The Dynamics of Military Revolution, 1300–2050* (Cambridge: Cambridge University Press, 2001); Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton: Princeton University Press, 2004) are given here as representative examples.

³¹ During the Iraq war in 2003, there was a debate between Secretary of Defense Donald Rumsfeld and Deputy Secretary of Defense Paul Wolfowitz on one hand and General Eric Shinseki, Chief of Staff of the Army, and other members of the military on the other regarding the Rumsfeld Doctrine on the number of troops necessary. For a theoretical look into this debate, see Keishi Ono, “*Gunji koudou ni Kakawaru keihi Bunseki—2003-nen Iraku ni taisuru Gunji Sakusen no Senpi ni tsuite* [Cost Analysis of U.S. Military Operations in Iraq], *Boei Kenkyusho Kiyo* [NIDS Security Studies] Vol. 8, No. 2 (February 2006).

³² For the relationship between the military and women and the history and process of the emergence of female soldiers, see Atsuko Fukuura, “*Shunjunsuru mo Tsuzukeru—Gunjisoshiki ni okeru Josei no Kyariyakeisei to Raifu Ibento* [Continue, with Trepidations: Career Development in Military Organizations for Women and Life Events],” Masakazu Tanaka ed., *Guntai no Bunkajinruigaku* [The Cultural Anthropology of the Military], (Tokyo: Fukyosha, 2015), pp.68-75.

³³ Department of Defense, “Diversity and Inclusion Strategic Plan 2012-2017,” [http://diversity.defense.gov/Portals/51/Documents/DoD_Diversity_Strategic_Plan_%20final_as%20of%2019%20Apr%2012\[1\].pdf](http://diversity.defense.gov/Portals/51/Documents/DoD_Diversity_Strategic_Plan_%20final_as%20of%2019%20Apr%2012[1].pdf) (accessed October 27, 2017).

all.³⁴ Started by U.S. businesses in the 1980s at a matter of their social responsibility, efforts in this regard were also aligned with the demographics of the labor force. According to the report published in 1987 by the Hudson Institute entitled *Workforce 2000*, the composition of the U.S. labor force was 47% white males, 36% white females, 5% non-white males, 5% non-white females, 4% male immigrants, and 3% female immigrants in 1985. However, the report estimated that the newly supplied workforce between 1985 and 2000 would consist of 15% white males, 42% white females, 7% non-white males, 13% non-white females, 13% male immigrants, and 9% female immigrants.³⁵ In other words, at the time that American society undertook diversity management, a high proportion of the new workforce entries consisted of immigrants and non-whites (42%, a figure that was only 17% in 1985), and nearly two-thirds were women (64%). However, in the military, the deployment of women, mainly in combat roles, was refrained from because of the gap in physical capacities and for the sake of the protection of motherhood. This restriction had been loosened over the years, but it was not until January 2013 that the policy to eliminate restrictions on assignment of female members of the military to combat duty was announced.³⁶

In Japan, in order to ratify the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), adopted at the 34th session of the General Assembly of the United Nations in December 1979, the Working Women Welfare Act (enacted in July 1972) was amended and the Act on Securing, Etc. of Equal Opportunity and Treatment between Men and Women in Employment, (Gender Equality in Employment Act) enacted in April 1985. Later, the Basic Act for Gender Equal Society was enacted in June 1999, making the government responsible for creating a gender equal society where men and women both can fully utilize their capabilities. Against this background of the times, the SDF workplace is gradually being opened to female personnel. However, compared to the United States and European countries, the ratio of female SDF personnel is still low (Table 1). On the other hand, there are views that the increase in the number of female SDF personnel from the high growth years (1965-74) to the bubble economy era (1985-1990) is the result of the difficulties in securing male SDF personnel.³⁷

There are several studies on the impact of the increase in the number of female members of the military on military traditions, and more broadly on society. Cynthia Enloe argues that the military is an organization built according to masculine values, and she is skeptical about opening its doors to female soldiers. Her reasoning for this is that women will lose their feminine values by working for the military.³⁸ In other words, Enloe expects women to play the social role of restraining the military, with its tradition of masculine culture and values, from becoming self-righteous. Since

³⁴ For changes in response to diversity management, see Mami Taniguchi, “*Soshiki ni okeru Daibaashitii Maneejimento* [Diversity Management in Organizations],” *Nihon Roudou Kenkyuu Zasshi* [The Japanese Journal of Labor Studies] No.574 (May 2008), pp.69-84.

³⁵ William B. Johnston ed., *Workforce 2000: Work and Workers for the Twenty-first Century* (Indianapolis: Hudson Institute, 1987), xxi.

³⁶ U.S. Defense Department website, <http://archive.defense.gov/news/newsarticle.aspx?id=119098> (accessed October 27, 2017).

³⁷ Fumika Sato, “*Gunjisoshiki to Jendaa yori* [From Military Organizations and Gender], Masako Amano et al ed., *Sei Yakuwari* [Gender Roles] (Shinpen Nihon no Feminizumu 3 (Feminism in Japan, New Edition, Vol.3)), (Tokyo: Iwanami Shoten, 2009), p.283.

³⁸ Cynthia Enloe (trans., Fumika Sato, supervised by Chizuo Ueno), *Sakuryaku—Josei wo Gunjikasuru Kokusaisenryaku* [Conspiracy: International Strategy that Militarizes Women], (Tokyo: Iwanami Shoten, 2006), pp.133-137.

the culture and values of the military are so powerful, an increase in the number of female military personnel will not change its culture and values; instead, the female military personnel will wind up losing the culture and values that are inherent to women (and are in opposition to those of men). She expresses the concern that society itself could end up losing the restraining function (feminine culture and values) on the self-righteousness of the military (masculine culture and values).³⁹ Martin van Creveld argues on the basis of the asymmetry between men and women that the latter do not have the aptitude for military service, since in addition to the anatomical nature of women, the culture of war has been masculine throughout human history.⁴⁰ He goes on to argue like Enloe that the military has a tradition of masculine culture and values, but has lost that tradition due to the increase in the number of female soldiers.⁴¹ He claims that the air force in particular used to have a masculine and ferocious institutional culture, but came to lose it in the 1980s due to the enlistment of female military personnel, in addition to nuclear proliferation.⁴² According to Creveld, men had created the culture of the military and war through their consciousness of women, and the increase in the number of female soldiers, who are less fit for the military in physical terms, diluted this tradition.⁴³ The issue of growing numbers of female military personnel should not only be seen from the perspective of covering the deficit in numbers. Instead, a careful debate is required whether or not the military tradition of masculine culture and values changes as the result of the increase in the number of female soldiers and whether that is desirable from a social perspective, while taking into account the perspective of diversity management.

Table 1 Proportion of Women among Military Personnel in Major Countries

	2001	2013
U.S.	14.0%	18.0%
Canada	11.4%	14.1%
U.K.	8.1%	9.7%
Germany	2.8%	10.1%
France	8.5%	13.5%
Italy	0.1%	4.0%
Spain	5.8%	12.4%
Netherland	8.0%	9.0%
Belgium	7.6%	7.6%
Norway	3.2%	9.7%
Japan	4.2%	5.6%

Source: Created from Anita Schjolset, "NATO and the Women: Exploring the Gender Gap in the Armed Forces," *PRIO Paper* (July 2010), p.28; The NATO Science for Peace and Security Programme, "UNSCR 1325 Reload," (June 2015), p.26; Asagumo Shimbunsha Inc., *Defense Handbook*, annual versions.

³⁹ Ibid., pp.145-170.

⁴⁰ Martin van Creveld, *The Culture of War* (Stroud: Spellmount, 2009), pp.395-409.

⁴¹ Martin van Creveld, *The Transformation of War* (New York: Free Press, 1991), p.179.

⁴² Martin van Creveld, *The Age of Airpower* (New York: PublicAffairs, 2011), pp.439-441.

⁴³ For Creveld's views on women and war culture, see also Tomoyuki Ishizu, *Daisenryaku no Tetsujintachi* [Philosophers of Great Strategies], (Tokyo: Nikkei Inc., 2013) pp.249-250.

(3) Capital Intensification of the Military

When the military is considered as a production function for services providing security, the production factors consist of labor (troops) and capital (equipment), and there is a substitution relationship between the two. In addition, when enough troops cannot be secured, there is no choice but to make up for this with equipment in greater quantity and/or quality in order to maintain the production of services—in other words, a shift from a manpower-intensive military to what Nichiporuk and Paul Poast call a capital-intensive military.⁴⁴ As introduced in section 1, Nichiporuk argued for introduction of a capital-intensive military in developed countries. So, what is the current situation? Here below, we will first take a look at NATO member countries, which face the same issue as Japan of low birth rates and aging societies. In the considerations of this section, we introduce the concept of “capital intensity of defense expenditures,” which is obtained by division of equipment-related expenditures in defense expenditures by personnel-related expenditures. By observing the long-term trend of this figure, we will be able to grasp a broader sense of whether the military is going in a capital-intensive direction, and what the speed with which it is moving in that direction is. Since the definitions of budget items in NATO member countries and Japan are different, a simple international comparison of the “capital intensity of defense expenditures” is meaningless. Instead, it is the trends within each country (rise and fall of capital intensity) that is of significance.

Since the end of the Cold War reduced the direct military threat on the European front, European countries have been going forward with defense reform that focuses on bolstering deployment capabilities and enhancing rapid response capabilities aimed at responding to international terrorism, proliferation of weapons of mass destruction and other new threats. The United Kingdom issued the *National Security Strategy and Strategic Defence and Security Review 2015 (NSS & SDSR 2015)* in November 2015 and positioned counterterrorism measures and cybersecurity as priority issues for national defense strategy, on par with threats of state origin.⁴⁵ Under the previous *SDSR (2010)*, the United Kingdom had promoted the reduction of troops and equipment and the conversion to a highly specialized and flexible, modern military force, but in the latest review decided to increase expenditures on equipment procurement and research and development. It plans to increase the number of troops including reserves slightly, but the civilian personnel in the Ministry of Defense will be cut by 30%.⁴⁶ According to its White Paper (*Defence and National Security, 2013*), published in July 2013, France will be downsizing its troops by 34,000 in light of fiscal constraints, and the amount of equipment will be reduced accordingly.⁴⁷ Germany enacted the revised Military Act, which prescribed the downsizing troops from 250,000 to 185,000. At the same time, it is aiming to build a structure capable of sustaining the deployment of a maximum of 10,000 troop members.⁴⁸ As for the United States, the *Quadrennial Defense Review 2014 (QDR2014)* included a downsizing of the Army (570,000 to 440/450,000 troop members) and the Marine Corps (182,000 to 175,000) in addition to the rebalancing to Asia.⁴⁹ The

⁴⁴ Paul Poast, *The Economics of War*, (New York: McGraw-Hill Irwin, 2006), p.91.

⁴⁵ *National Security Strategy and Strategic Defence and Security Review 2015*, pp.9-10.

⁴⁶ *Ibid.*, p.33.

⁴⁷ *French White Paper: Defence and National Security, 2013*, pp.89-93.

⁴⁸ The Ministry of Defense, *Defense of Japan 2015* (Tokyo: Nikkei Printing Inc., 2015), p.95.

⁴⁹ *Quadrennial Defense Review 2014*, pp.27-41.

National Guard (358,000 to 335,000) and the reserves (205,000 to 195,000) will also be reduced. However, it is indicated that the Air Force and Navy will maintain their current military power.

The major Western developed countries have been reducing their number of troops since the end of the Cold War (Figure 3), and this trend basically looks likely to be continued. The United Kingdom alone will be increasing its troops slightly, while slashing its civilian personnel. However, as Figure 4 shows, capital intensity presents a more complicated picture in each country. Near the end of the Cold War, capital intensity was declining in each country. This appears to have been a reaction to new procurement and replacement of equipment during the new Cold War era under the Reagan and Thatcher administrations in the United States and United Kingdom, respectively. After the Soviet Union collapsed in 1991, the capital intensity of defense expenditures rose in the United States and United Kingdom, but it continued to decline in Germany and Italy. The reason for this in Germany appears to be that new procurement of equipment was temporarily delayed by the post-1990 unified Germany because the former East German military had possessed large amounts of equipment. Meanwhile, in the United States and United Kingdom, the reduction in the number of troops accelerated after the collapse of the Soviet Union (Figure 3). As a result, personnel-related expenditures fell even more than before, and the capital intensity of defense expenditures rose as the result. A new trend since 2010, brief but continuing today, can be observed wherein an increase in the capital intensity of national defense expenditures is occurring among the European Countries (U.K., France, Germany, Italy). Since the number of troops has remained more or less constant during this period, this was caused by an increase in expenditures for equipment due to the more functionally sophisticated and more expensive equipment being procured. For example, the United Kingdom and Italy were procuring the Eurofighter Typhoon and engaged in the development of the F-35 fighter, and the United Kingdom is also constructing the expensive Queen Elizabeth class aircraft carriers and Stuart class submarines.

Meanwhile in Japan, while the number of SDF troops has been declining, capital intensity (sum of expenditures for equipment, etc. acquisition, research and development, facilities improvement, etc., and base measures divided by expenditures for personnel and provisions) has

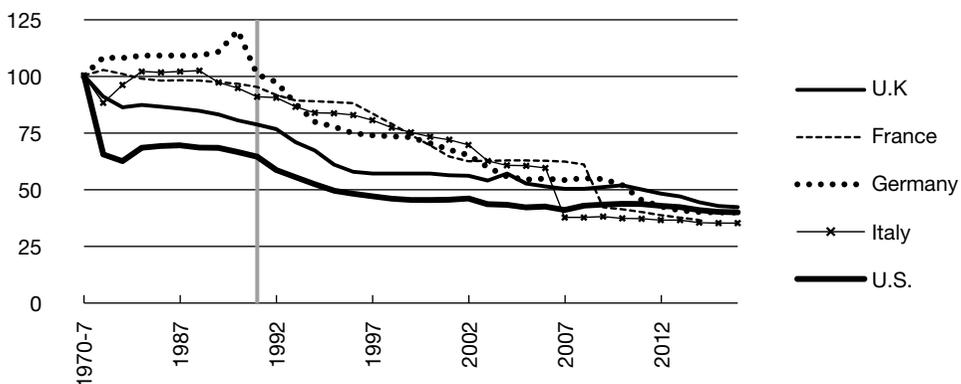


Figure 3 The Number of Troops in the Main NATO Member Countries (U.K., France, Germany, Italy, U.S.) (1970-2016)

Note: Number of troops in 1970 = 100. 2016 number is unavailable for France. The vertical axis in the figure represents 1991. Source: NATO website, http://www.nato.int/cps/en/natohq/topics_49198.htm (accessed on October 28, 2017).

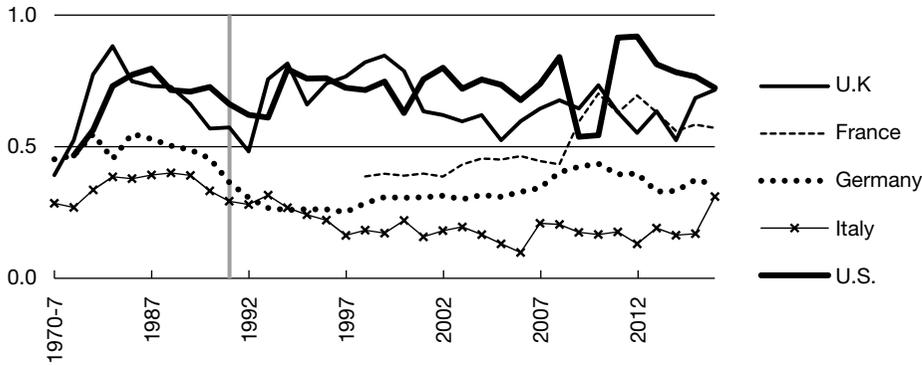


Figure 4 Capital Intensity in the Main NATO Member Countries (U.K., France, Germany, Italy, U.S.) (1970-2016)

Note: sum of equipment-related expenditures and facilities-related expenditures divided by personnel-related expenditures. The vertical axis in the figure represents 1991.

Source: Same as Figure 3.

been constantly falling since 1991 and up until most recently (Figure 5).⁵⁰ For example, even in 2007, when the number of SDF troops was significantly reduced, it was only by 11,000, or 4.6%, from 241,000 to 230,000. Thus, the impact of the reduction in the number of SDF troops on defense expenditures has been extremely limited compared to the United States. The capital intensity of Japan's defense expenditures did rise rapidly from FY 1978, the first year of procurement or building of the F-15, P-3C, and Hatsuyuki class destroyers (mass production of 12 vessels in five years), which would become the mainstay equipment of the Air and Maritime Self-Defense Forces.⁵¹ Moreover, Ronald Reagan became the president of the United States in 1981, so it was a time when Japan and the United States confronted the Soviet Union's military expansion. Figure 4 shows that the capital intensity of the U.S. national defense expenditures also went up during this period. This rising trend in capital intensity continued until 1991, when the economic bubble burst. After that, the capital intensity of defense expenditures entered a period of long term decline with the post-bubble recession and persistent low economic growth, and the intensity is still declining. During this period, the National Defense Program Guidelines was revised four times.⁵² In short, although the basic policy of the defense program has been revised several times, the long-term defense expenditures trend of declining capital intensity has remained unchanged. As we have seen, the trajectory of capital intensity in Japan's defense expenditures is relatively simple compared to those of the United States and Europe. As personnel-related expenditures proved rigid (there is less change in the number of SDF troops compared to the decline in the number

⁵⁰ The definition of fiscal expenditure items differs between NATO member countries and Japan. Because of this, a cross-country comparison of "capital intensity" is meaningless. Rather, it is important to compare trajectories (up/down and gradient).

⁵¹ However, the defense buildup would be based on the *Mid-Term Operations Estimate (MTOE)* from 1981 and the *Mid-Term Defense Program (MDTP)* from 1986.

⁵² *National Defense Program Guidelines for FY 1996 and Beyond (1995 Guidelines; November 28, 1995)*, *National Defense Program Guidelines for FY 2005 and Beyond (2004 Guidelines; December 10, 2004)*, *National Defense Program Guidelines for FY 2011 and Beyond (2010 Guidelines; December 17, 2010)*, *National Defense Program Guidelines for FY 2014 and Beyond (2013 Guidelines; December 17, 2010)*.

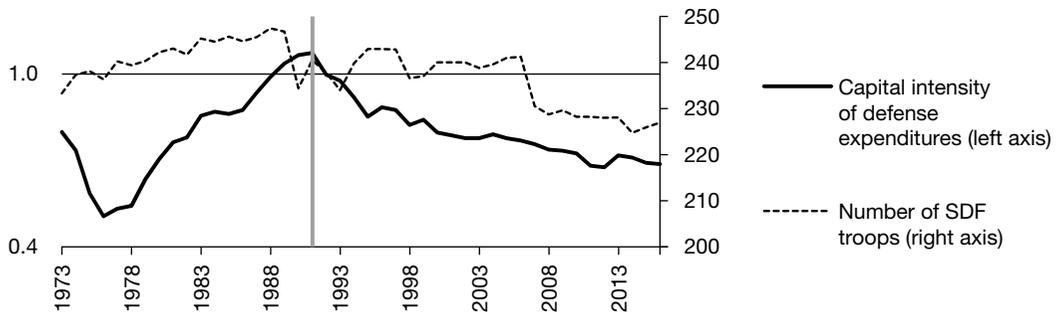


Figure 5 Capital Intensity of Japan's Defense Expenditures (solid line) and Number of SDF Personnel (dotted line) (1973-2016)

Note: The unit for the current number of SDF troops is 1,000. The vertical axis in the figure represents 1991.
 Source: Created from Asagumo Shimbunsha Inc., *Defense Handbook*, 1988, 1995, 2000, 2005, and 2016 versions.

of troops in the United States and Europe), the adjustments made necessary by the reduction of defense expenditures were made with equipment, etc. That appears to be how the capital intensity of Japan's defense expenditures wound up on a steadily declining slope. However, for the mid- and long-term orientation of capital intensity going forward, a debate that takes the circumstances of economic hegemony in the West Pacific into consideration is desired.

3. The Macro Issue: Historical Shift of Demographics and Economic Hegemony

The following is an overview of the relationship between demographics and security from the macro perspective of the shift in economic hegemony.⁵³ Since the beginning of history, demographics have had a significant impact on geopolitical international relations through economic hegemony. There was a period from the Renaissance through the Industrial Revolution to contemporary times in which population trends and economic power diverged; however, the two are beginning to converge again towards the 22nd Century. Add low birth rates and aging populations in developed countries and emerging economies to the mix, and it can be foreseen that the center of gravity for economic hegemony will shift from where it is now, in the Asia-Pacific region, in the direction of the Indian and Atlantic Oceans. This shift will occur over the course of the second half of the 21st Century to the 22nd Century.

(1) Demographics and Economic Hegemony

Population has been for much of human history the source of national power. Specifically, countries with large populations possessed correspondingly large economic power. The reason for this was that there was not much difference in production per worker under the socioeconomic conditions of the pre-Industrial Revolution world, which revolved around agriculture. Figures 6 and 7 show the total GDP and GDP per capita (both in purchase power parity conversion) of eight countries and regions (U.S., USSR/Russia, China, India, Japan, Western Europe, Latin America, and Africa) from 1 AD to 2100 AD. Figure 7 sets the average for Africa as 1.0 and gives the value for the

⁵³ For the discussions in this section, see also Keishi Ono, "Prospect of Demographic Trend, Economic Hegemony and Security: From the mid-21st to 22nd Century," *Briefing Memo* (May 2016).

others as its multiple. In 1 AD, per capita GDP was highest in the European countries due to the prosperity of Italy (the Roman Empire), but only 30% higher than the world average. During the Middle Ages, regional income differences narrowed, and Western Europe fell behind China and India in per capita GDP. Moreover, it was during this period when West Asia, which had built an Islamic empire upon Greco-Roman intellectual heritage, had the highest GDP per capita in the world, at approximately 1.5 times that of the Western European countries. The shares of heavily populated China and India were 25.4% and 32.0% in 1 AD, 22.7% and 27.8% in 1000 AD, and 24.9% and 24.4% in 1500 AD, respectively. In other words, China and India were the two largest economic powers in the world for most of the time since 1 AD.

This trend began to change during the Renaissance, from the end of the Middle Ages to beginning of the Modern Age, when the Western European countries began to surpass China and India in per capita GDP by wide margins.⁵⁴ At the center of the Renaissance and the most advanced among the Western European countries was Italy, where commerce, financing, woolen fabrics, and other handicraft manufacturing flourished. There, per capita GDP reached approximately twice the level of China and India, and three times the level of Pre-Colonial United States.⁵⁵ This situation greatly changed during the Industrial Revolution in the second half of the 18th Century, when European countries, which moved ahead in accumulating capital by pioneering in commerce, saw their national power rise dramatically.⁵⁶ The Industrial Revolution was truly worthy of the word “revolution” in terms of per capita GDP as well; national power had been completely freed from the shackles of demographics.⁵⁷ China and India, missing out on the Industrial Revolution, barely saw their per capita GDP budge between the 18th to the 20th centuries. During this same time period, GDP per capita soared first in Western Europe, and then in the United States. The shares of China and India in world GDP also began to decline during this time. In 1700, China and India each produced more than one-fifth of world GDP at 22.3% and 24.5% respectively. Although by 1820 China’s share had risen to 33.0%, India’s had fallen to 16.1%, dipping below one-fifth for the first time. By 1870, China had also dipped below one-fifth to 17.1%, and India even lower to 12.1%. Since the Mughal empire had ended in 1858 with the establishment of the British Raj, the Indian GDP in 1870 should be considered part of the British Empire. In 1870, the United Kingdom itself accounted for only 9.0% of world GDP, but adding India to it gave it 21.2%, an economic power greater than that of China.

Per capita GDP disparities grew over time. By 1913, the United States had a per capita GDP

⁵⁴ For the how the market economy developed and capital was accumulated in the Asian and European market economies in the early modern period, see Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000), Chapter 2.

⁵⁵ In the background here was an empirical rationalism, and the “rational ethos of the Italian Renaissance... enabled the reaping of enormous profits.” Yuji Aida, “*Itaria Runesansu* [Italian Renaissance],” Chikumashobo Editorial Department ed., *Sekai no Rekishi 9 Runesansu to Shuukyukaikaku* [World History 9: Renaissance and The Reformation] (Tokyo: Chikumashobo, 1979), p.40.

⁵⁶ “There was spectacular progress in mercantile states, which led to the recognition of a major revolution in manufacturing,” Henri Sée (trans., SoutaroTsuchiia, Shizuo Izumi), *Kindai Shihonhugi no Kigen* [Origins of Modern Capitalism], (Tokyo: Sogensha, 1945), p. 40.

⁵⁷ Shinichiro Naganuma raises the development of calculus, differential equations in particular, as one of the main reasons for the economic superiority of the Western European countries beginning in the 17th Century. Shinichiro Naganuma, *Keizaisuugaku no Tyokkannteki Houhou—Makuro-keizaigaku-hen* [Intuitive Method of Mathematics: for Economics: Macroeconomics Edition], (Tokyo: Kodansha Bluebacks, 2016), pp.18-40.

that was approximately 10 times (9.6 times, to be exact) that of China, while it moved ahead of even the British Empire (U.K. plus India) in terms of total GDP. Since then, until the end of the 20th Century, the United States would come to rule as the world's greatest economic power. The difference in per capita GDP between the United States and China rose to over 20 to one (21.8 to one, to be exact) by 1950, a state of affairs that continued until the First Oil Crisis in 1973 (at 19.9). However, the economic gap between the United States and China would shrink going forward, both in quality (per capita GDP) and quantity (total GDP). First, per capita GDP. Since 1998, India has had the lowest per capita GDP among the eight regions. However, the ratio between the figures for the United States and India fell from 15.7 in 1998 to 9.4 in 2015. This will drop to 6.0 in 2030, 4.0 in 2050, and 1.3 in 2100, according to one forecast.⁵⁸ This owes much to the globalization of economic activities. Capital liberalization has made it possible for developing countries to industrialize without capital constraints. As production technology spreads quickly through direct investments, the temporal superiority of the developed countries, who took the lead in technology development, is also crumbling. Moreover, the products that are being produced in this manner are being traded, narrowing the price gap between developed countries and developing countries for goods and services. Meanwhile, the concentration of the developing countries' population in urban areas helps enhance productivity.⁵⁹ It is believed that unlike other regions, Africa, particularly sub-Saharan Africa, will benefit from the "demographic dividend," under which its working population will grow.⁶⁰ As the result, the disparities in per capita GDP will continue to shrink throughout the 21st Century, making it likely that the world will enter an age where "population \approx economic and national power" for the first time since the middle ages. As for total GDP in terms of purchasing power parity, China had become the largest economic power in the world in 2015 at 16.6%, slightly higher than the United States at 15.9%. In 2050, India will become the second largest economic power at 13.5%, bumping the United States to third at 13.2%. While China will remain at the top of the world in 2050 at 19.5%, the figure will have dropped from 20.0% in 2030.

(2) Outlook on the Shift in the Gravity Center of the World Economy⁶¹

The figures in the preceding section use purchasing power parity, and so the figures for developed countries (United States, Western Europe, Japan) are undervalued compared to nominal ones. For example, the U.S. GDP for 2015 is lower than China's in terms of purchasing power parity, but U.S. GDP is 1.7 times that of China in the nominal terms published by the World Bank.⁶² Japan's GDP for the same year was one-fourth that of China's in terms of purchasing power parity, but is close

⁵⁸ Environment Policy Committee, OECD, "Long-term Economic Growth and Environment Pressure: Reference Scenarios for Global Projections," (September, 2012), pp.29-31.

⁵⁹ Tsukasa Ohbayashi, "Oinai Kuni Naijeria [Nigeria: The Country that Does Not Age]," *Nihon Keizai Shimbun*, (December 26, 2016, morning edition), p.7.

⁶⁰ International Monetary Fund, *Regional Economic Outlook: Sub-Saharan Africa*, Ch.2.

⁶¹ This part was first presented at the international seminar: "Crossroads Asia: Dynamics of Peace & Progress" hosted by the National Defense University, Pakistan that I made as "Globalization: An Economic Perspective; History and Prospect of Economic Hegemony," http://www.ndu.edu.pk/issra/post_seminar.php (accessed through the National Defense University, Pakistan's website on October 29,, 2017). I wish to take this opportunity to thank the participants of the session, who provided me with useful insights.

⁶² See the following for the World Bank's GDP statistics: World Bank website: (<http://databank.worldbank.org/data/download/GDP.pdf> and http://databank.worldbank.org/data/download/GDP_PPP.pdf) (accessed December 16, 2016.)

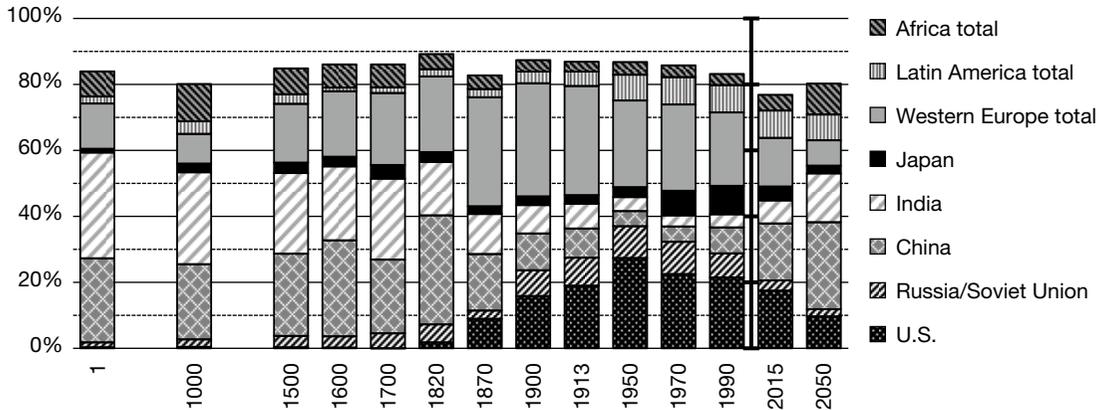


Figure 6 Composition of Global GDP (Purchasing Power Parity) (AD 1–2050)

Note: Values through 1998 calculated from the estimates of Angus Maddison, 2015 values from figures released by the World Bank, and 2050 values from the per capita GDP estimates of the Organisation for Economic Co-operation and Development (OECD) and the population forecasts of the Population Division, United Nations.
 Source: Calculated and compiled from the Maddison Project website < <http://www.ggdc.net/maddison/maddison-project/home.htm>, 2013 version> (accessed October 28, 2017); “Gross domestic product 2015, PPP,” World Bank website < http://databank.worldbank.org/data/download/GDP_PPP.pdf> (accessed December 16, 2016); and Population Division, United Nations, *World Population Prospects: The 2015 Revision* (New York: United Nations, 2015).

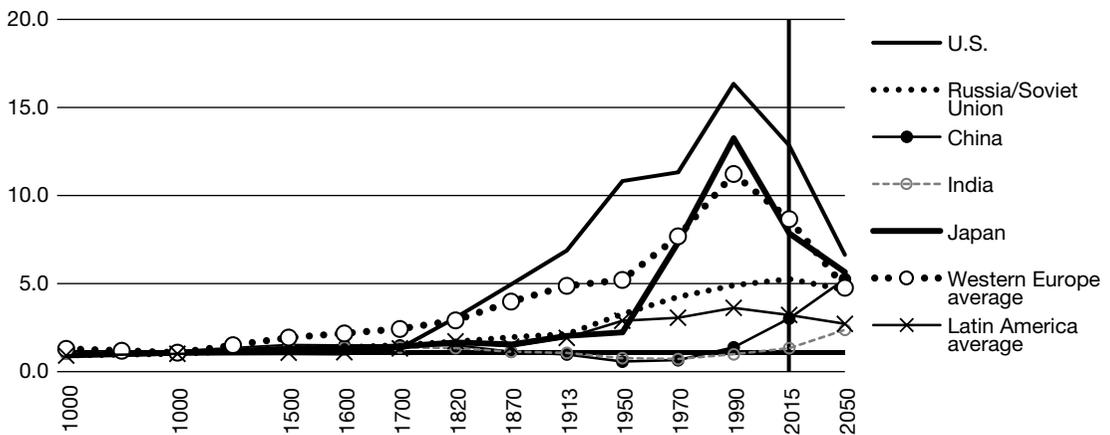


Figure 7 Ratio of per Capita GDP From AD 1 to 2050 AD (purchasing power parity; ratio for each country relative to the average for Africa = 1)

Source: Same as Figure 6.

to two-fifths in nominal terms. This means that the interpretation of the geopolitical significance of demographics and national and economic power varies depending on the choice between purchasing power parity and nominal. This interpretation is also determined by our understanding of the exchange rates used in calculating nominal figures. Exchange rates are determined by the exchange of the domestic and foreign currencies for trade and investment. Up to and including the Mercantilist era (up to and including the 17th Century roughly speaking), exchange rates were determined by trade in luxury goods and rare products, so the exchange rates per se were not appropriate as indices for calculating national and economic power. During this period, GDP

calculated in terms of purchasing power parity was appropriate as the measuring stick for national and economic power. However, since the Industrial Revolution, the amount of trade and investment came to be correlated with influence in the international community. Moreover, in the 19th and 20th Centuries, large amounts of arms, ammunition, and other military material were traded across borders, and even the money to purchase the material as well as for post-war reparations came to be borrowed.⁶³ At the same time, food and fuel came to be traded, essential not only for the military but also for civilian life and therefore deeply connected to the sustainability of war efforts. Under these circumstances, the national and economic power calculated according to exchange rates have great significance. However, as economic activities globalized, even low value-added goods that had been produced and consumed locally came to be traded, shrinking the gap in price levels between developed and developing countries. In other words, this means that the gap between GDP in terms of purchasing power parity and nominal GDP is going to be narrowed in the future.

Globalization of economic activities not only reduces the gap between GDP in terms of purchasing power parity and nominal GDP but also has the effect of reducing the gap between developed and developing countries in terms of their GDP per capita. With this in mind, we now look at the ultra-long-term shift in economic hegemony from the 21st Century to the 22nd (2100 AD), using demographics as a substitution variable. Table 2 shows world demographic estimates from the Population Division of United Nations for 2015 as well as forecast figures for 2050 and 2100. Of the 16 countries with the largest populations in 2015, seven border on the Pacific Ocean (Russia not included), five on the Indian Ocean (Ethiopia included, Indonesia double-counted), and four on the Atlantic Ocean (United States and Mexico double-counted). The weight of the Pacific region can be observed from the demographics. In the 2050 forecast, six each border on the Pacific and Indian Ocean and five border on the Atlantic Ocean. Of the 32 countries with the largest populations in 2100, seven will be in the Pacific region, ten in the Indian Ocean region, including Iraq, and eleven in the Atlantic region, including Mali. In short, the global center of gravity for population will shift from the Pacific rim to the Indian Ocean rim, and then later to the Atlantic rim.⁶⁴ At the same time, since international disparities in GDP per capita will become smaller, this shift in the center of gravity for populations will correlate closely with the shift in the one for economic activities. Table 3 shows the shift in the economic power of the three oceanic rims (Pacific, Atlantic, Indian) in the 21st Century. It is expected that the Pacific rim will account for over half of the world's total GDP until the middle of the century. After that, the Indian rim will have the largest economic power, and it is possible that the economic power of the Atlantic rim will be greater than that of the Pacific rim by 2100. This trend is expected to remain unchanged at the beginning of the 22nd Century. If this trajectory continues, the possibility cannot be denied that the Atlantic region will once again become the center of the world economy in the 23rd Century.

This is ultimately an ultra-long-term forecast. Note that since the calculation is made on the basis of an exponential of the population growth rate, a slight change in the population growth

⁶³ William N. Goetzmann and Andrey Ukhov, "China and the World Financial Markets 1870-1930: Modern Lessons From Historical Globalization," *Financial Institutions Center Working Paper* #01-30, University of Pennsylvania, (July, 2001), p.19; MICHIA MIYATA, "Rondon Tegatashijou no Kokusaika to Ingurand Ginkou [Internationalization of the London Promissory Market]," *Kanazawa Daigaku Keizaigakubu Ronshu* [Journal of Kanazawa University School of Economics], Vol.14 NO.2 (March 1994), p.61.

⁶⁴ For similar arguments, See International Monetary Fund, *Regional Economic Outlook: Sub-Saharan Africa*, Ch.2.

rate will alter the forecast figures dramatically. For example, the population forecast for Nigeria in 2100 by the Population Division, United Nations, was 303 million in its *World Population to 2300* published in 2004, but it was revised upward to 752 million in *World Population Prospects: The 2015 Revision*, by a factor of more than two.⁶⁵ Moreover, while the international disparities in income are reduced, Brian Keely points to the tendency for income disparities to widen within each country, which could become a new source of security concern.⁶⁶

Table 2 World Demographics (2015 estimate and 2050 and 2100 forecasts)

(Unit: million people)

2015 estimate		2050 forecast		2100 forecast			
China	1,376	India	1,705	India	1,660	Kenya	157
India	1,311	China	1,348	China	1,004	Mexico	148
U.S.	322	Nigeria	399	Nigeria	752	Angola	139
Indonesia	258	U.S.	389	U.S.	450	Mozambique	128
Brazil	208	Indonesia	322	Congo (DRC)	389	Sudan	127
Pakistan	189	Pakistan	310	Pakistan	364	Russia	117
Nigeria	182	Brazil	238	Indonesia	314	Madagascar	105
Bangladesh	161	Bangladesh	202	Tanzania	299	Viet Nam	105
Russia	143	Congo (DRC)	195	Ethiopia	243	Zambia	105
Mexico	127	Ethiopia	188	Niger	209	Cote D'Ivoire	101
Japan	127	Mexico	164	Uganda	203	Mali	93
Philippines	101	Egypt	151	Egypt	201	Turkey	88
Ethiopia	99	Philippines	148	Brazil	200	Malawi	87
Viet Nam	93	Tanzania	137	Bangladesh	170	Japan	83
Egypt	92	Russia	129	Philippines	169	Cameroon	82
Germany	81	Viet Nam	113	Iraq	164	U.K.	83
World total	7,349	World total	9,725			World total	11,213

Note: Hatching indicates countries bordering on the Atlantic Ocean (Congo (DRC), Mali, and Niger do not border on the Atlantic but are hatched because of their proximity. The Japanese population will be 52 million according to the median forecast by the National Institute of Population and Social Security Research (Tokyo).

Source: Created from Population Division, United Nations, *World Population Prospects: The 2015 Revision* (New York: United Nations, 2015).

**Table 3 Global GDP Shares Forecast (purchasing power parity)
of the Coastal Regions of Three Oceans**

	2015	2050	2100
Pacific Ocean	52.2%	51.9%	32.8%
Indian Ocean	22.1%	30.9%	43.4%
Atlantic Ocean	45.3%	31.9%	36.9%

Note: The "Atlantic" coastal region includes the Southern European and North African coastal regions in the Mediterranean. Countries bordering on multiple oceans are counted multiple times.

Source: Same as Figure 6.

⁶⁵ Population Division, United Nations, *World Population Prospects: The 2015 Revision* (New York: United Nations, 2015), p.24; Population Division, United Nations, *World Population to 2300* (New York: United Nations, 2004), p.42.

⁶⁶ Brian Keeley, "Income Inequality: The Gap between Rich and Poor," *OECD Insights*, Paris: OECD Publishing (2015) <http://dx.doi.org/10.1787/9789264246010-en> (accessed October 30, 2017).

(3) The State of Affairs in the West Pacific and U.S. Return to the Atlantic

Demographics have a significant impact on developed countries, not just Japan and developed countries in the West. It goes without saying that the Japan-U.S. alliance will also be greatly affected. Japan's national power will decline in the bottom half of the 21st Century and into the 22nd, as mentioned in the previous section (Figure 6). In the Asia-Pacific region, the national power of the United States will decline slightly in relative terms, and the national power of the members of the Association of Southeast Asian Nations (ASEAN) is expected to grow in line with their population growth. Meanwhile, in the Atlantic region, the national power of European NATO will decline relatively, while African and Latin American countries have plenty of room to increase their national power. It is necessary to take the "dynamics of national power" derived from demographics as the premise when discussing alliances.

This study takes the view that the relative national power of the United States will be maintained at current levels, although it will still be overwhelmingly large in comparison to the other developed countries. However, as the national power of the African and Latin American countries grows, there is the concern that the balance of military power in the Atlantic region may break down. One of the causes of the Falklands War in 1982 was as an attempt to divert public dissatisfaction over the economic difficulties that Argentina was going through.⁶⁷ However, the gap in national power between the United Kingdom and Argentina at the time was 3.1 to 1 in favor of the United Kingdom (in terms of GDP in purchasing power parity terms), and the conflict itself ended with a British victory within three months. However, this gap will narrow over the 21st Century to the 22nd.⁶⁸ Moreover, national power is growing more quickly in Brazil and Mexico than in Argentina, and the population and economy of African countries are expected to grow even more quickly. Like East Asia did during the Cold War, the two Atlantic coasts (Latin America and the African Continent) will be the engine of economic growth from the second half of the 21st Century to the 22nd Century (Table 3). As a result, the protection of economic interests in the Atlantic region will become important to the United States, and there will also be a new balance of power across the Atlantic. In this case, securing its dominance in the Atlantic region will become the most important security issue in light of its national interest for the United States. Although the United States bolstered its military power on the Pacific front through its "rebalancing strategy" at the beginning of the 21st Century, it will be faced with the need to also turn its relatively reduced military power towards the Atlantic front as the 22nd Century approaches. If the U.S. deployment of its military forces, currently oriented towards a focus on Asia through its "rebalancing strategy," reverts to the Atlantic from the late 21st to the 22nd Century, it will have a major impact on Japan's security policy.⁶⁹ In other words, if the United States, with its economic power relatively diminished, "orients itself towards the Atlantic," then Japan will be asked to play a larger role in securing stability in the West Pacific, despite having a smaller absolute economic power.

One option put forward for Japan and the United States is to take the lead in promoting

⁶⁷ Laurence Freedman, *The Official History of the Falklands Campaign* (London & New York: Routledge, 2005), p.93.

⁶⁸ IMF World Economic Outlook database, <https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/download.aspx> (accessed October 30, 2017); PricewaterhouseCoopers LLP, "The Long View: How will the global economic order change by 2050?" (February 2017).

⁶⁹ See the following for U.S. rebalancing policy. Michael Green, Kathleen Hicks and Mark Cancian eds., *Asia-Pacific Rebalance 2025: Capabilities, Presence and Partnerships* (Washington, DC: CSIS, 2016).

multilateral security cooperation in the Pacific region, with the Japan-U.S. alliance at the center. Japan and the United States will see their national power and the deployment of military power in the Pacific region decline, but the population and economic power of the ASEAN member countries will grow. Therefore, there will be a greater need than before for the Japan-U.S. alliance to explore strengthening coordination with these countries. Although the Philippines and Vietnam are in confrontation with China regarding territorial issues in the South China Sea, ASEAN members are not necessarily in lock step when it comes to their diplomatic posture towards China. Beyond the ASEAN member countries, Australia is a country with which Japan and the United States share values such as democracy, the market economy, and the rule of law. For example, Michael Auslin proposes a break from the Cold War hub-and-spokes security system with the United States at the center in order to secure common ownership and freedom in the global commons, cyberspace included, of the Indian-Pacific region and to stand up against the threat from China.⁷⁰ There, he argues for a joint response from Japan/South Korea, India, and Australia, allies forming a triangle as the security policy that the United States should adopt for the 21st Century. This argument includes the relative decline of U.S. power in its scope, although it does not envision the rise of African economic power. On the other hand, Joseph S. Nye, Jr. offers a strong rebuttal to the concern over the relative decline of U.S. national power in his book, *Is the American Century Over?*⁷¹ His argument there can be summarized as follows: the overwhelming superiority of the United States does not waver in the areas of “soft power (political value, moral authority and cultural attractiveness),” the “development and management of information technology (particularly the latter),” and the “provision of international public goods (diplomatic, security and international economic systems).” However, Nye himself does not deny that the economic power of the United States is in relative decline. Moreover, it also cannot be denied that the effectiveness of “soft power,” where Nye believes that the United States enjoys superiority, is significantly correlated with economic power.

Conclusion

Demographics impact security at both macro and micro levels. On the macro level is the need to construct defense capabilities under the premise of the “low birth rate and aging society” that developed countries, the United States excluded, and emerging economies face. In this regard, Japan and the European members of NATO are already beginning to go through a process of trial and error. Regarding the micro level impact, a difficult competition with the private sector over a youth population that will be in inevitable decline cannot be avoided going forward. The SDF had over 224,000 troops as of March 31, 2017 out of a working-age population (15-64 years old) of 76.20 million.⁷² But Japan’s working-age population is forecast to decline to 23.69 million and 20.25 million, or less than one-third, by 2100 and 2110 respectively. Will it be possible to maintain SDF personnel at close to the 220,000 there are now? It should be the case that Japan

⁷⁰ Michael Auslin, *Security in the Indo-Pacific Commons: Toward a Regional Strategy*, (Washington, D.C.: American Enterprise Institute, 2010).

⁷¹ Joseph S. Nye, Jr., *Is the American Century Over?* (Cambridge: Polity Press, 2015).

⁷² Ministry of Defense website at http://www.mod.go.jp/j/profile/mod_sdf/kousei/ (accessed on October 30, 2017); Ministry of Internal Affairs and Communications website at <http://www.e-stat.go.jp/SG1/estat/OtherListE.do?bid=000001007603&cycode=1> (accessed October 30, 2017).

will also see the SDF become more “capital intensive,” and the “capital intensity” of defense expenditures rise as the solution to this problem. In considering “capital intensification of the military,” it is also necessary to keep in mind the use of artificial intelligence (AI), which has been evolving rapidly in recent years, as an alternative to human labor. A famous study by Carl Benedikt Frey and Michael Osborne uses the example of the United States to indicate that 47% of the labor force may be replaced by AI over the next 20 years or so.⁷³ The study examines 702 kinds of occupations individually. They do not include military professions. However, they do include crisis management, police, firefighting, security guard, etc. The potential for replacement by AI for supervisory and managerial work in crisis management, police, and firefighting is a mere 0.3~0.4%.⁷⁴ At the same time, the potential for replacement for firefighters, police and firefighting dispatchers, and security guards is 17%, 49%, and 84% respectively. Nichiporuk and Poast do not delve that deeply into this issue, so the “capital intensification of the military” predicated on progress in AI is a matter for future debate.⁷⁵

The macro impact occurs as the result of changes in the security environment through the impact of demographics on economic power (\approx national power). What is most worrisome to Japan is the resurgence of the “rebalancing strategy” that forms the backbone of the current U.S defense policy. This is reminiscent of the geopolitical debate regarding the United States that Nicholas J. Spykman had envisioned in 1942 during World War II.⁷⁶ Looking at the security environment surrounding Japan, it has never been able to handle the macro impact by itself, and this is unlikely to change in the future. Thus, cooperation with neighboring countries with which it shares common political, economic, and social values is essential. However, there is no change in the central role of the Japan-U.S. alliance in Japan’s security and foreign policy since U.S. national power will remain large in the Asia-Pacific region, albeit diminished in relative terms. Robert D. Kaplan places the Indian Ocean and the African Continent, in addition to China, at the center of his analysis of the future geopolitical strategic environment.⁷⁷ Given the demographic and hegemonic trends that Kaplan does not go deeply into, it is certain that the relative weight of the Indian Ocean coastal regions and the Atlantic region will rise over the mid- to long-term.⁷⁸ Per capita GDP will converge as a consequence of the globalization of economic activities, while the Asia-Pacific region will decline and the Indian Ocean region and later the Atlantic region, mainly

⁷³ Carl Benedikt Frey and Michael Osborne, “The Future of Employment: How susceptible are jobs to computerisation?,” *Working Paper*, Oxford Martin School, University of Oxford (Sep. 2013), p.48.

⁷⁴ *Ibid.*, pp.61-77.

⁷⁵ Masakazu Kobayashi also touches on the introduction of AI. However, he only mentions robotic weapons (high-performance autonomous weapons) and does not discuss the issue from the perspective of “AI replacing labor in the military.” Masakazu Kobayashi, *AI no Shogeki—Jinkou chinou ha Jinrui no Teki ka?* [The AI Shock: Is Artificial Intelligence the Enemy of Humankind?], (Tokyo: Kodansha Gendai Shinsho, 2015), pp.39-43.

⁷⁶ However, Spykman also did not foresee the relative decline of U.S. national power and the rise of the national power of India and Africa. Nicholas J. Spykman (trans., Kota Watanabe), *Supaikuman Chiseigaku—Sekai Seiji to Amerika no Senryaku* [Spykman’s Geopolitics: Global Politics and U.S Strategy], (Tokyo: Fuyo Shobo Shuppan, 2017).

⁷⁷ Robert d. Kaplan (trans., Shinji Okuyama, Mitsuhiro Sekine), *Indoyou-ken ga Sekai wo Ugokasu Monsoon ga Musubu Yakushinkokka-gun ha Doko he Mukaunoka* [Monsoon: The Indian Ocean and the Future of American Power], (Tokyo: Intershift, 2012).

⁷⁸ Kaplan refers to external economic relations (trade and investment) as an economic issue but has little to say about economic scale (GDP).

Africa and South America, will rise. As a result, the weight of the Atlantic region in the world economy will inevitably rise, and the Atlantic region will grow in importance to the U.S. national interest in economic terms relative to the Asia-Pacific region. It is unclear whether the United States will have sufficient economic power to watch over both the Pacific and the Atlantic, but it is obvious that its national power will have declined in relative terms. What kind of policies will the United States choose then, and what should Japan's defense program and security policy be like under low birth rates and a declining population under those circumstances? That is a debate that cannot be avoided going forward.

