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**JAPAN'S DEMOGRAPHIC TRENDS AND THEIR
IMPACT ON THE SELF-DEFENSE FORCES**

by

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March 2020

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**JAPAN'S DEMOGRAPHIC TRENDS AND THEIR IMPACT ON THE
SELF-DEFENSE FORCES**

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ABSTRACT

According to conventional wisdom, a country's population affects its ability to staff and fund its military. Japan analysts agree, making the case that Japan's current demographic situation should be constraining manpower and funding in its military—the Self-Defense Forces (SDF). However, Japan has maintained both manning and expenditure levels for the SDF, despite its aging and declining population. Does the conventional wisdom not apply to Japan? If not, why? How has Japan maintained its military manpower and funding despite deteriorating demographic trends? Ultimately, the purpose of this research is to assess the prevailing opinion of Japan based on data gathered from academic and government sources. The first half of this research examines whether population decline has a negative impact on military manpower (i.e., poses a direct constraint), while the second half examines whether population decline has a negative impact on military funding (i.e., poses an indirect constraint). This thesis finds that Japan has successfully maintained both manning and expenditure levels for the SDF by (1) manipulating certain recruitment policies and (2) increasing its deficit spending.

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LIST OF ACRONYMS AND ABBREVIATIONS

ASDF	Air Self-Defense Force
GDP	Gross Domestic Product
GSDF	Ground Self-Defense Force
JSDF	Japan Self-Defense Forces
MOD	Ministry of Defense
MSDF	Maritime Self-Defense Force
MTDP	Medium Term Defense Program
NDPG	National Defense Program Guidelines
OECD	Organisation for Economic Co-operation and Development
SACO	Special Action Committee on Okinawa
SDF	Self-Defense Forces
TFR	Total Fertility Rate

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I. INTRODUCTION

A. MAJOR RESEARCH QUESTION

According to popular conventional wisdom, a country's population size affects its ability to staff and fund its military. Japan analysts agree, making the case that Japan's current demographic situation should be constraining its military—the Self-Defense Forces (SDF)—manpower and funding. However, Japan has maintained both SDF manning and expenditure levels despite its aging and declining population. This situation raises the following question: Does the conventional wisdom not apply to Japan? If not, why? Therefore, the major research question of this thesis is: Has Japan maintained its military manpower and funding despite deteriorating demographic trends? If so, how? To be clear, the major research question is straightforward and does not address an “all else equal” scenario. That is, this thesis will examine whether population decline has coincided with a reduction in military manpower and funding (as many arguments imply or expect) but not the more subtle question of whether population decline has made military manpower and funding less than it would have been otherwise. Ultimately, the purpose of this research is to assess the prevailing opinion of Japan based on data gathered from both academic and government sources.

B. SIGNIFICANCE OF THE RESEARCH QUESTION

The research question is significant for two reasons. On the one hand, great powers such as China and Russia are experiencing population aging and decline—these demographic trends are a global phenomenon. Jackson and Howe state that “[i]t is possible that when the [demographic] transition has run its course, the global security environment that emerges will be safer than today's.”¹ Sheen echoes similar concerns by arguing that

[...]he rapidly aging populations of Northeast Asia will create more demand for social security rather than military security. The emphasis on social security will force each government to limit, if not cut, ambitious military projects and ultimately will provide a powerful incentive to seek a

¹ Richard Jackson and Neil Howe, *The Graying of the Great Powers: Demography and Geopolitics in the 21st Century* (Washington, DC: CSIS, 2008), 137.

more cooperative mechanism to offset the security gap created by defense budget cuts.²

In other words, as great powers continue to gray and shrink, they might become too old, small, or poor to participate in great power competition. Sheen and Haas call this outcome “demographic peace”³ and “geriatric peace,”⁴ respectively. Simultaneously, this global phenomenon also reinforces U.S. global hegemony: the U.S. is experiencing population aging and decline but to a lesser extent due to very high immigration.⁵ Ultimately, it might have positive implications not only for great power competition, but also for Japan itself, due to the potentially peaceful outcome.

On the other hand, this global phenomenon might have negative implications for Japan’s international security commitments. Haas states that “when the United States engages in major international undertakings in the future, the other major actors in the system will be able to offer less help than they can today.”⁶ Since its establishment in 1954, the SDF has expanded its mission sets into non-traditional areas such as United Nations peacekeeping, counter-terrorism, anti-piracy, and humanitarian assistance/disaster relief operations. However, Libicki, Shatz, and Taylor stress that “[m]ilitary operations other than war tend to be very manpower-intensive.”⁷ In other words, as Japan continues to gray and shrink, it might become too old, small, or poor for its international security commitments, forcing the U.S. to assume a greater share of this burden.⁸ Simultaneously, this global phenomenon also reinforces Japan’s U.S. security dependence. Ultimately, it

² Seongho Sheen, “Northeast Asia’s Aging Population and Regional Security: ‘Demographic Peace?’,” *Asian Survey* 53, no. 2 (April 2013): 294.

³ Sheen.

⁴ Mark L. Haas, “A Geriatric Peace? The Future of U.S. Power in World of Aging Populations,” *International Security* 32, no. 1 (Summer 2007): 114.

⁵ Haas, 113.

⁶ Haas, 114.

⁷ Martin C. Libicki, Howard J. Shatz, and Julie E. Taylor, *Global Demographic Change and Its Implications for Military Power* (Santa Monica, CA: RAND Corporation, 2011), 106.

⁸ Francis P. Sempa, “Population in the Study of Geopolitics,” in *Population Decline and the Remaking of Great Power Politics* (Washington, DC: Potomac Books, 2012), 74.

might have negative implications not only for Japan's international security commitments but also for its ability to defend itself.

Although this research is designed to add to the existing literature on Japan's demographic trends and their impact on the SDF, its findings could also be useful as a model (though perhaps not a fully applicable one in all countries) for how countries might maintain their military staffing and spending as their populations' age and decline. After all, Japan is one of the frontrunners in this global phenomenon. What important observations, insights, and lessons can the Japanese experience provide for other developing and developed countries?

C. LITERATURE REVIEW

Many scholars have written on Japan's population aging and decline. Accordingly, much literature is available on these demographic trends' underlying causes and implications for social security spending and economic growth. Much literature is also available on the military implications of these demographic trends for countries other than Japan. However, there is little English-language literature that has specifically analyzed Japan's demographic trends and their impact on the SDF, especially with regard to the present day, as opposed to future projections. This research seeks to fill this important knowledge gap.

The literature review is divided into two sections. The first section examines the existing literature on the popular conventional wisdom that a country's population size affects its ability to staff and fund its military. Specifically, this section explores both the direct constraints of population on military manpower and the indirect constraints on military funding. The second section examines the smaller existing literature on Japan's demographic trends and their impact on the SDF.

1. Direct Population Constraints on Military Manpower

According to Ono, "the future reduction of the military in 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.”⁹ The first concern with this global phenomenon is straightforward: whether population decline has a negative impact on military manpower (i.e., poses a direct constraint). This idea is best summarized by Yoshihara, who explains that these demographic trends inevitably lead to a “gradual decrease in eligible manpower that can be recruited and fielded for combat.”¹⁰ The impact of population decline on military manpower could be illustrated as follows: (1) as population size decreases, so too will (2) recruitment pool size; as a result, (3) military manpower decreases (Figure 1).

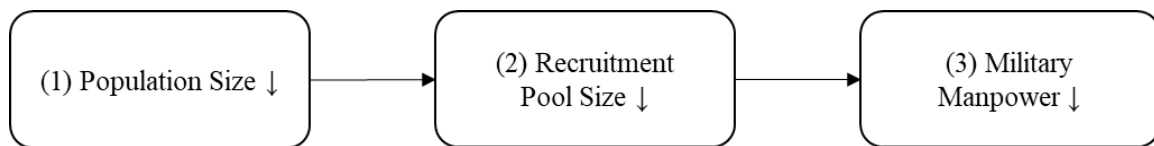


Figure 1. The Impact of Population Decline on Military Manpower

2. Indirect Constraints on Military Funding

The second concern with this global phenomenon is whether population decline has a negative impact on military funding, relatively as well as absolutely (i.e., poses an indirect constraint). This idea is best summarized by Sciubba, who explains that “[w]hether states have the ability to fund their militaries is an economic concern; whether states have the will to fund their militaries is a political concern.”¹¹ In other words, the indirect constraints on military funding depend on two factors: (1) the crowding-out effect and (2) slow economic growth.

⁹ Keishi Ono, “Demographics and Security: Defense Capabilities Building and Economic Hegemony towards the 22nd Century,” *NIDS Journal of Defense and Security*, no. 18 (December 2017): 40–42.

¹⁰ Toshi Yoshihara, “The Setting Sun? Strategic Implications of Japan’s Demographic Transition,” in *Population Decline and the Remaking of Great Power Politics* (Washington, DC: Potomac Books, 2012), 143.

¹¹ Jennifer Dabbs Sciubba, *The Future Faces of War: Population and National Security* (Santa Barbara, CA: Praeger, 2011), 54.

The first problem is that military funding is vulnerable to the crowding-out effect, in which social security spending supersedes defense spending. Furthermore, the severity of the crowding-out effect depends on the size of the old-age group (aged 65 and older). As the old-age group expands, so, too, will social security spending, ultimately crowding out defense spending. Simply put, social security spending and defense spending may have an inverse relationship.

The second problem is that military funding is vulnerable to slow economic growth, which might, in turn, depend on the size and productivity of the working-age group (aged 15 to 64). As the working-age group shrinks, so, too, will the gross domestic product (GDP), ultimately slowing economic growth (unless productivity increases to levels that compensate for the shortage of workers). Tsunoda and Glosserman state that “[f]unding the military is always difficult; it will be tougher in a grayer society that has rising demands upon a shrinking pool of tax revenues.”¹² The impact of population decline on military funding could be illustrated as follows: (1) as population size decreases, (2a) the crowding-out effect increases and/or (2b) economic growth decreases; as a result, (3) military funding decreases, relatively as well as absolutely (Figure 2).

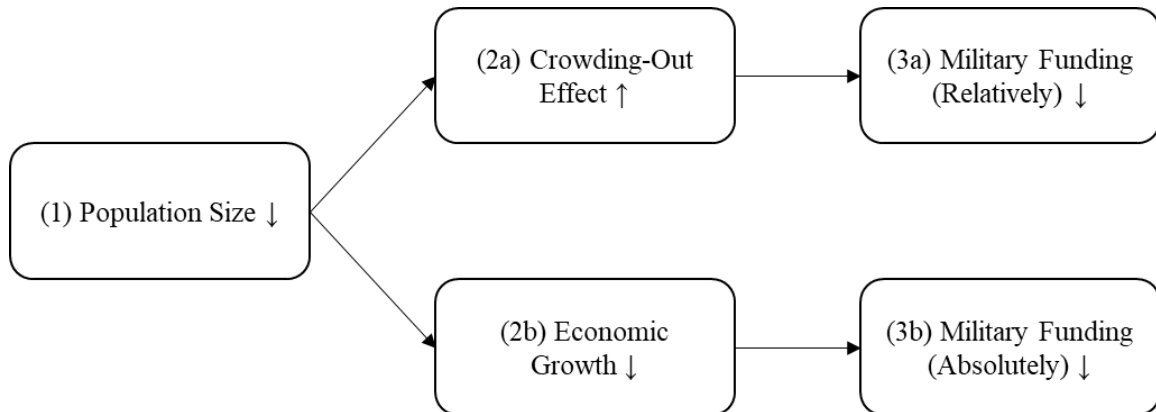


Figure 2. The Impact of Population Decline on Military Funding

¹² Tomoko Tsunoda and Brad Glosserman, “The Guillotine: Japan’s Demographic Transformation and Its Security Implications,” *Issues and Insights* 9, no. 10 (June 2009): vii.

To further exacerbate the situation, Ono states that developed countries “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.”¹³ Haas echoes similar concerns by arguing that “[i]f current trends continue, some of the great powers of today ... will not be the great powers of the future.”¹⁴

However, the crowding-out effect and slow economic growth are not the only concerns with population aging and decline. Haas states that these demographic trends are “likely to push militaries to spend more on personnel and less on other areas, including weapons development and procurement.”¹⁵ Nichiporuk adds that

[...w]ith fewer soldiers available, the levels of training and experience in the force will become critical to battlefield performance. The value of each individual soldier, sailor, and airman to these militaries will increase as long as national youth cohorts remain relatively small.¹⁶

In other words, both Haas and Nichiporuk point out that these demographic trends increase personnel expenses and decrease material expenses. This happens for three reasons: (1) competition with the private sector increases personnel salaries, (2) population aging of the militaries themselves increases personnel pensions, and (3) population decline increases training and exercises. Brooks, Brooks, Greenhill, and Haas call this outcome “high per unit soldier cost.”¹⁷

¹³ Keishi Ono, “Demographics and Security: Defense Capabilities Building and Economic Hegemony towards the 22nd Century,” *NIDS Journal of Defense and Security*, no. 18 (December 2017): 34.

¹⁴ Mark L. Haas, “America’s Golden Years?: U.S. Security in an Aging World,” in *Political Demography: How Population Changes Are Reshaping International Security and National Politics* (New York, NY: Oxford University Press, 2012), 50.

¹⁵ Mark L. Haas, “A Geriatric Peace? The Future of U.S. Power in World of Aging Populations,” *International Security* 32, no. 1 (Summer 2007): 140.

¹⁶ Brian Nichiporuk, *The Security Dynamics of Demographic Factors* (Santa Monica, CA: RAND Corporation, 2000), 28.

¹⁷ Deborah Jordan Brooks et al., “The Demographic Transition Theory of War: Why Young Societies Are Conflict Prone and Old Societies Are the Most Peaceful,” *International Security* 43, no. 3 (Winter 2018): 70.

3. Japan's Demographic Trends and Their Impact on the SDF

Japan's Ministry of Defense (MOD) began noticing the military implications of these demographic trends at the beginning of the 21st century. The 2004 National Defense Program Guidelines (NDPG) was one of the first government sources that mentioned Japan's demographic trends and their impact on the SDF. The 2004 NDPG addressed Japan's demographic concern as follows:

In developing Japan's defense forces, we have to take into account the fact that while the roles that our defense forces have to play are multiplying, the number of young people in Japan is declining as a result of the low birth rate, and fiscal conditions continue to deteriorate.¹⁸

By the following year, the *Defense of Japan 2005* added that:

The SDF, nevertheless, anticipates that recruitment will become much more difficult in the medium to long term, with the population of males between the ages of 18 and 26 eligible to become Private (Ground Self-Defense Force), Seaman Apprentice (Maritime Self-Defense Force), or Airman 3rd Class (Air Self-Defense Force) in the Short-Term Service falling from a peak of about 9.0 million in 1994, and more students going on to higher education after high school.¹⁹

Both the NDPGs and the annual white papers (*Defense of Japan*) continued to address similar concerns for the following decade. However, Japan's demographic trends continued to deteriorate. Consequently, the *Defense of Japan 2017* stated that "due to the recent economic and employment upturn, as well as the advancement of declining birthrate and popularization of higher education, the environment surrounding the recruitment of uniformed SDF personnel is severe."²⁰ By the following year, the 2018 NDPG addressed Japan's demographic concern as follows:

Securing human resources for SDF personnel and improving their ability and morale are essential to strengthening defense capability. This has

¹⁸ Ministry of Defense, *National Defense Program Guidelines, FY 2005-* (Tokyo: Japan Ministry of Defense, 2004), https://www.mod.go.jp/e/d_act/d_policy/national.html.

¹⁹ Ministry of Defense, *Defense of Japan 2005* (Tokyo: Japan Ministry of Defense, 2005), https://www.mod.go.jp/e/publ/w_paper/2005.html.

²⁰ Ministry of Defense, *Defense of Japan 2017* (Tokyo: Japan Ministry of Defense, 2017), https://www.mod.go.jp/e/publ/w_paper/2017.html.

become an imminent challenge in the face of shrinking and aging population with declining birth rates.²¹

Accordingly, the 2018 Medium Term Defense Program (MTDP) addressed Japan's demographic concern with the following plan:

In order to steadily secure high-quality human resources into the future within the severe recruiting environment accompanying the rapidly aging population and declining birth rates, MOD/SDF will proceed with measures towards expanding the recruitment of untenured troops and expanding the sources for prospects including university graduates.²²

In other words, the MOD has been fully aware of Japan's demographic trends and their impact on the SDF over the past two decades.

In addition to government materials, there are academic materials that directly deal with Japan's demographic trends and their impact on the SDF. To be clear, this limited literature specifically analyzes the *future* military implications of Japan's demographic trends. The most prominent works are by Eldridge, Tsunoda and Glosserman, and Yoshihara, all positing that Japan's demographic trends will more than likely constrain its military manpower and funding in the near future.

Eldridge, in "Japan's Changing Demographics and the Impact on Its Military"²³ and *Declining Population and the SDF*,²⁴ discusses Japan's demographic trends and their impact on the SDF. He argues that Japan's current demographic situation "will not only have a grave impact on the Japanese economy domestically and its status internationally, but will also greatly affect the ability of the government of Japan to maintain the personnel

²¹ Ministry of Defense, *National Defense Program Guidelines for FY 2019 and Beyond* (Tokyo: Japan Ministry of Defense, 2018), https://www.mod.go.jp/e/d_act/d_policy/national.html.

²² Ministry of Defense, *Medium Term Defense Program (FY 2019 - FY 2023)* (Tokyo: Japan Ministry of Defense, 2018), https://www.mod.go.jp/e/d_act/d_policy/national.html.

²³ Robert D. Eldridge, "Japan's Changing Demographics and the Impact on its Military," *Education About Asia* 22, no. 3 (Winter 2017).

²⁴ Robert D. Eldridge, *人口減少と自衛隊 [Declining Population and the SDF]* (Tokyo: Ikuhisha, 2019).

requirements for its military, the highly advanced but untested Japan Self-Defense Force (SDF).”²⁵ Furthermore, Eldridge recommends a number of measures for Japan to implement in order to overcome these eventual demographic constraints:

1. Increase the SDF’s active and reserve personnel salary
2. Increase the SDF’s active and reserve personnel retirement age
3. Decrease the SDF’s recruitment standards
4. Increase the SDF’s number of reserve personnel
5. Increase the SDF’s number of female personnel
6. Decrease Japan’s overseas commitments
7. Increase Japan’s U.S. security dependence
8. Establish formal alliances with other developing and developed countries
9. Establish a minimum nuclear deterrent force
10. Implement compulsory military service
11. Employ mercenaries
12. Restructure the SDF into regional joint commands
13. Combine the SDF into joint commands with existing U.S. military bases in Japan
14. Better employ the SDF’s active and reserve personnel
15. Increase capital intensity to compensate for military manpower²⁶

²⁵ Robert D. Eldridge, “Japan’s Changing Demographics and the Impact on its Military,” *Education About Asia* 22, no. 3 (Winter 2017): 27.

²⁶ Eldridge, 29–30.

However, the measures he recommends are not silver bullets. Eldridge states that “each [measure] comes with weighty trade-offs, either fiscal or otherwise.”²⁷ Ultimately, he concludes that “several of the above options are unthinkable in today’s terms when considering present-day Japan and its SDF, but if the demographics change substantially in the future, as current trajectories suggest, all options might have to be on the table.”²⁸

Unlike Eldridge, Tsunoda and Glosserman, examine more than just the SDF.²⁹ They argue that population aging and decline might have positive implications for Japan itself: a greener society, ending a historical legacy, and setting an example for the world (to be clear, although these positive implications are important in themselves, they are not the primary concern of this thesis).³⁰ Furthermore, Tsunoda and Glosserman recommend a handful of measures (very similar to Eldridge’s) for Japan to implement in order to overcome these eventual demographic constraints. Ultimately, they conclude that

Japan is aging and its population [is] shrinking. The demographic transition that has begun will have profound implications on Japanese society and its international profile. Current trends can be changed, but the longer that action is delayed, the less likely a reversal becomes. The current political turmoil does not bode well for a change of course.³¹

Yoshihara, like Tsunoda and Glosserman, examines more than just the SDF.³² His study “aims to (1) highlight the demographic challenge to Japan’s basic defense requirements; (2) posit two scenarios on how population decline could impact Tokyo’s strategic position; and (3) explore the broader strategic implications of demography for

²⁷ Robert D. Eldridge, “Japan’s Changing Demographics and the Impact on its Military,” *Education About Asia* 22, no. 3 (Winter 2017): 29.

²⁸ Eldridge, 30.

²⁹ Tomoko Tsunoda and Brad Glosserman, “The Guillotine: Japan’s Demographic Transformation and Its Security Implications,” *Issues and Insights* 9, no. 10 (June 2009).

³⁰ Tsunoda and Glosserman, 26–27.

³¹ Tsunoda and Glosserman, 42.

³² Toshi Yoshihara, “The Setting Sun? Strategic Implications of Japan’s Demographic Transition,” in *Population Decline and the Remaking of Great Power Politics* (Washington, DC: Potomac Books, 2012).

Japan, the United States, and regional/global security.”³³ Furthermore, Yoshihara points out several strategic implications of Japan’s demographic trends. He asserts that there are inconsistencies between Japan’s policies, strategies, and resources. For example, Yoshihara states that given Japan’s current demographic situation, “it is exceedingly doubtful whether the SDF could cope with multiple, simultaneous, or near-simultaneous contingencies, prosecuting some combination of conventional and stability operations.”³⁴ He further adds that “Tokyo’s pledges to do more on the international stage and the potential inability to fulfill those promises could have dire consequences for the U.S.-Japan alliance.”³⁵ Ultimately, Yoshihara concludes that “[t]he population crisis for Japan is undoubtedly approaching, and this crunch will be accompanied by unprecedented strategic pressures.”³⁶

These are the most central and current English-language works on the topic. Although Eldridge, Tsunoda and Glosserman, and Yoshihara acknowledge Japan’s current demographic situation, they specifically analyze the *future* military implications of Japan’s demographic trends. All three works posit that Japan’s demographic trends will more than likely constrain its military manpower and funding in the near future. This implies by omission, though, that Japan’s demographic trends have not constrained its military manpower and funding *thus far*. These authors fail to explain how Japan has maintained SDF manning and/or expenditure levels despite the fact that its population is *already* aging and declining. This research seeks to fill this important knowledge gap.

D. THESIS OVERVIEW

This thesis is divided into five chapters. As the foundation of the research, Chapter II explores the demographic transition theory to understand how Japan’s current demographic situation came to be. This chapter analyzes Japan’s demographic transition

³³ Toshi Yoshihara, “The Setting Sun? Strategic Implications of Japan’s Demographic Transition,” in *Population Decline and the Remaking of Great Power Politics* (Washington, DC: Potomac Books, 2012), 137.

³⁴ Yoshihara, 153.

³⁵ Yoshihara, 154.

³⁶ Yoshihara, 157.

from the post-World War II period to the present. Chapters III and IV transition to the popular conventional wisdom—a country’s population size affects its ability to staff and fund its military. Chapter III examines whether population decline has a negative impact on military manpower (i.e., poses a direct constraint), while Chapter IV examines whether population decline has a negative impact on military funding (i.e., poses an indirect constraint). Both of these chapters explore how Japan has maintained both SDF manning and expenditure levels despite its aging and declining population. Finally, Chapter V summarizes the main findings, speculates on whether current trends will continue, and discusses the limitations of this thesis.

II. JAPAN'S CURRENT DEMOGRAPHIC SITUATION

As the foundation of the research, this chapter explores the demographic transition theory to understand how Japan's current demographic situation came to be. This chapter is divided into two sections. The first section examines Japan's very low total fertility rate (TFR) and its impact on population size. Essentially, the TFR "is the total number of children that a woman would be expected to have if she lived out her entire child-bearing years and had the average number of children at each stage of her life as the overall average experience of all women in her society."³⁷ The second section examines Japan's very high life expectancy and its impact on age structure. Overall, this chapter analyzes Japan's demographic transition from the post-World War II period to the present.

A. DEMOGRAPHIC TRANSITION THEORY

According to Chesnais, "[t]he demographic transition is the process of modernization of the reproductive behavior in human populations."³⁸ Figure 3 illustrates its five stages.

³⁷ Jack A. Goldstone, "A Theory of Political Demography: Human and Institutional Reproduction," in *Political Demography: How Population Changes Are Reshaping International Security and National Politics* (New York, NY: Oxford University Press, 2012), 17.

³⁸ Jean-Claude Chesnais, "Demographic Transition Patterns and Their Impact on the Age Structure," *Population and Development Review* 16, no. 2 (June 1990): 327.

The five stages of the demographic transition Our World in Data

The demographic transition is a model that describes why rapid population growth is a temporary phenomenon.

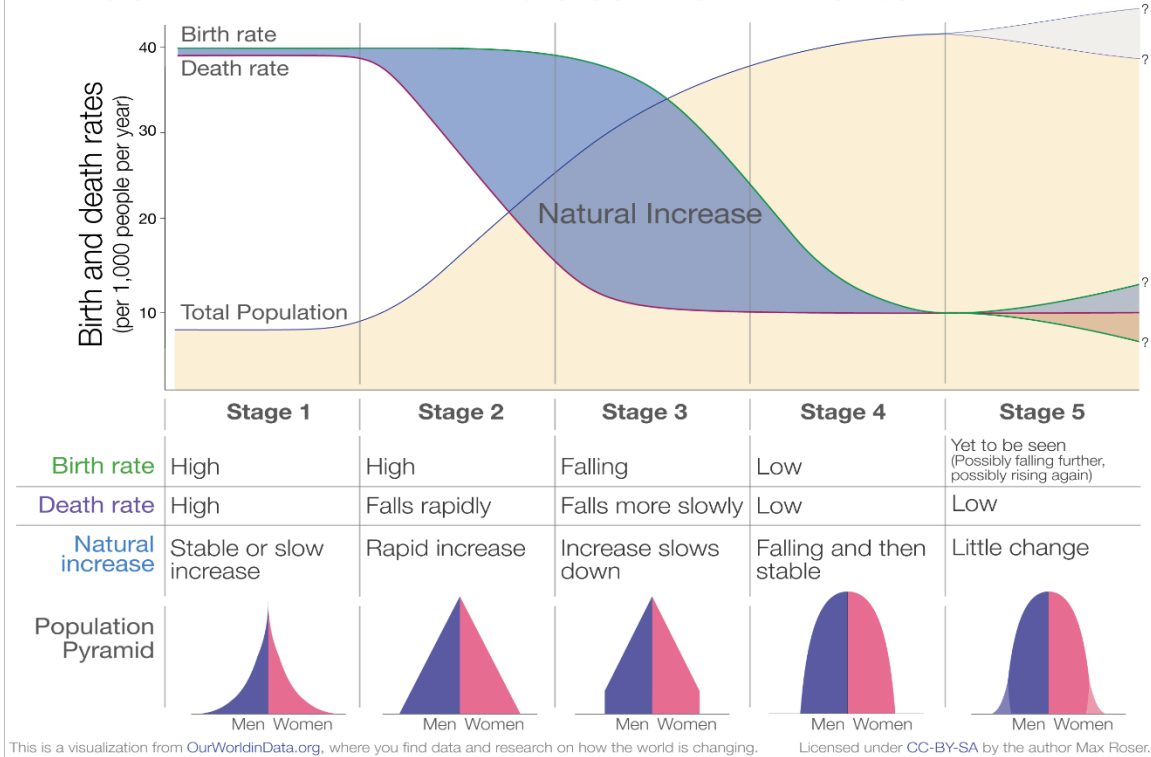


Figure 3. The Demographic Transition Theory³⁹

The first stage is the result of two long-term demographic trends: (1) high TFR and (2) low life expectancy. During this phase, the population gradually expands, forming an expansive population pyramid (i.e., a large working-age group and a small old-age group).⁴⁰ During the second stage of the demographic transition, the population rapidly expands due to high TFR and increasing life expectancy.⁴¹ Eventually, countries enter the third stage. This stage is the result of two long-term demographic trends: (1) decreasing TFR and (2) increasing life expectancy. During this phase, the population gradually expands, forming a smaller working-age group and a larger old-age group.⁴² The fourth

³⁹ Source: Roser Max, Hannah Ritchie, and Esteban Ortiz-Ospina, “World Population Growth,” Our World in Data, May 2019, <https://ourworldindata.org/world-population-growth>.

⁴⁰ Roser Max, Ritchie, and Ortiz-Ospina.

⁴¹ Roser Max, Ritchie, and Ortiz-Ospina.

⁴² Roser Max, Ritchie, and Ortiz-Ospina.

stage is the result of two long-term demographic trends: (1) low TFR and (2) high life expectancy. During this phase, the population gradually shrinks, forming a constrictive population pyramid (i.e., a small working-age group and a large old-age group).⁴³ Finally, the fifth stage is yet to be seen, because only a few countries have reached the late stages of demographic transition. Jackson and Howe state that this demographic pattern appears to be “an inevitable consequence of economic and social development—and so far at least, it appears to be irreversible.”⁴⁴

Although these demographic trends are a global phenomenon, their duration and magnitude vary by country. For example, there are stark differences in population size and age structure between developing and developed countries. Many of today’s developing countries have reached the early stages of demographic transition, while developed countries have reached the late stages, and Japan is one of the latter. Jackson and Howe state that “Japan’s massive age wave is the result of a perfect demographic storm: plunging fertility, soaring life expectancy, and negligible net migration.”⁴⁵ Ogawa, Matsukura, and Maliki add that “[a]s a consequence of these demographic transformations, the age structure of the Japanese population has been shifting to a pronounced degree” (Figures 4 through 7).⁴⁶

⁴³ Roser Max, Hannah Ritchie, and Esteban Ortiz-Ospina, “World Population Growth,” Our World in Data, May 2019, <https://ourworldindata.org/world-population-growth>.

⁴⁴ Richard Jackson and Neil Howe, *The Graying of the Great Powers: Demography and Geopolitics in the 21st Century* (Washington, DC: CSIS, 2008), 45.

⁴⁵ Jackson and Howe.

⁴⁶ Naohiro Ogawa, Rikiya Matsukura, and Maliki, “Rapid Population Aging and Changing Intergenerational Transfers in Japan,” in *International Handbook of Population Aging* (Dordrecht; London: Springer, 2009), 135.

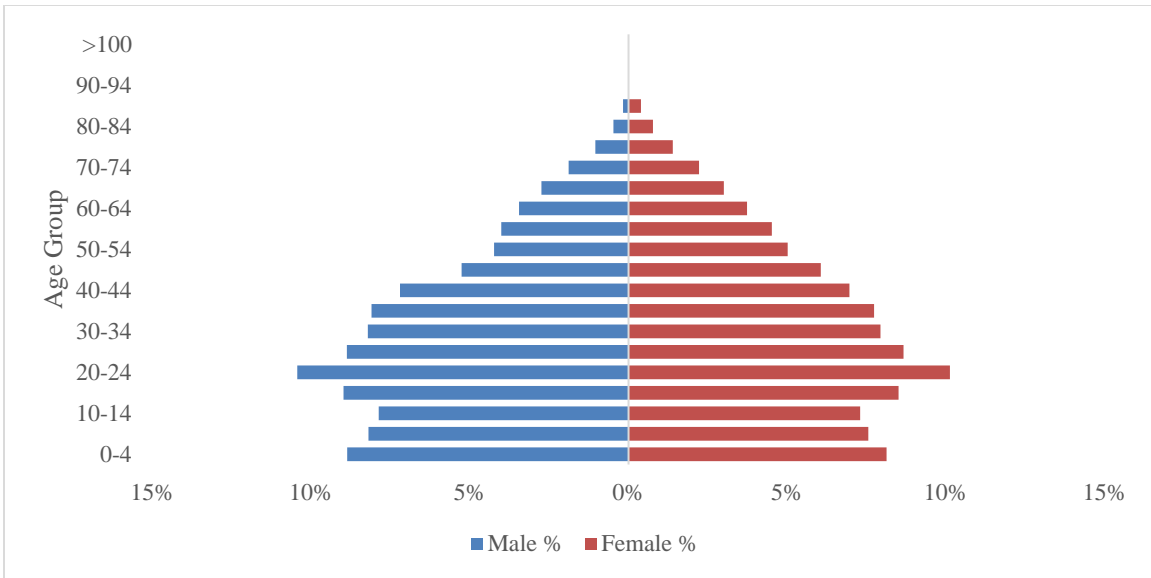


Figure 4. Japan's Population Pyramid: 1970⁴⁷

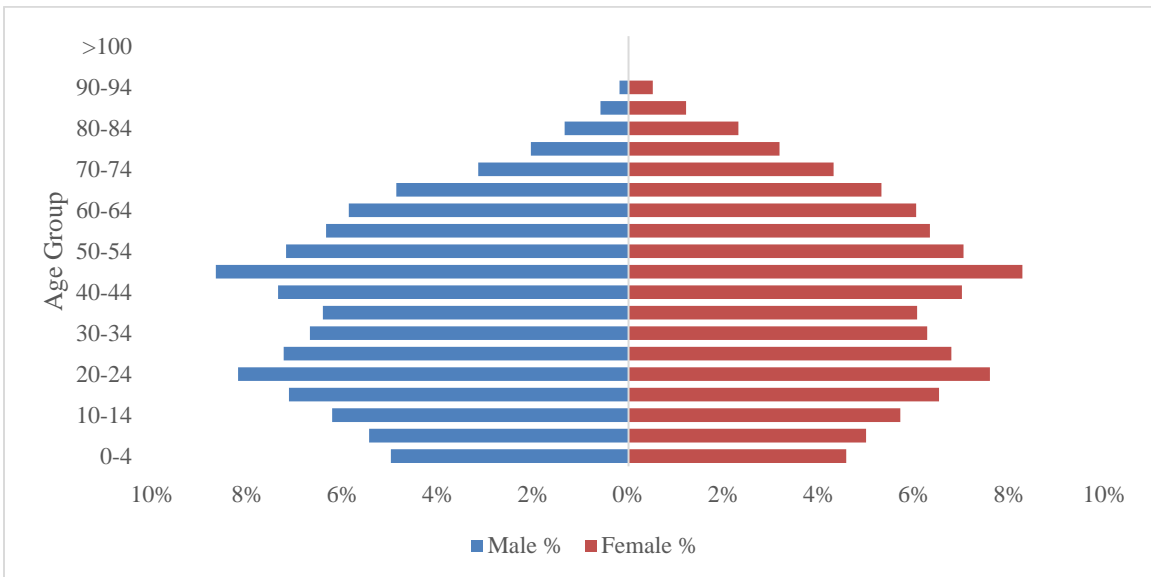


Figure 5. Japan's Population Pyramid: 1995⁴⁸

⁴⁷ Adapted from Ministry of Internal Affairs and Communications, "Population by Age (Single Year) and Sex (as of October 1 of Each Year) - Total Population (from 1920 to 2000)," January 11, 2008, https://www.e-stat.go.jp/en/stat-search/files?page=1&layout=datalist&toukei=00200524&tstat=000000090001&cycle=0&tclass1=000000090004&tclass2=000000090005&stat_infid=000000090264&cycle_facet=tclass1%3Acycle.

⁴⁸ Adapted from Ministry of Internal Affairs and Communications.

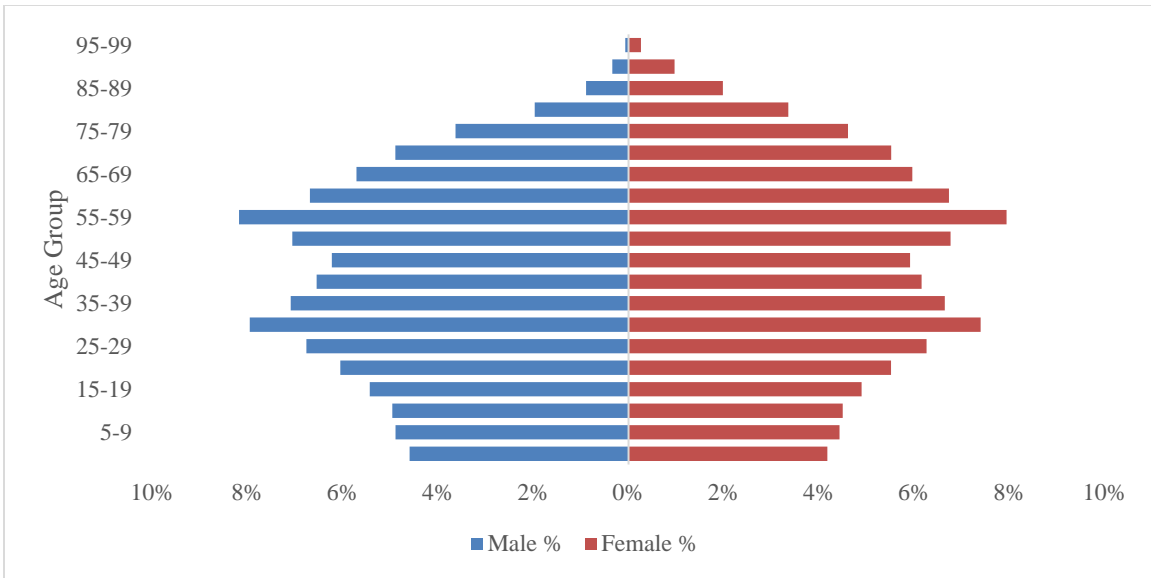


Figure 6. Japan's Population Pyramid: 2005⁴⁹

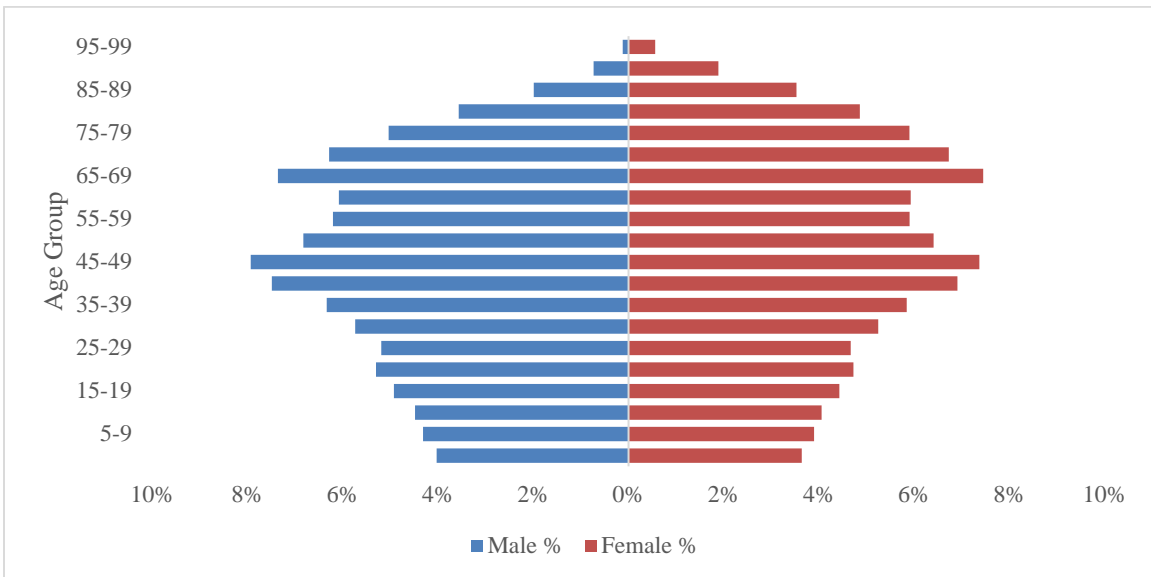


Figure 7. Japan's Population Pyramid: 2018⁵⁰

⁴⁹ Adapted from Ministry of Internal Affairs and Communications.

⁵⁰ Adapted from Ministry of Internal Affairs and Communications.

As these figures show, Japan's current demographic situation is the result of two long-term demographic trends: (1) very low TFR and (2) very high life expectancy (Japan's net migration remains negligible). To combat its demographic trends, Japan has attempted to implement various countermeasures such as pronatal and immigration policies time and again.⁵¹ However, despite these efforts, Japan's population has continued to gray and shrink, further exacerbating its constrictive population pyramid (i.e., a small working-age group and a large old-age group). Komine and Kabe assert that this is because countries tend to respond too late to these demographic trends. This happens for two reasons: (1) it takes time to recognize the problem and (2) it takes time to feel the impact of population aging and decline.⁵²

1. Japan's TFR and its Impact on Population Size

The first concern is decreasing TFR and its impact on population size. Eberstadt states that Japan's fertility decline "has been so steep that it can be described as a virtual collapse."⁵³ Japan's fertility decline can be divided into two phases during the post-World War II period. The first phase can be said to have begun in 1947 and ended in 1957, when Japan's TFR fell below the replacement rate (i.e., TFR of at least 2.1 births per woman) for the first time. Jackson and Howe state that

[...]in the early stages, the decisive factors were industrialization, rising affluence, and the evolution of a middle-class ethos that emphasized investment in the "quality" rather than quantity of children—as well as declining infant and child mortality, which meant that fewer births were needed to achieve any desired family size.⁵⁴

⁵¹ Alexander J. Q. Parsons and Stuart Gilmour, "An Evaluation of Fertility- and Migration-Based Policy Responses to Japan's Ageing Population," *PLoS ONE* 13, no. 12 (December 2018): 1–2.

⁵² Takao Komine and Shigesaburo Kabe, "Long-Term Forecast of the Demographic Transition in Japan and Asia," *Asian Economic Policy Review* 4, no. 1 (June 2009): 27.

⁵³ Nicholas Eberstadt, "Japan Shrinks," *Wilson Quarterly* 36, no. 2 (Spring 2012): 31.

⁵⁴ Richard Jackson and Neil Howe, *The Graying of the Great Powers: Demography and Geopolitics in the 21st Century* (Washington, DC: CSIS, 2008), 47.

Therefore, the first phase was predominantly the result of lower rates of childbearing. In 1947, Japan's TFR was 4.54 births per woman⁵⁵ and its population was 78.1 million people (Figure 8).⁵⁶ By 1957, those numbers were 2.04 births per woman⁵⁷ and 91.08 million people.⁵⁸ Ogawa, Matsukura, and Maliki state that "This 50 per cent reduction of fertility over the 10-year period is the first such experience in the history of mankind."⁵⁹

The second phase began in 1957 and ended in 1974 when Japan's TFR fell below the replacement rate for the second time. Jackson and Howe state that

[...]the dramatic transformation in the social role of women and the structure of the family ... has accelerated the decline. The increase in female educational attainment, the massive entry of women into the labor force, and the rising average age of marriage and childbirth have all played a role in depressing fertility over the past few decades. So too have the widespread diffusion of effective contraception and the legalization of abortion. Another key development may have been the expansion of universal social insurance programs, which weakened one of the oldest incentives for having children: support in old age.⁶⁰

Unlike the first phase, the second phase was predominantly the result of lower and later rates of marriage. Lincoln adds that "[t]he lack of marriage matters for the birth rate because out-of-wedlock births are virtually nonexistent in Japan."⁶¹ In 1974, Japan's TFR was 2.05 births per woman⁶² and its population was 110.04 million people (Figure 8).⁶³

⁵⁵ National Institute of Population and Social Security Research, "Reproduction Rates for Females: 1925–2015," 2017, <http://www.ipss.go.jp/p-info/e/Population%20%20Statistics.asp>.

⁵⁶ Ministry of Internal Affairs and Communications, "Population by Age (from 1920 to 2000)."

⁵⁷ National Institute of Population and Social Security Research.

⁵⁸ Ministry of Internal Affairs and Communications.

⁵⁹ Naohiro Ogawa, Rikiya Matsukura, and Maliki, "Rapid Population Aging and Changing Intergenerational Transfers in Japan," in *International Handbook of Population Aging* (Dordrecht; London: Springer, 2009), 134.

⁶⁰ Richard Jackson and Neil Howe, *The Graying of the Great Powers: Demography and Geopolitics in the 21st Century* (Washington, DC: CSIS, 2008), 47.

⁶¹ Edward J. Lincoln, "Japan's Long-Term Economic Challenges," *Comparative Economic Studies* 53, no. 3 (September 2011): 459.

⁶² National Institute of Population and Social Security Research, "Reproduction Rates for Females."

⁶³ Ministry of Internal Affairs and Communications, "Population by Age (from 1920 to 2000)."

By 1989, those numbers were 1.57 births per woman⁶⁴ and 123.25 million people.⁶⁵ Matsukura, Retherford, and Ogawa state that “The [Japanese] Government became actively concerned about low fertility in 1990, when the TFR for 1989 was announced: 1.57 births per woman, the lowest it had ever been.”⁶⁶ In fact, they claim that “The media picked up the story and the ‘1.57 shock’ hit the headlines throughout the country.”⁶⁷ By 2005, Japan’s TFR had bottomed out at 1.26 births per woman, and it has held steady at roughly 1.4 births per woman since.⁶⁸ By 2010, Japan’s population had peaked at 128.05 million people, and it has continued to shrink since.⁶⁹ Nevertheless, Japan’s TFR remains the sixteenth-lowest in the world (as of 2017).⁷⁰

⁶⁴ National Institute of Population and Social Security Research.

⁶⁵ Ministry of Internal Affairs and Communications.

⁶⁶ Rikiya Matsukura, Robert D. Retherford, and Naohiro Ogawa, “Declining Fertility in Japan: Its Mechanisms and Policy Responses,” *Asia-Pacific Population Journal* 22, no. 2 (August 2007): 40.

⁶⁷ Matsukura, Retherford, and Ogawa.

⁶⁸ National Institute of Population and Social Security Research.

⁶⁹ Ministry of Internal Affairs and Communications, “Population by Age (Single Year) and Sex (as of October 1 of Each Year) - Total Population, Japanese Population (from 2000 to 2015),” June 28, 2017, https://www.e-stat.go.jp/en/stat-search/files?page=1&layout=datalist&toukei=00200524&tstat=000000090001&cycle=0&tclass1=000000090004&tclass2=000001051180&stat_infid=000013168604&cycle_facet=tclass1%3Acycle.

⁷⁰ *The World Factbook 2019* (Washington, DC: Central Intelligence Agency, 2019), <https://www.cia.gov/library/publications/resources/the-world-factbook/docs/rankorderguide.html>.

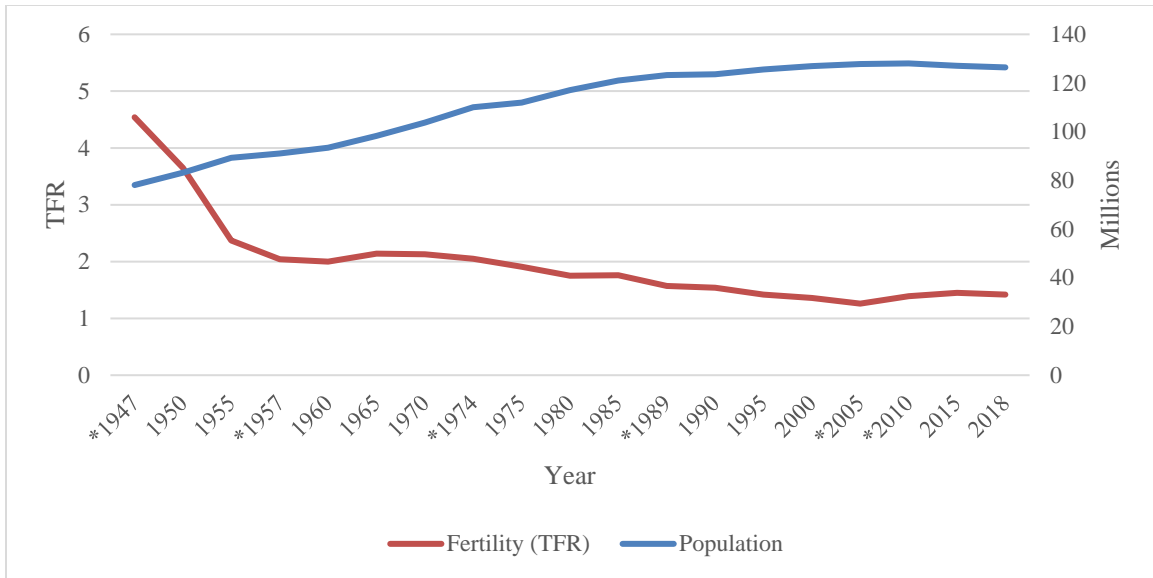


Figure 8. Japan’s Fertility and Population: 1947–2018⁷¹

⁷¹ Adapted from Ministry of Health Labour and Welfare, “Trends in Total Fertility Rates by Each Prefecture: Japan,” November 28, 2019, https://www.e-stat.go.jp/en/stat-search/files?page=1&query=fertility&layout=dataset&kikan=00450&year=20180&stat_infid=000031881308&metadata=1&data=1; Ministry of Internal Affairs and Communications, “Population by Age (from 1920 to 2000)”; Ministry of Internal Affairs and Communications, “Population by Age (from 2000 to 2015)”; Ministry of Internal Affairs and Communications, “Population and Percentage Distribution by Age (Five-Year Groups) and Sex,” April 12, 2019, https://www.e-stat.go.jp/en/stat-search/files?page=1&layout=datalist&toukei=00200524&tstat=00000090001&cycle=7&year=20180&tclass1=000001011679&stat_infid=000031807140&cycle_facet=tclass1%3Acycle; National Institute of Population and Social Security Research, “Reproduction Rates for Females.”

2. Japan's Life Expectancy and its Impact on Age Structure

The second concern is increasing life expectancy and its impact on age structure.

Jackson and Howe state that

[...]until the mid-twentieth century, the rise in life expectancy was due primarily to reductions in mortality at younger ages, as improved nutrition and sanitation, followed by the development of vaccines and antibiotics, dramatically lowered the toll of infectious disease. More recently, reductions in mortality at older ages have played the dominant role, as modern medicine has begun to make inroads against the chronic diseases that afflict the middle-aged and the elderly.⁷²

In 1947, Japan's life expectancy was age 51.68⁷³ and its old-age group consisted of 3.74 million people (Figure 9).⁷⁴ In 1989, those numbers were age 78.95⁷⁵ and 14.3 million people.⁷⁶ By 2005, Japan's life expectancy increased to age 82.03, and it has continued to increase since.⁷⁷ During that same year, Japan's old-age group expanded to 25.75 million people, and it has continued to expand since.⁷⁸ Consequently, Japan's life expectancy became the second-highest in the world in 2017.⁷⁹

⁷² Richard Jackson and Neil Howe, *The Graying of the Great Powers: Demography and Geopolitics in the 21st Century* (Washington, DC: CSIS, 2008), 55.

⁷³ National Institute of Population and Social Security Research, "Life Expectancy at Birth," July 25, 2018, <http://www.ipss.go.jp/p-toukei/jmd/00/index-en.html>.

⁷⁴ Ministry of Internal Affairs and Communications, "Population by Age (Single Year) and Sex (as of October 1 of Each Year) - Total Population (from 1920 to 2000)," January 11, 2008, https://www.e-stat.go.jp/en/stat-search/files?page=1&layout=datalist&toukei=00200524&tstat=000000090001&cycle=0&tclass1=000000090004&tclass2=000000090005&stat_infid=000000090264&cycle_facet=tclass1%3Acycle.

⁷⁵ National Institute of Population and Social Security Research.

⁷⁶ Ministry of Internal Affairs and Communications.

⁷⁷ National Institute of Population and Social Security Research.

⁷⁸ Ministry of Internal Affairs and Communications, "Population by Age (from 2000 to 2015)."

⁷⁹ *The World Factbook 2019* (Washington, DC: Central Intelligence Agency, 2019), <https://www.cia.gov/library/publications/resources/the-world-factbook/docs/rankorderguide.html>.

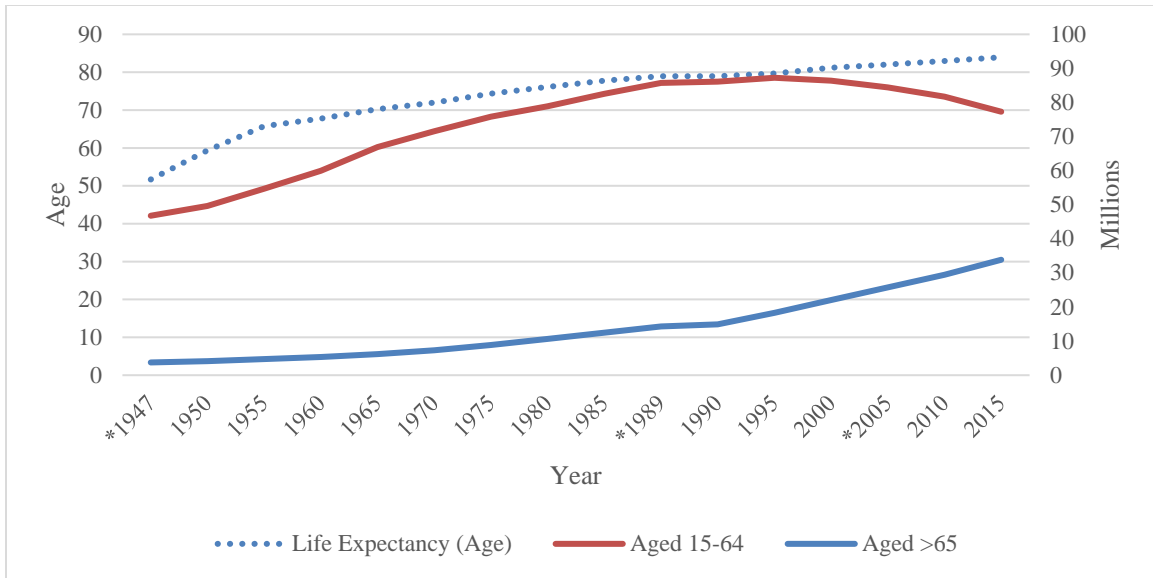


Figure 9. Japan’s Life Expectancy and Age Structure: 1947–2015⁸⁰

Miskolczi and Cséfalvaiová define aging-, aged-, and super-aged societies as those with an old-age group of over seven percent, 14 percent, and 20 percent of the total population, respectively.⁸¹ They further add that an ultra-aged society “denotes population with [a] proportion of seniors in the age [of] 65 years and more at the level 28 % and above.”⁸² In other words, it could be argued that Japan became an aging, aged, and super-aged society in 1970, 1995, and 2005, respectively (Figure 10).⁸³ Moreover, if we include Miskolczi and Cséfalvaiová’s “ultra-aged society” category, then Japan became an ultra-aged society in 2018 (Figure 10).⁸⁴ According to Sciubba, “These ‘top-heavy’ proportions are what worry military planners, economists, and others.”⁸⁵

⁸⁰ Adapted from Ministry of Internal Affairs and Communications, “Population by Age (from 1920 to 2000)”;

Ministry of Internal Affairs and Communications, “Population by Age (from 2000 to 2015)”;

National Institute of Population and Social Security Research, “Reproduction Rates for Females.”

⁸¹ Martina Miskolczi and Kornélia Cséfalvaiová, “Process of Population Ageing and Its Dynamic,” *The 7th International Days of Statistics and Economics*, September 2013: 1022.

⁸² Miskolczi and Cséfalvaiová: 1021.

⁸³ Statistics Bureau of Japan, “Population of Japan (Final Report of the 2005 Population Census),” 2005, <https://www.stat.go.jp/english/data/kokusei/2005/nihon/index.html>.

⁸⁴ Ministry of Internal Affairs and Communications, “Population and Percentage Distribution.”

⁸⁵ Sciubba, *The Future Faces of War*, 41.

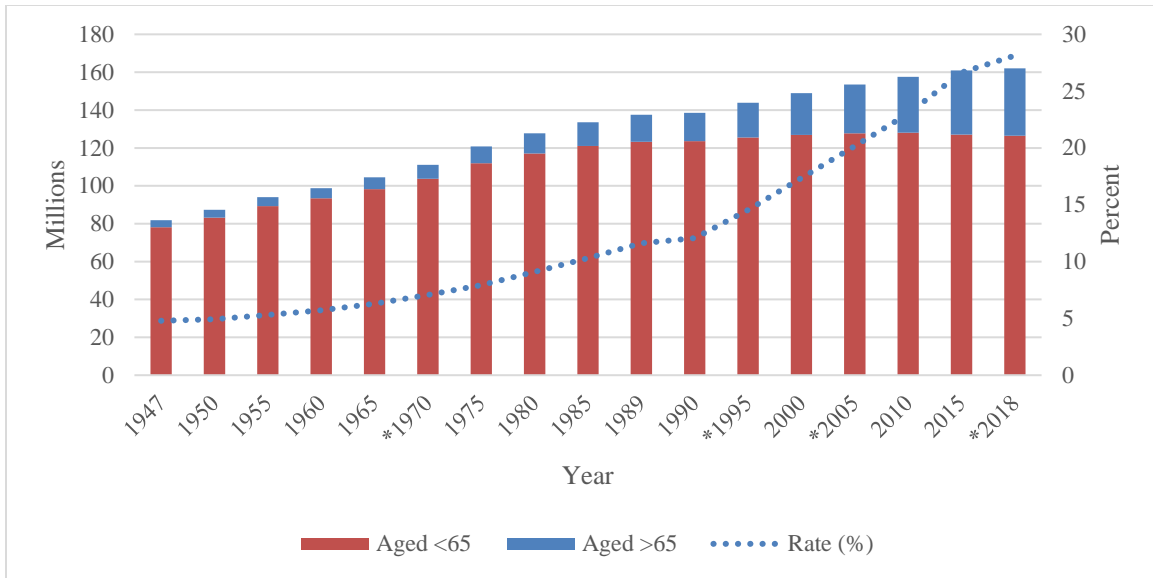


Figure 10. Japan's Old-Age Group: 1947–2018⁸⁶

B. JAPAN'S NET MIGRATION AND SUMMARY

Although not as significant as its very low TFR and very high life expectancy, Japan's net migration is worth mentioning. In 2015, Japan's net migration was 0.25 million people (Figure 11).⁸⁷ To put things in perspective, according to the United Nations, during that same year, the U.S. net migration was 4.77 million people.⁸⁸ Higher net migration rates might have positive implications for economic growth. However, simultaneously, it could be argued that higher net migration rates may not matter for recruitment pool size if we assume that militaries, like the SDF, recruit only their own citizens.

⁸⁶ Adapted from Ministry of Internal Affairs and Communications, "Population by Age (from 1920 to 2000)"; Ministry of Internal Affairs and Communications, "Population by Age (from 2000 to 2015)"; Ministry of Internal Affairs and Communications, "Population and Percentage Distribution."

⁸⁷ National Institute of Population and Social Security Research, "Immigrants and Emigrants by Japanese and Foreigners: 1950–2015," 2017, <http://www.ipss.go.jp/p-info/e/psj2017/psj2017.asp>.

⁸⁸ United Nations, "Net number of migrants (both sexes combined) by region, subregion and country, 1950–2100 (Thousands)," 2019, <https://population.un.org/wpp/Download/Standard/Migration/>.

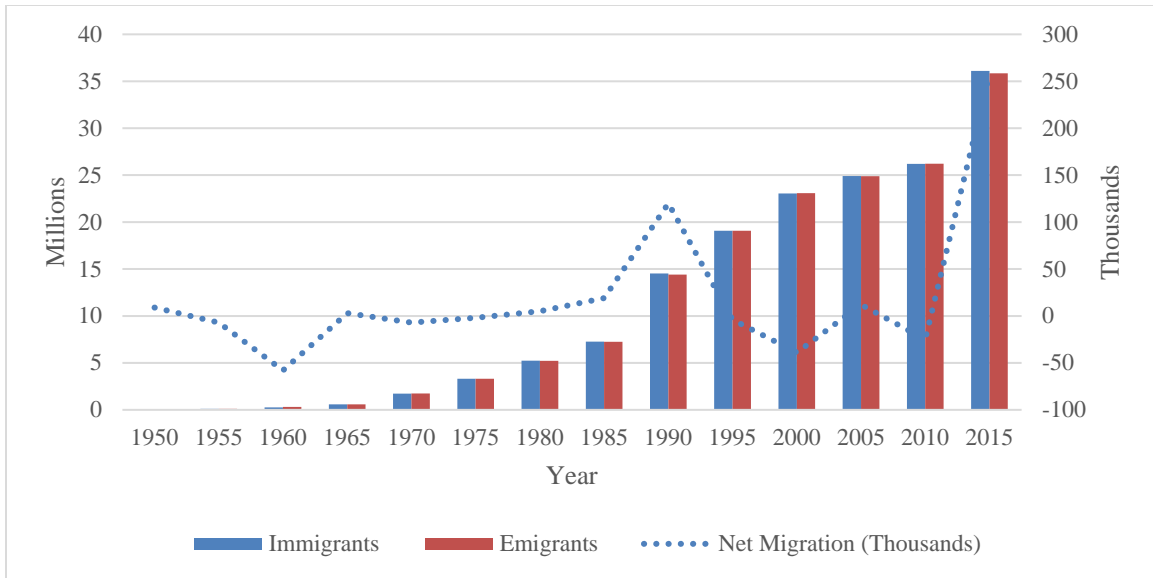


Figure 11. Japan’s Net Migration: 1950–2015⁸⁹

As the foundation of the research, this chapter examined the demographic transition theory to understand how Japan’s current demographic situation came to be. It has shown that many of today’s developed countries have reached the late stages of the demographic transition, and Japan is no exception. Recently, Japan’s TFR has held steady at roughly 1.4 births per woman and its population has continued to shrink. Simultaneously, Japan’s life expectancy has continued to increase and its old-age group has continued to expand, forming a constrictive population pyramid (i.e., a small working-age group and a large old-age group). In short, Japan has shown no sign of slowing down its population aging and decline.

⁸⁹ Adapted from National Institute of Population and Social Security Research, “Reproduction Rates for Females.”

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III. DIRECT POPULATION CONSTRAINTS ON MILITARY MANPOWER

This chapter analyzes the popular conventional wisdom—a country’s population size affects its ability to staff and fund its military—and its application to Japan. Specifically, this chapter explores whether population decline has a negative impact on military manpower (i.e., poses a direct constraint), and is divided into two sections. The first section identifies the yardstick used to measure the direct constraints of population on military manpower: the SDF’s staffing rate and authorized strength. The second section examines the two main methods Japan has most likely used to avoid the direct constraints of population on military manpower: (1) recruitment policies and (2) capital intensity. This chapter finds that Japan has maintained the SDF’s manning at sufficient levels despite a shrinking recruitment pool. This is possible because the SDF has more than enough applicants to maintain its historical 90 percent staffing rate, and could even achieve a 100 percent staffing rate if it so chose. An apparent applicant surplus seems thus far to have served as a buffer against the effects of population aging and decline.

A. THE SDF’S RECRUITMENT POOL

According to Sciubba, “[t]he size of the total population is not the primary concern in aging states; which segments of the population are growing matters more.”⁹⁰ Japan is experiencing population aging and decline. This could be particularly devastating for the SDF because its recruitment pool is defined as Japanese citizens of military age (aged 18 to 26, or to 32 as of 2018).⁹¹ In 1947, the SDF’s recruitment pool consisted of 12.55 million people, or 16.08 percent of the total population (Figure 12).⁹² In 1957, that number was

⁹⁰ Sciubba, *The Future Faces of War*, 52.

⁹¹ Ministry of Defense, *Defense of Japan 2019* (Tokyo: Japan Ministry of Defense, 2019), https://www.mod.go.jp/e/publ/w_paper/2019.html.

⁹² Ministry of Internal Affairs and Communications, “Population by Age (Single Year) and Sex (as of October 1 of Each Year) - Total Population (from 1920 to 2000),” January 11, 2008, https://www.e-stat.go.jp/en/stat-search/files?page=1&layout=datalist&toukei=00200524&tstat=000000090001&cycle=0&tclass1=000000090004&tclass2=000000090005&stat_infid=000000090264&cycle_facet=tclass1%3Acycle.

15.17 million people, or 16.66 percent.⁹³ By 1969, the SDF’s recruitment pool had peaked at 18.13 million people, or 17.67 percent, and it has continued to shrink since.⁹⁴

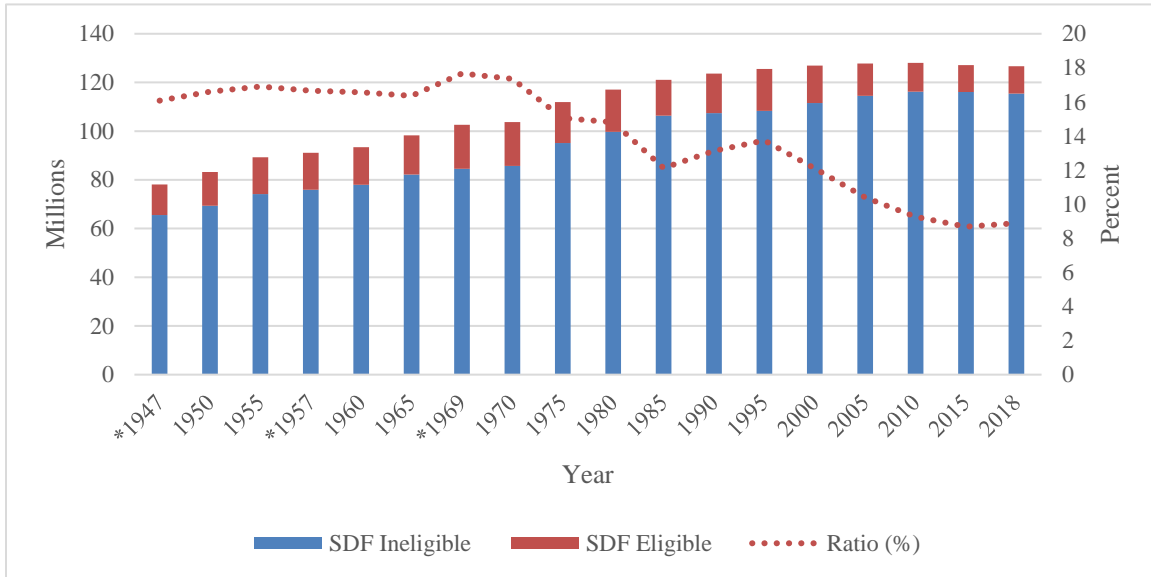


Figure 12. The SDF’s Recruitment Pool: 1947–2018⁹⁵

The SDF’s staffing rate is calculated by dividing actual strength by authorized strength. The staffing rate is the most efficient measure of the direct constraints of population on military manpower. That is, so long as we assume that authorized strengths are not purposely manipulated down precisely to improve staffing rates, something we have no particular reason to think occurs in Japan: as noted below, the SDF’s authorized strength has remained fairly constant even as the recruitment pool shrinks and mission sets expand.

⁹³ Ministry of Internal Affairs and Communications, “Population by Age (Single Year) and Sex (as of October 1 of Each Year) - Total Population (from 1920 to 2000),” January 11, 2008, https://www.e-stat.go.jp/en/stat-search/files?page=1&layout=datalist&toukei=00200524&tstat=000000090001&cycle=0&tclass1=000000090004&tclass2=000000090005&stat_infid=000000090264&cycle_facet=tclass1%3Acycle.

⁹⁴ Ministry of Internal Affairs and Communications.

⁹⁵ Adapted from Ministry of Internal Affairs and Communications, “Population by Age (from 1920 to 2000)”;

Ministry of Internal Affairs and Communications, “Population by Age (from 2000 to 2015);”

Ministry of Internal Affairs and Communications, “Population and Percentage Distribution by Age.”

In 1980, the SDF's staffing rate was 89.63 percent (Figure 13).⁹⁶ In 2005, that number had peaked at 94.56 percent.⁹⁷ By 2015, the SDF's staffing rate dropped to 91.73 percent, and it has held steady at roughly 92 percent since.⁹⁸

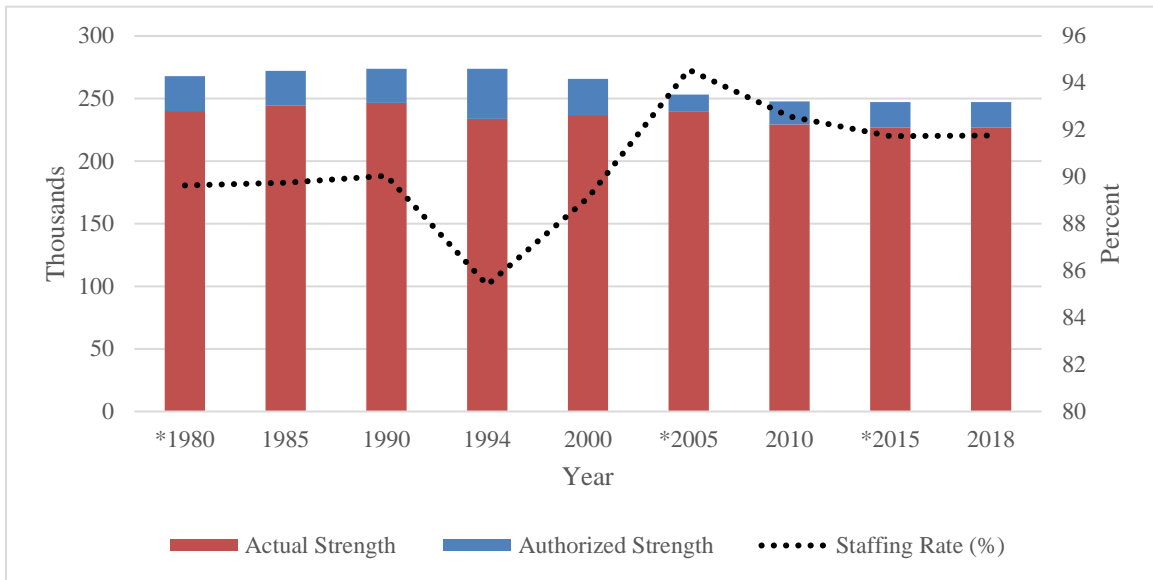


Figure 13. The SDF's Staffing Rate: 1980–2018⁹⁹

⁹⁶ Ministry of Defense, *Defense of Japan 1980* (Tokyo: Japan Ministry of Defense, 1980), http://www.clearing.mod.go.jp/hakusho_data/1980/w1980_00.html.

⁹⁷ Ministry of Defense, *Defense of Japan 2005* (Tokyo: Japan Ministry of Defense, 2005), https://www.mod.go.jp/e/publ/w_paper/2005.html.

⁹⁸ Ministry of Defense, *Defense of Japan 2015* (Tokyo: Japan Ministry of Defense, 2015), https://www.mod.go.jp/e/publ/w_paper/2015.html.

⁹⁹ Total size of bar equates to total authorized strength. Adapted from Ministry of Defense, *Defense of Japan 1980*; Ministry of Defense, *Defense of Japan 1985* (Tokyo: Japan Ministry of Defense, 1985), http://www.clearing.mod.go.jp/hakusho_data/1985/w1985_00.html; Ministry of Defense, *Defense of Japan 1990* (Tokyo: Japan Ministry of Defense, 1990), http://www.clearing.mod.go.jp/hakusho_data/1990/w1990_00.html; Ministry of Defense, *Defense of Japan 1994* (Tokyo: Japan Ministry of Defense, 1994), http://www.clearing.mod.go.jp/hakusho_data/1994/w1994_00.html; Ministry of Defense, *Defense of Japan 2000* (Tokyo: Japan Ministry of Defense, 2000), http://www.clearing.mod.go.jp/hakusho_data/2000/w2000_00.html; Ministry of Defense, *Defense of Japan 2005*; Ministry of Defense, *Defense of Japan 2010* (Tokyo: Japan Ministry of Defense, 2010), https://www.mod.go.jp/e/publ/w_paper/2010.html; Ministry of Defense, *Defense of Japan 2015*; Ministry of Defense, *Defense of Japan 2018* (Tokyo: Japan Ministry of Defense, 2018), https://www.mod.go.jp/e/publ/w_paper/2018.html.

At a glance, it could be argued that a military that has “always fallen well below its staffing levels” is either affected by population size or struggles to compete with the private sector. Eldridge states, as an apparently negative judgment, that “[t]he SDF has always fallen well below its staffing levels, meaning that most units are not at or have never truly been at full (or authorized) strength.”¹⁰⁰ However, this is not for lack of qualified applicants. On the contrary, the SDF has more than enough applicants to maintain its historical 90 percent staffing rate, and could even achieve a 100 percent staffing rate if it so chose. In effect, the SDF has “always fallen well below its staffing levels” *deliberately*.

A staffing rate of less than 100 percent is not inherently a shortcoming for the SDF (and it may even be that the SDF’s authorized strength is knowingly set too high for administrative purposes, with sub-100 percent staffing rates expected in roughly the same way that an unemployment rate slightly above zero can be considered normal and even reflective of healthy churn in an economy). Although the SDF, like most militaries, has its critics with regard to its operations, the SDF has not been widely viewed as understaffed *relative to its chosen missions* over these decades, during which its staffing rate has held steady at roughly 92 percent. The notion of understaffing as a deficiency appears to be applied more to fears for the future than to any current operational problems. If anything, the SDF has lately been criticized for doing too *much*, not too little.

More important, putting aside the relationship of staffing rate to military effectiveness, it is the staffing rate and overall force size themselves, more narrowly, that analysts worried about population decline expect to suffer, and yet, the SDF’s staffing rate and authorized strength have held steady at their pre-population-decline levels (and importantly, this has not been accompanied by a decline in the SDF’s mission sets and general competence—if anything, the reverse is widely thought to be the case) (Figures 14 and 15).

¹⁰⁰ Robert D. Eldridge, “Japan’s Changing Demographics and the Impact on its Military,” *Education About Asia* 22, no. 3 (Winter 2017): 28.

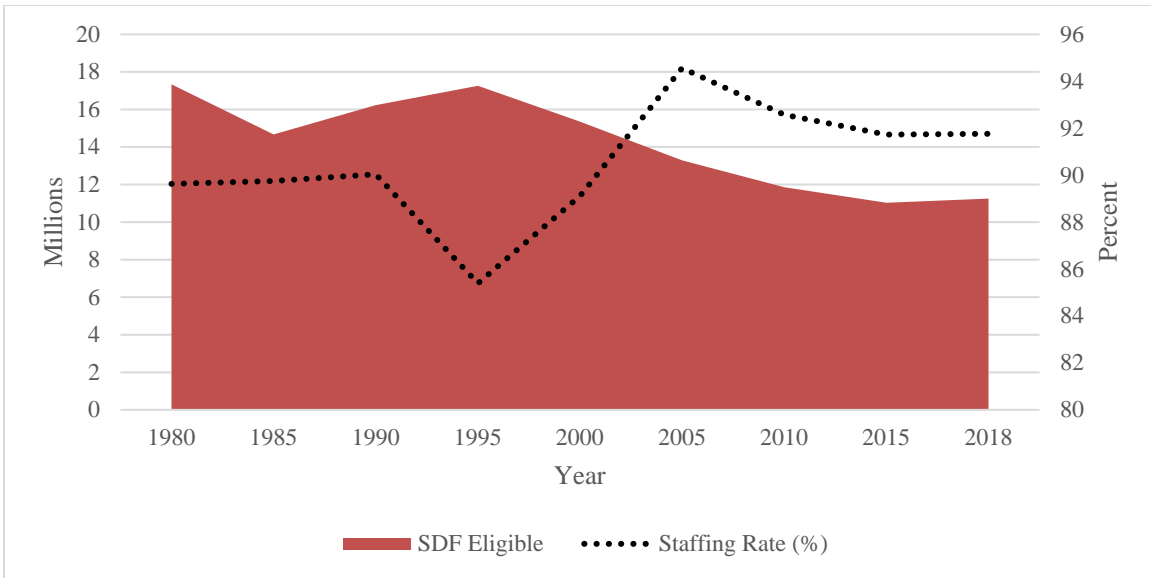


Figure 14. The SDF's Recruitment Pool vs. Staffing Rate: 1980–2018¹⁰¹

¹⁰¹ Adapted from Ministry of Defense, *Defense of Japan 1980; Defense of Japan 1985; Defense of Japan 1990; Defense of Japan 1994; Defense of Japan 2000; Defense of Japan 2005; Defense of Japan 2010; Defense of Japan 2015; Defense of Japan 2018*; Ministry of Internal Affairs and Communications, “Population by Age (from 1920 to 2000)”; Ministry of Internal Affairs and Communications, “Population by Age (from 2000 to 2015)”; Ministry of Internal Affairs and Communications, “Population and Percentage Distribution by Age.”

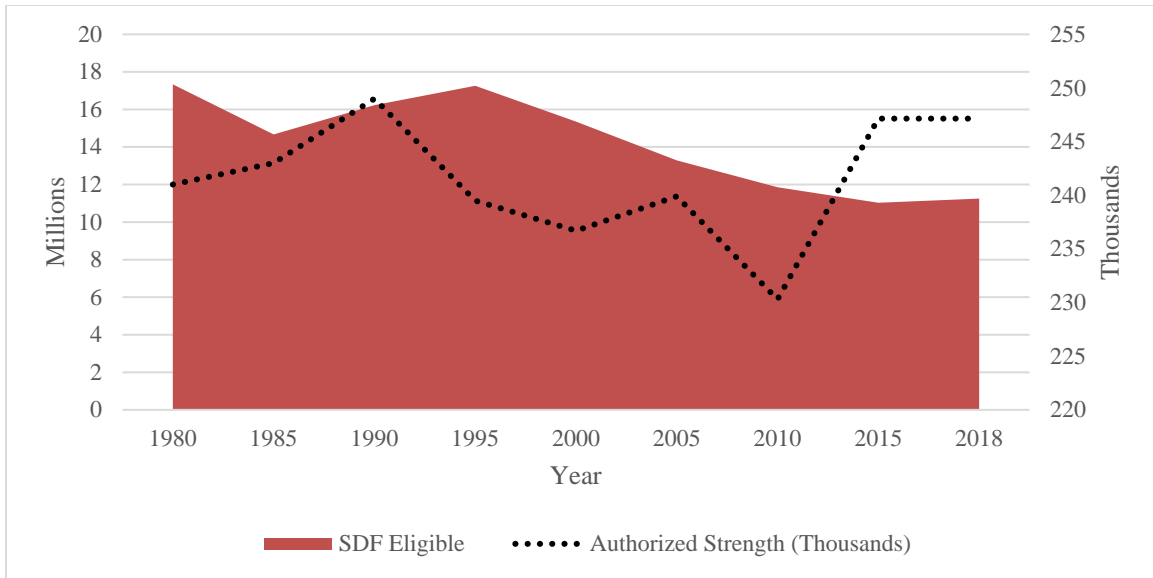


Figure 15. The SDF’s Recruitment Pool vs. Authorized Strength: 1980–2018¹⁰²

¹⁰² Adapted from “Asia and Australasia,” *The Military Balance* 80, no. 1 (January 1980); “Asia and Australasia,” *The Military Balance* 85, no. 1 (January 1985); “Asia and Australasia,” *The Military Balance* 90, no. 1 (January 1990); “East Asia and Australasia,” *The Military Balance* 95, no. 1 (January 1995); “East Asia and Australasia,” *The Military Balance* 100, no. 1 (January 2000); “East Asia and Australasia,” *The Military Balance* 105, no. 1 (January 2005); “Chapter Eight: East Asia and Australasia,” *The Military Balance* 110, no. 1 (February 2010); “Chapter Six: Asia,” *The Military Balance* 115, no. 1 (January 2015); “Chapter Six: Asia,” *The Military Balance* 118, no. 1 (January 2018); Ministry of Internal Affairs and Communications, “Population by Age (from 1920 to 2000);” Ministry of Internal Affairs and Communications, “Population by Age (from 2000 to 2015);” Ministry of Internal Affairs and Communications, “Population and Percentage Distribution by Age.”

It could be argued that the SDF’s staffing rate could be *artificially* maintained by purposely manipulating down its authorized strength. But this is not the case: population decline has not coincided with a reduction in authorized strength. Officially established in 1954, the SDF is governed by the MOD and entrusted with the defense of Japan. Moreover, the MOD consists of three service branches: (1) the Ground Self-Defense Force (GSDF), (2) the Maritime Self-Defense Force (MSDF), and (3) the Air Self-Defense Force (ASDF). Although the sizes of the GSDF, MSDF, and ASDF have fluctuated slightly over the past 38 years, the overall force size has held steady at roughly 240,000 active personnel (Figure 16).

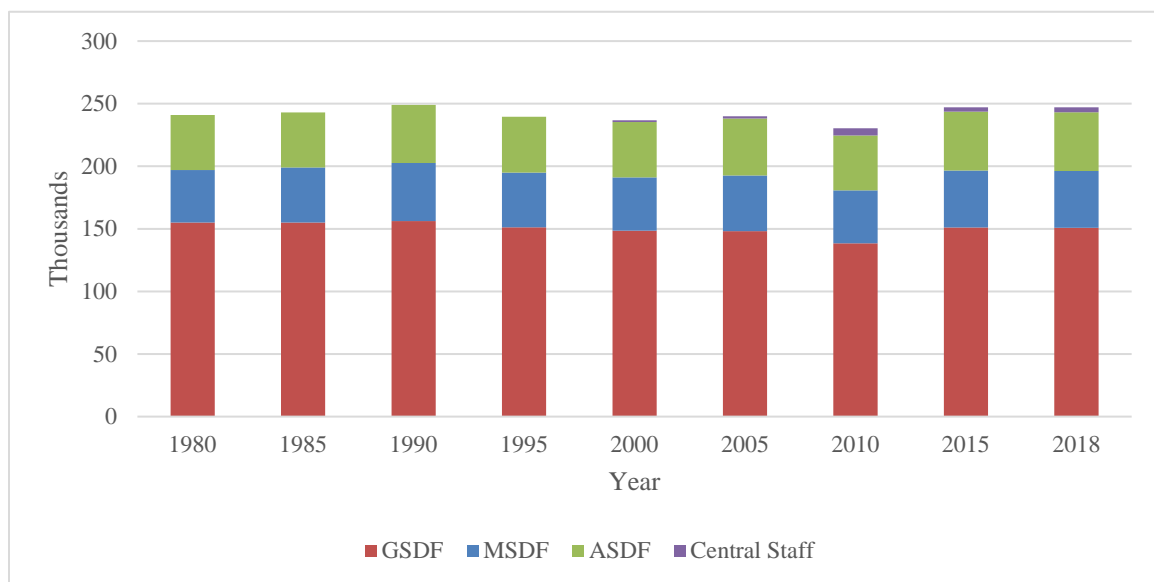


Figure 16. The SDF’s Authorized Strength by Service Branch: 1980–2018¹⁰³

¹⁰³ Adapted from “Asia and Australasia,” *The Military Balance* 80, no. 1 (January 1980); “Asia and Australasia,” *The Military Balance* 85, no. 1 (January 1985); “Asia and Australasia,” *The Military Balance* 90, no. 1 (January 1990); “East Asia and Australasia,” *The Military Balance* 95, no. 1 (January 1995); “East Asia and Australasia,” *The Military Balance* 100, no. 1 (January 2000); “East Asia and Australasia,” *The Military Balance* 105, no. 1 (January 2005); “Chapter Eight: East Asia and Australasia,” *The Military Balance* 110, no. 1 (February 2010); “Chapter Six: Asia,” *The Military Balance* 115, no. 1 (January 2015); “Chapter Six: Asia,” *The Military Balance* 118, no. 1 (January 2018).

B. INSULATING THE SDF'S STAFFING RATE FROM A SHRINKING RECRUITMENT POOL

This section investigates how Japan has maintained the SDF's manning at sufficient levels despite a shrinking recruitment pool. It examines the two main methods Japan has most likely used to avoid the direct constraints of population on military manpower: (1) recruitment policies and (2) capital intensity. To be clear, this section does not provide evidence showing that these methods, and these methods alone, helped the SDF maintain its staffing rate and authorized strength. Instead, this section introduces methods Japan has likely undertaken that can plausibly be thought to have helped sustain the SDF's manning at consistent (and arguably sufficient) levels despite its aging and declining population.

1. Recruitment Policies

According to Bicksler and Nolan, “[w]hile the military cannot change ... external factors directly, it can employ policy tools to counter the effects of economic, demographic, and political conditions.”¹⁰⁴ In other words, militaries cannot directly control their recruitment pool size, but they can manipulate their recruitment policies in order to attract enough recruits. Most broadly, for example, Krebs and Levy state that these demographic trends “will obviously have very different effects, all else being equal, on the size of the military in a state with mandatory service and in one with an all-volunteer force.”¹⁰⁵ Their effects could be particularly devastating for Japan because it implements an all-volunteer force. In contrast, Singapore and South Korea, whose TFRs fall even below Japan's, implement compulsory military service.¹⁰⁶ This insulates the Singaporean and South Korean armed forces from competition with other employers (even if it cannot affect the size of the overall recruitment pool).

¹⁰⁴ Barbara A. Bicksler and Lisa G. Nolan, *Recruiting an All-Volunteer Force: The Need for Sustained Investment in Recruiting Resources—An Update*. Arlington, VA: Strategic Analysis, 2009, 3.

¹⁰⁵ Ronald R. Krebs and Jack S. Levy, “Demographic Change and the Sources of International Conflict,” in *Demography and National Security* (New York, NY: Berghahn Books, 2001), 65.

¹⁰⁶ World Bank, “Fertility rate, total (births per woman) - Singapore, Korea, Rep.,” Accessed January 10, 2020, <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?end=2017&locations=SG-KR&start=2005>.

Japan cannot implement compulsory military service due to its constitution, but it might manipulate the military's recruitment policies in five areas: (1) recruitment rate, (2) reserve personnel, (3) female personnel, (4) maximum age limit and retirement age, and (5) public relations.

a. Recruitment Rate

The first method of maintaining staffing rates and overall force sizes amid population decline might be to lower military recruitment standards and admit larger share of applicants in order to maintain recruitment yields as the recruitment pool shrinks. If anything, though, the applicant pool has only expanded, on balance, as the size of the potential recruitment pool has shrunk, and ultimately the percentage of recruited applicants—the recruitment rate—has declined. Yamaguchi states that “[w]hile the JSDF has had some hard times in recruiting service personnel because of its all-volunteer system, it has enjoyed a large number of applicants who are determined to devote their professional careers to the JSDF.”¹⁰⁷ In 1980, the SDF's total number of applicants was 65,651 people (36.25 percent recruitment rate or 63.75 percent rejection rate) (Figure 17).¹⁰⁸ In 2000, this number was 100,718 people (11.27 percent recruitment rate or 88.73 percent rejection rate).¹⁰⁹ By 2015, the SDF's total number of applicants dropped to 60,563 people (20.62 percent recruitment rate or 79.38 percent rejection rate), but still not below pre-population-decline levels.¹¹⁰ The data suggest that Japan has maintained the SDF's manning at sufficient levels despite a shrinking recruitment pool without having to lower military recruitment standards.

¹⁰⁷ Noboru Yamaguchi, “Japan: Completing Military Professionalism,” in *Military Professionalism in Asia: Conceptual and Empirical Perspectives* (Honolulu, HI: East-West Center, 2001), 35.

¹⁰⁸ Ministry of Defense, *Defense of Japan 1981* (Tokyo: Japan Ministry of Defense, 1981), http://www.clearing.mod.go.jp/hakusho_data/1981/w1981_00.html.

¹⁰⁹ Ministry of Defense, *Defense of Japan 2001* (Tokyo: Japan Ministry of Defense, 2001), http://www.clearing.mod.go.jp/hakusho_data/2001/w2001_00.html.

¹¹⁰ Ministry of Defense, *Defense of Japan 2006* (Tokyo: Japan Ministry of Defense, 2006), https://www.mod.go.jp/e/publ/w_paper/2006.html.

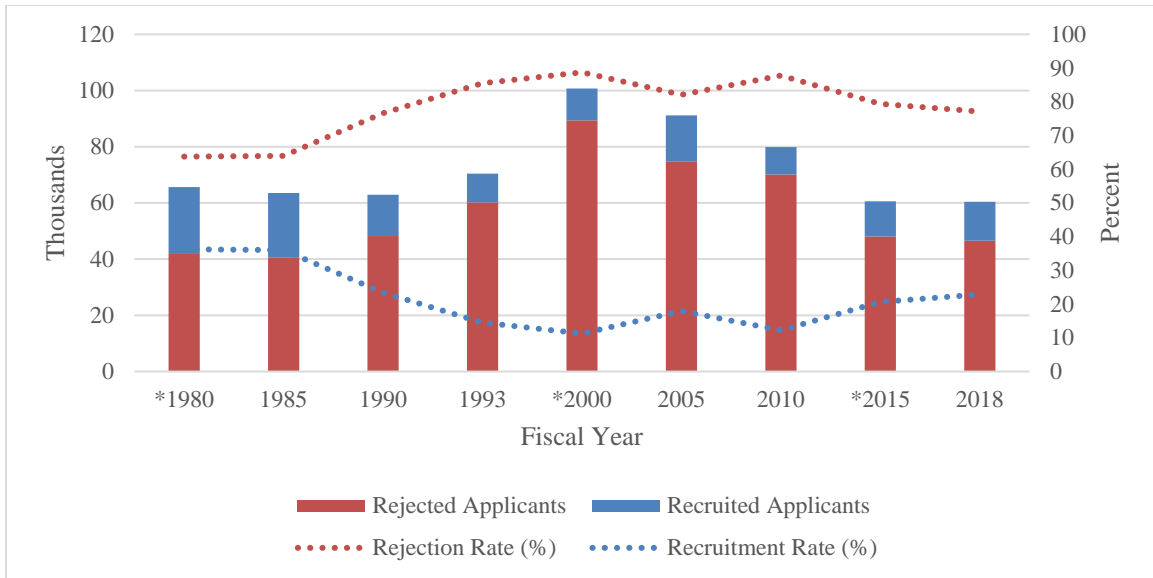


Figure 17. The SDF's Rejection Rate vs. Recruitment Rate: FY1980–2018¹¹¹

b. Reserve Personnel

The SDF's three reserve components include (1) SDF Reserve Personnel, (2) SDF Ready Reserve Personnel, and (3) Candidates for SDF Reserve Personnel. The *Defense of Japan 2019* states that

SDF Reserve Personnel become uniformed SDF personnel upon the issuance of a defense call-up order or other orders, and carry out logistical support and base guard duties. SDF Ready Reserve Personnel become uniformed SDF personnel and are assigned to carry out their mission together with incumbent uniformed SDF personnel as part of frontline units following the issuance of a defense call-up order or other orders. Candidates for SDF Reserve Personnel, some of whom are recruited among those with no prior experience as uniformed SDF personnel, are appointed as SDF Reserve Personnel after completing the necessary education and training.¹¹²

The second method of maintaining staffing rates and overall force sizes amid population decline might be to manipulate the military's recruitment policies by increasing reserve

¹¹¹ Adapted from Ministry of Defense, *Defense of Japan 1980; Defense of Japan 1985; Defense of Japan 1990; Defense of Japan 1994; Defense of Japan 2000; Defense of Japan 2005; Defense of Japan 2010; Defense of Japan 2015; Defense of Japan 2018*.

¹¹² Ministry of Defense, *Defense of Japan 2019*.

numbers. To be clear, the SDF's staffing rate or authorized strength does not include reserve personnel. Therefore, reserve personnel represent "bonus" personnel who increase the *true* size of the overall force even higher than the SDF's official staffing rate and authorized strength suggest.

But since, as noted above, the SDF's staffing rate and authorized strength have held steady at their pre-population-decline levels, the reserves clearly do not serve to mask some hidden shortfall. If our narrow concern is staffing rate and overall force size for their own sake, then no problem exists in the first place for reserve numbers to help solve. However, if we posit that the SDF, given its expanding mission sets, can only preserve military effectiveness by *increasing* its overall force size, not simply maintaining it, then an increase in reserve numbers might be one explanation for how the SDF has (arguably) managed to accomplish this thus far. The number of reserve personnel has indeed expanded, though this increase is modest as a share of the overall force size. In 1980, the SDF's number of reserve personnel was 39,600 people (Figure 18).¹¹³ In 2010, this number was 41,800 people.¹¹⁴ By 2015, the SDF's number of reserve personnel jumped to 56,100 people.¹¹⁵

¹¹³ "Asia and Australasia," *The Military Balance* 80, no. 1 (January 1980).

¹¹⁴ "Chapter Eight: East Asia and Australasia," *The Military Balance* 110, no. 1 (February 2010).

¹¹⁵ "Chapter Six: Asia," *The Military Balance* 115, no. 1 (January 2015).

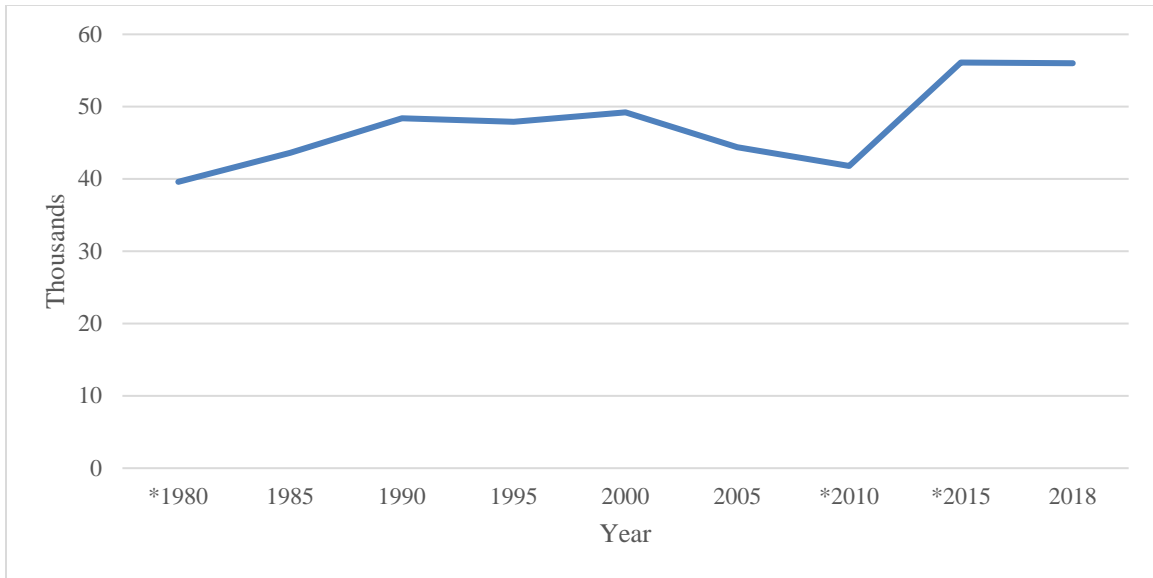


Figure 18. The SDF's Reserve Personnel: 1980–2018¹¹⁶

It could be argued that the recent uptick in the SDF's number of reserve personnel was not due to Japan's current demographic situation per se; perhaps other reasons prompted the increase (e.g., Japan's changing security environment or the 2011 Tohoku earthquake and tsunami). Nevertheless, the data suggest that Japan has maintained the SDF's manning at sufficient levels despite a shrinking recruitment pool in part because of the military's recruitment policies. Policy changes might also be playing a role. Unlike active personnel, reserve personnel must balance their civilian work schedules to participate in periodic SDF training and exercises.¹¹⁷ The availability of the reserve personnel depends on the civilian employers' cooperation with the SDF. In 2017, to help encourage this, the MOD began providing schedules for periodic SDF training and exercises to employers ahead of time.¹¹⁸ By the following year, the MOD even began

¹¹⁶ Adapted from "Asia and Australasia," *The Military Balance* 80, no. 1 (January 1980); "Asia and Australasia," *The Military Balance* 85, no. 1 (January 1985); "Asia and Australasia," *The Military Balance* 90, no. 1 (January 1990); "East Asia and Australasia," *The Military Balance* 95, no. 1 (January 1995); "East Asia and Australasia," *The Military Balance* 100, no. 1 (January 2000); "East Asia and Australasia," *The Military Balance* 105, no. 1 (January 2005); "Chapter Eight: East Asia and Australasia," *The Military Balance* 110, no. 1 (February 2010); "Chapter Six: Asia," *The Military Balance* 115, no. 1 (January 2015); "Chapter Six: Asia," *The Military Balance* 118, no. 1 (January 2018).

¹¹⁷ Ministry of Defense, *Defense of Japan 2019*.

¹¹⁸ Ministry of Defense.

providing special subsidies to civilian employers as compensation if either the reserve personnel employees (1) responded to a defense call-up order or other orders or (2) left their civilian work due to injuries sustained from SDF duties.¹¹⁹

c. Female Personnel

The third method of maintaining staffing rates and overall force sizes amid population decline might be to increase the recruitment of female personnel. That is, to expand the de facto recruitment pool more closely to match the official recruitment pool, which is defined only by age, not gender. It should also be noted that the SDF has suffered twice from a shortage of male applicants in particular during the Japanese economic miracle (though this trend does not depart greatly from overall applicant patterns, given the preponderance of males among applicants). The first shortage of male applicants occurred during the economic growth era of the late 1960s to the early 1970s.¹²⁰ The second shortage of male recruits occurred during the bubble economy era of the late 1980s to the early 1990s.¹²¹

The SDF has been employing female personnel since its establishment in 1954.¹²² However, Sabine Frühstück stresses that

[t]he integration of women into the Self-Defense Forces has been a strictly regulated process. Unilaterally driven by the needs of the military rather than by attempts to create equal career opportunities for women, the hesitant integration of women has proceeded with narrow limits that are informed as much by the slow transformation of gender relations in Japanese society at large as by the necessities of legitimization specific to the armed forces.¹²³

¹¹⁹ Ministry of Defense.

¹²⁰ Fumika Sato, "A Camouflaged Military: Japan's Self-Defense Forces and Globalized Gender Mainstreaming—カモフラージュされた軍隊—日本の自衛隊とグローバルなジェンダー主流化," *The Asia-Pacific Journal* 10, no. 36 (August 2012): 7.

¹²¹ Sato: 9.

¹²² Ministry of Defense, *Defense of Japan 2018*.

¹²³ Sabine Frühstück, *Uneasy Warriors: Gender, Memory, and Popular Culture in the Japanese Army* (Berkeley, CA: University of California Press, 2007), 87.

Accordingly, female personnel were initially limited to nursing jobs.¹²⁴ As the number of female personnel expanded, so, too, did the number and types of jobs that they could perform. Frühstück states that clerical positions became available to female personnel “in the GSDF in 1967, and in both the MSDF and the ASDF in 1974.”¹²⁵ More substantial changes came about in the 1980s. In 1986, the MOD implemented the Equal Employment Opportunity Law.¹²⁶ Consequently, most positions in the SDF became available to female personnel. In fact, Sato claims that “[t]he percentage of SDF jobs open to women reached 75 percent, up from 39 percent.”¹²⁷ Furthermore, by 2017, the MOD implemented the “Initiative to Promote Active Participation of Female SDF Personnel – Aiming for Attractive SDF that Adapts to the Times and Environment.”¹²⁸ Consequently, virtually all positions in the SDF became available to female personnel (excluding positions in the GSDF’s Nuclear Biological Chemical [NBC] Weapon Defense Units and Tunnel Company Units due to maternity protection).¹²⁹ Kyodo states that “[a] growing number of women in Japan’s Self-Defense Forces are entering formerly male-dominated fields, with one recently becoming the country’s first-ever female fighter pilot.”¹³⁰

Although the SDF has been employing female personnel since its establishment, the increasing number of female personnel over the last two decades has been significant—though the absolute size of this increase is modest in comparison to the size of the overall force, even more than it has been the case with reserve personnel. In 2000, the SDF’s number of female personnel was 9,874 people, or 4.16 percent of the total SDF (Figure

¹²⁴ Fumika Sato, “A Camouflaged Military: Japan’s Self-Defense Forces and Globalized Gender Mainstreaming—カモフラージュされた軍隊—日本の自衛隊とグローバルなジェンダー主流化,” *The Asia-Pacific Journal* 10, no. 36 (August 2012): 4.

¹²⁵ Frühstück, 88.

¹²⁶ Sato.

¹²⁷ Sato.

¹²⁸ Ministry of Defense, *Defense of Japan 2018*.

¹²⁹ Ministry of Defense, *Defense of Japan 2019*.

¹³⁰ “Women Taking on More Frontline Roles in Japan’s Self-Defense Forces,” *Kyodo*, October 14, 2018, <https://english.kyodonews.net/news/2018/10/7eca2543f9e6-feature-women-taking-on-more-frontline-roles-in-japans-self-defense-forces.html>.

19).¹³¹ In 2010, that number was 11,814 people, or 5.15 percent.¹³² By 2018, the SDF’s number of female personnel increased to 14,686 people, or 6.47 percent—an increase of roughly 50 percent in terms of absolute recruitment numbers, but only a small percentage-point increase and a still-minor share of the size of the overall force.¹³³ According to the *Defense of Japan 2019*, though, the MOD further plans to “increase the proportion of female SDF personnel among total SDF personnel to over 9% by FY2027.”¹³⁴ The increasing number of female personnel has, at least recently, made some contribution to sustaining the SDF’s staffing, enough so that the MOD is willing to continue its implementation.

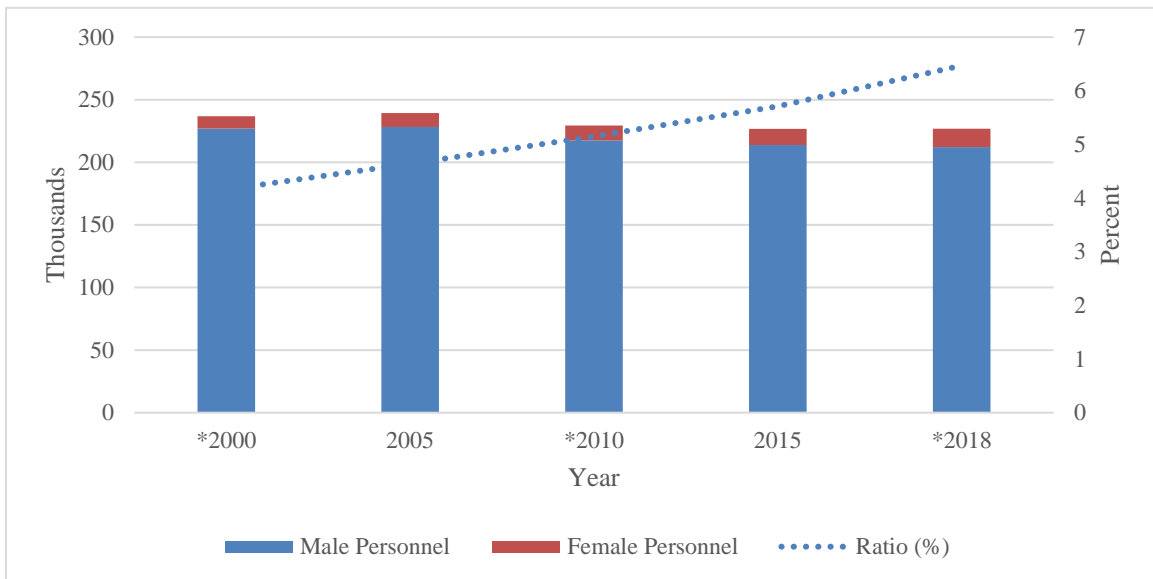


Figure 19. The SDF’s Female Personnel: 2000–2018¹³⁵

¹³¹ Ministry of Defense, *Defense of Japan 2000*.

¹³² Ministry of Defense, *Defense of Japan 2010*.

¹³³ Ministry of Defense, *Defense of Japan 2015*.

¹³⁴ Ministry of Defense, *Defense of Japan 2019*.

¹³⁵ Total size of bar equates to total personnel. Adapted from Ministry of Defense, *Defense of Japan 2000*; *Defense of Japan 2005*; *Defense of Japan 2010*; *Defense of Japan 2015*; *Defense of Japan 2018*.

d. Maximum Age Limit and Retirement Age

The fourth method of maintaining staffing rates and overall force sizes amid population decline might be to manipulate age requirements: expanding the size of the overall recruitment pool itself by raising the maximum age of new recruits, and/or extending the SDF members' time in service by raising the retirement age.

In 2017, the initial recruitment ages for active personnel, SDF Reserve Personnel, and SDF Ready Reserve Personnel were between 18 to 26, 18 to 36, and 18 to 31, respectively.¹³⁶ By the following year, the *Defense of Japan 2019* stated that the maximum age limit for active personnel was raised from ages 26 to 32 “in October 2018 in order to secure diverse human resources from a broader range, including people with work experiences in private companies.”¹³⁷ During that same year, the maximum age limits for SDF Reserve Personnel and SDF Ready Reserve Personnel were raised from ages 36 to 54 and ages 31 to 49, respectively.¹³⁸ Although this policy change is too recent to offer any evidence of impact, there is reason to think this policy change will prove durable. At a minimum, it could be argued that raising the maximum age limit and/or retirement age will more than likely help sustain the SDF's *future* manning at sufficient levels despite a shrinking recruitment pool. But this also implies that the SDF has accomplished its force-size maintenance thus far without manipulation of recruitment policies with regard to initial recruitment age.

Retirement-age extensions have been used somewhat more steadily to help increase the size of the overall force. The SDF's retirement ages for active personnel are now between 53 to 60, depending on one's rank.¹³⁹ However, the *Defense of Japan 2019* stresses that

[w]hile ensuring the robustness of the SDF, the NDPG and others plan to raise the mandatory early retirement age by one year during the period of the MTDP from 2020, and another one year during the period of the next

¹³⁶ Ministry of Defense, *Defense of Japan 2019*.

¹³⁷ Ministry of Defense.

¹³⁸ Ministry of Defense.

¹³⁹ Ministry of Defense.

MTDP in stages for each rank in order to ensure further utilization of older human resources who have rich knowledge, skills, and experience.¹⁴⁰

It should be noted, though, the SDF *already* has a high and increasing average personnel age, partly reflecting past retirement-age policy. In 1990, the SDF's average personnel age was 31.8.¹⁴¹ By 2011, this number was 35.6.¹⁴² In other words, the SDF's average personnel age increased by 3.8 years over the span of 21 years.

One sign of this is differential staffing rates among the SDF's four broad rank groups: (1) the officer corps, (2) the warrant officer corps, (3) the enlisted upper corps, and (4) the enlisted lower corps. Among these four groups, the enlisted lower corps staffing rate has remained consistently low, roughly between 65 and 85 percent (Figure 20).¹⁴³ Like in any other military, the enlisted upper and lower corps consists mostly of more-recent high school graduates. Therefore, as the enlisted lower staffing rate remains consistently low, the SDF's average personnel age remains consistently high.

¹⁴⁰ Ministry of Defense.

¹⁴¹ Ministry of Defense, *Defense of Japan 2012* (Tokyo: Japan Ministry of Defense, 2012), https://www.mod.go.jp/e/publ/w_paper/2012.html.

¹⁴² Ministry of Defense.

¹⁴³ Ministry of Defense, *Defense of Japan 1980*.

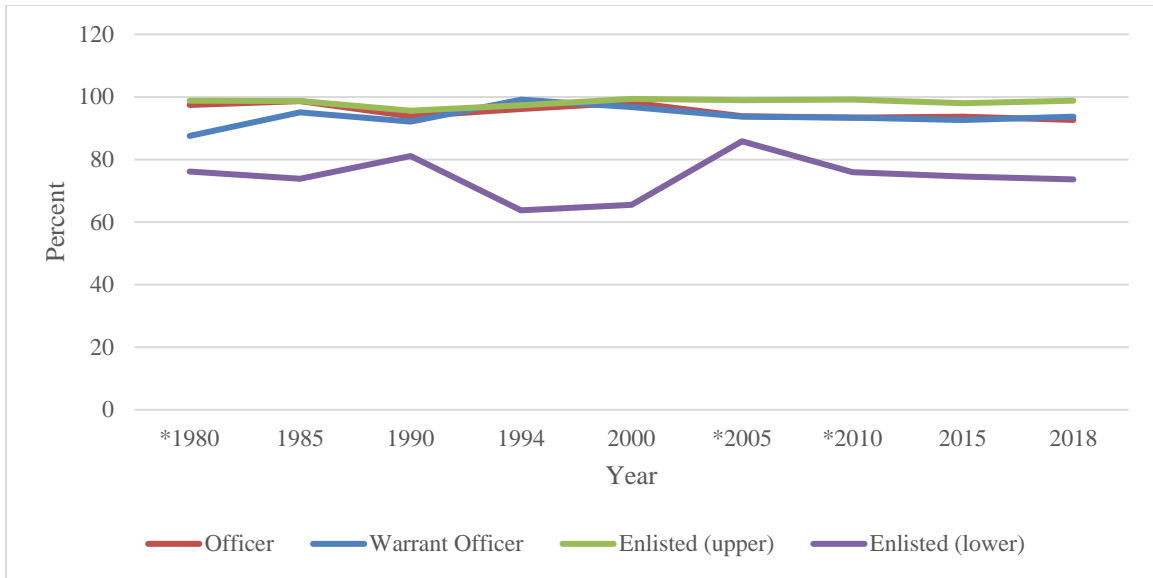


Figure 20. The SDF's Staffing Rate by Rank: 1980–2018¹⁴⁴

In 2010, “Japan’s Visions for Future Security and Defense Capabilities in the New Era: Toward a Peace-Creating Nation” stated that

[...]the average age of SDF members, in particular commissioned officers, including junior officers, who lead front-line units, is higher than that of officers in the military forces of the U.S., UK, and other countries. This is due to the extension of the retirement age, the promotion of NCOs to commissioned officer to a later stage in personnel career and other measures. The SDF is, in fact, getting older across the board.¹⁴⁵

By 2012, the *Defense of Japan 2012* added that “since FY2011, efforts have been made to curb the promotion of officers, warrant officers and sergeants in order to increase the number of privates and to adjust the rank and age structure of existing personnel.”¹⁴⁶

In addition, unlike the United States armed forces, the SDF lacks an “up-or-out” promotion policy. Essentially, the “up-or-out” promotion policy manages the military’s

¹⁴⁴ Adapted from Ministry of Defense, *Defense of Japan 1980; Defense of Japan 1985; Defense of Japan 1990; Defense of Japan 1994; Defense of Japan 2000; Defense of Japan 2005; Defense of Japan 2010; Defense of Japan 2015; Defense of Japan 2018*.

¹⁴⁵ Council on Security and Defense Capabilities, “Japan’s Visions for Future Security and Defense Capabilities in the New Era: Toward a Peace-Creating Nation,” Prime Minister’s Office of Japan, 2010, https://www.kantei.go.jp/jp/singi/shin-ampobouei2010/houkokusyo_e.pdf.

¹⁴⁶ Ministry of Defense, *Defense of Japan 2012*.

size and age structure by increasing the attrition rate.¹⁴⁷ Because the SDF lacks the “up-or-out” promotion policy, older personnel fill the junior ranks (typically younger personnel fill the junior ranks). Simultaneously, this means that the SDF’s demand for recruits has been *artificially* low. Yoshihara echoes similar concerns by arguing that “[t]he luxury to retain junior officers for two or three decades substantially reduces the strain to refill the billets of lower ranks.”¹⁴⁸ Therefore, hypothetically, even if the SDF implemented an “up-or-out” promotion policy, its high average personnel age might decrease, but in exchange, its demand for recruits might increase. To further exacerbate the situation, Williams states that “shedding older or higher-ranking members risks leaving too few experienced people to train incoming cohorts.”¹⁴⁹

Of course, this is irrelevant and untroubling if we are concerned with the narrow metrics of staffing rate and overall force size for their own sakes. However, to the extent that a high average personnel age implies less military effectiveness (vice, say, something more beneficial, like greater experience), maintaining personnel numbers in a way that involves higher average personnel ages could imply an erosion of military effectiveness in the future. As Quester writes, “Some military tasks demand the stamina of youth, as generally one cannot be effective in direct combat at the age of 45; if military personnel all served to the age of 65, most of such people might not have any useful role.”¹⁵⁰

To this end, the *Defense of Japan 2012* stated that “since FY2011, efforts have been made to curb the promotion of officers, warrant officers and sergeants in order to increase the number of privates and to adjust the rank and age structure of existing personnel.”¹⁵¹ This also suggests that maintenance of staffing rates and overall force sizes to date might

¹⁴⁷ Cindy Williams, “Introduction,” in *Filling the Ranks: Transforming the U.S. Military Personnel System* (Cambridge, MA: MIT Press, 2004), 17.

¹⁴⁸ Toshi Yoshihara, “The Setting Sun? Strategic Implications of Japan’s Demographic Transition,” in *Population Decline and the Remaking of Great Power Politics* (Washington, DC: Potomac Books, 2012), 147.

¹⁴⁹ Cindy Williams, “Introduction,” in *Service to Country: Personnel Policy and the Transformation of Western Militaries* (Cambridge, MA: MIT Press, 2006), 12–13.

¹⁵⁰ George H. Quester, “Demographic Trends and Military Recruitment: Surprising Possibilities,” *Parameters* 35, no. 1 (Spring 2005): 28.

¹⁵¹ Ministry of Defense, *Defense of Japan 2012*.

have already come at some cost of effectiveness, all else equal, since these metrics do not account for average personnel age. That said, again, assessing such all-else-equal effects is beyond the scope of this research. Meanwhile, at a broader level, the SDF's military effectiveness is not thought to have visibly declined during these years of increasing average personnel age, which allows some confidence that staffing and force size metrics are not fundamentally unsound proxies for effectiveness. Given this, the SDF has more than likely allowed its demand for recruits to remain below the 100 percent level because it cannot afford to exchange experienced older personnel for unexperienced younger personnel. It could also be argued that the SDF's high average personnel age is not a major concern because it is more than likely heading in a more capital-intensive direction, as noted below.

e. Public Relations

The fifth method of maintaining staffing rates and overall force sizes amid population decline might be to increase applicant quantity and quality by improving the military's public relations effort. Eldridge states that

[...]the main reason for the lack of popularity [of the SDF] as a career has tended to be the inability of the Ministry of Defense (and predecessor Defense Agency before 2007) to compete with the private sector when hiring, especially when the economy is strong and jobs are plentiful. Lower salaries are one reason, but the physically demanding and mentally challenging work of those in the military are another.¹⁵²

It could be argued that this competition is observed in most developed countries that implement an all-volunteer force. For example, St. Denis states that “[t]he reasons for this are multiple, but two stand out: increasing levels of education, and a growing separation of people, not only from the military (in terms of values and ideals), but also from national institutions in general (in terms of social identity).”¹⁵³ Discouraging higher education is challenging in a highly-educated country like Japan, but improving the military's public

¹⁵² Robert D. Eldridge, “Japan's Changing Demographics and the Impact on its Military,” *Education About Asia* 22, no. 3 (Winter 2017): 28.

¹⁵³ Tom St. Denis, “Future Soldiers: ‘The Few ...’ Military Personnel Trends in the Developed World,” *Canadian Military Journal* 15, no. 4 (Autumn 2015): 14–15.

relations effort is manageable. According to Williams, “Most militaries are working to boost recruitment capacity through professional recruiting teams, mass-media advertising, and other measures.”¹⁵⁴ Japan is no exception.

During most of the post-World War II period, the SDF kept a low profile. This resulted in the Japanese public’s minimal exposure to the SDF. However, the Gulf War served as a catalyst for change in the SDF’s public relations effort. Frühstück states that “[i]nternational and particularly U.S. criticism of Japan during the Gulf War in 1990–91 for providing enormous financial support but no soldiers triggered new aggressive efforts of self-presentation to increase the Self-Defense Forces’ legitimacy and public approval in Japan and abroad.”¹⁵⁵ In other words, in 1992, the SDF shifted from a passive to an aggressive public relations strategy. By the following year, the SDF even established a Department of Public Relations within its Division of Personnel Training.¹⁵⁶ However, Frühstück stresses that

promotions from the Self-Defense Forces rely primarily on vague slogans; a decisively nonviolent symbolism; an unambiguously gendered imagery; a glaring absence of the references to the nation, patriotism, or other concepts once exploited by the Japanese state; and frequent use and appropriations of English phrases.¹⁵⁷

Accordingly, the SDF’s public relations effort was initially ineffective, sending contradictory messages to the Japanese public. The SDF’s public relations effort, on the one hand, advertised its capability but, on the other hand, camouflaged its potential for violence. She further adds that the MOD has “symbolically ‘disarmed’ the Self-Defense Forces; normalized and domesticated the military to look like other (formerly) state-run service organizations such as the railway and postal systems.”¹⁵⁸

¹⁵⁴ Williams, “Introduction,” *Service to Country*, 23.

¹⁵⁵ Sabine Frühstück, *Uneasy Warriors: Gender, Memory, and Popular Culture in the Japanese Army* (Berkeley, CA: University of California Press, 2007), 118.

¹⁵⁶ Frühstück.

¹⁵⁷ Frühstück, 122.

¹⁵⁸ Frühstück, 117.

Eventually, substantial changes came about in the late 2010s. The SDF improved its public relations effort in two ways: (1) the incorporation of the internet and (2) the creation of recruitment advertising videos. In 2016, the *Defense Programs and Budget of Japan: Overview of FY2016 Budget* stated that the SDF invested ¥200 million to improve “SDF recruitment functions.”¹⁵⁹ Although SDF investment in public relations is nothing new, its heavy emphasis on (i.e., funding for) internet initiatives is a recent development. Specifically, to streamline the application process, the SDF implemented “a system enabling the acceptance of applications for recruitment examinations for SDF personnel, etc., via the Internet.”¹⁶⁰ By the following year, the *Defense Programs and Budget of Japan: Overview of FY2017 Budget* stated that the SDF invested ¥800 million to improve “advertisement and readiness for recruitment to deal with the increasingly severe recruitment environment” and ¥150 million to “[c]reate video contents for advertisement for recruitment.”¹⁶¹ Specifically, to improve its public relations effort, the SDF created

video contents for advertisement for recruitment, by effectively combining TV commercial [*sic*], which is widely prevalent among the audience without being influenced by their preference, and web video, which can easily spread regardless of place or time, and by taking advantage of each strength.¹⁶²

Accordingly, Reuters stated that both the incorporation of the internet and the creation of recruitment advertising videos “resulted in a three-fold increase in visits to its recruiting homepage.”¹⁶³ Although this most recent policy change is too recent to offer any evidence of impact, there is reason to think this policy change will prove durable. At a minimum, it

¹⁵⁹ Ministry of Defense, *Defense Programs and Budget of Japan: Overview of FY2016 Budget* (Tokyo: Japan Ministry of Defense, 2015), https://www.mod.go.jp/e/d_act/d_budget/pdf/280330.pdf.

¹⁶⁰ Ministry of Defense.

¹⁶¹ Ministry of Defense, *Defense Programs and Budget of Japan: Overview of FY2017 Budget* (Tokyo: Japan Ministry of Defense, 2016), https://www.mod.go.jp/e/d_act/d_budget/pdf/290328.pdf.

¹⁶² Ministry of Defense.

¹⁶³ Linda Sieg and Ami Miyazaki, “Aging Japan: Military Recruiters Struggle as Applicant Pool Dries Up,” *Reuters*, September 19, 2018, <https://www.reuters.com/article/us-japan-ageing-military-recruits/aging-japan-military-recruiters-struggle-as-applicant-pool-dries-up-idUSKCN1LZ14S>.

could be argued that improving the military's public relations effort will more than likely help sustain the SDF's *future* manning at sufficient levels despite a shrinking recruitment pool.

2. Capital Intensity

As noted in Chapter I, to the extent population decline *does* have a negative impact on military manpower, and/or if manpower requirements increase along with expanded missions sets, this can be mitigated by increasing capital intensity to compensate for military manpower. In fact, Yoshihara claims that “technology would enable the SDF to do more with the same or, perhaps, with less.”¹⁶⁴ Japan's defense spending is divided into two categories: (1) personnel and provisions expenses and (2) material expenses. Capital intensity is calculated by dividing material expenses by personnel expenses.¹⁶⁵ Ono adds that “[b]y 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.”¹⁶⁶ In FY1980, the SDF's capital intensity ratio was 1.02 (Figure 21).¹⁶⁷ In FY1990, this number had peaked at 1.49.¹⁶⁸ By FY2000, the SDF's capital intensity ratio dropped to 1.23, and it has held steady at roughly the same level since.¹⁶⁹

¹⁶⁴ Toshi Yoshihara, “The Setting Sun? Strategic Implications of Japan's Demographic Transition,” in *Population Decline and the Remaking of Great Power Politics* (Washington, DC: Potomac Books, 2012), 151.

¹⁶⁵ Keishi Ono, “Demographics and Security: Defense Capabilities Building and Economic Hegemony towards the 22nd Century,” *NIDS Journal of Defense and Security*, no. 18 (December 2017): 45.

¹⁶⁶ Ono, 45.

¹⁶⁷ Ministry of Defense, *Defense of Japan 1980*.

¹⁶⁸ Ministry of Defense, *Defense of Japan 1990*.

¹⁶⁹ Ministry of Defense, *Defense Programs and Budget of Japan: Overview of FY2000 Budget* (Tokyo: Japan Ministry of Defense, 1999), https://www.mod.go.jp/j/yosan/yosan_gaiyo/2000/y2000.pdf.

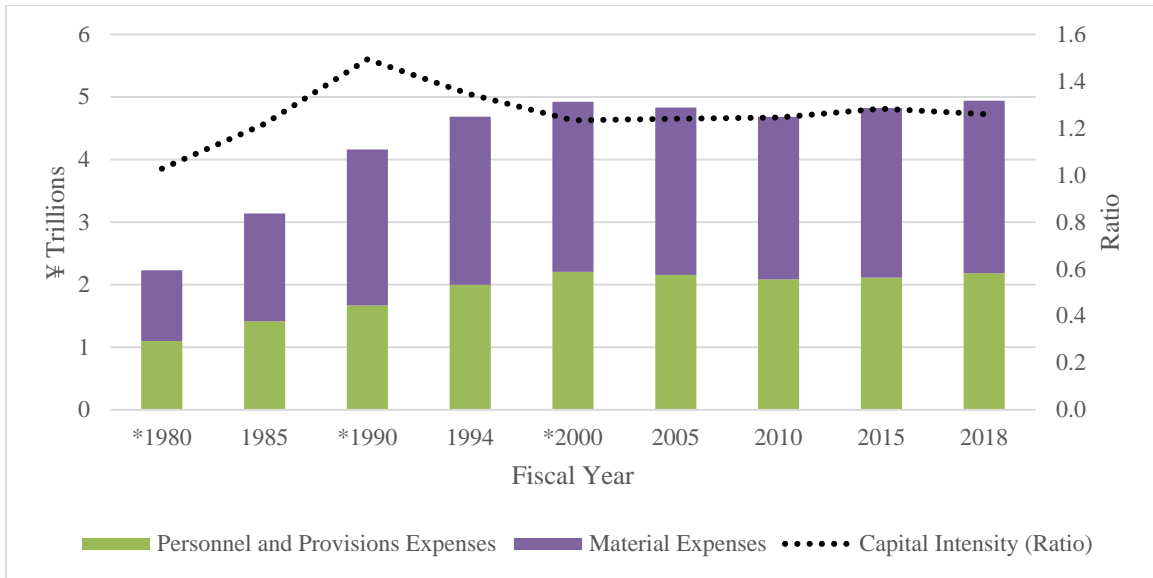


Figure 21. Japan's Capital Intensity: FY1980–2018¹⁷⁰

The data suggest that Japan is currently not using capital intensity to compensate for military manpower despite (1) a shrinking recruitment pool and (2) being a technologically driven country (Figure 22). Perhaps this is possible because the SDF has more than enough applicants to maintain its historical 90 percent staffing rate, and could even achieve a 100 percent staffing rate if it so chose. Ono echoes similar concerns by arguing that “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” (emphasis added).¹⁷¹

¹⁷⁰ Total size of bar equates to total expenses. Adapted from Ministry of Defense, *Defense of Japan 1980; Defense of Japan 1985; Defense of Japan 1990; Defense of Japan 1994; Defense of Japan 2000; Defense of Japan 2005; Defense of Japan 2010; Defense of Japan 2015; Defense of Japan 2018.*

¹⁷¹ Ono, “Demographics and Security,” 45.

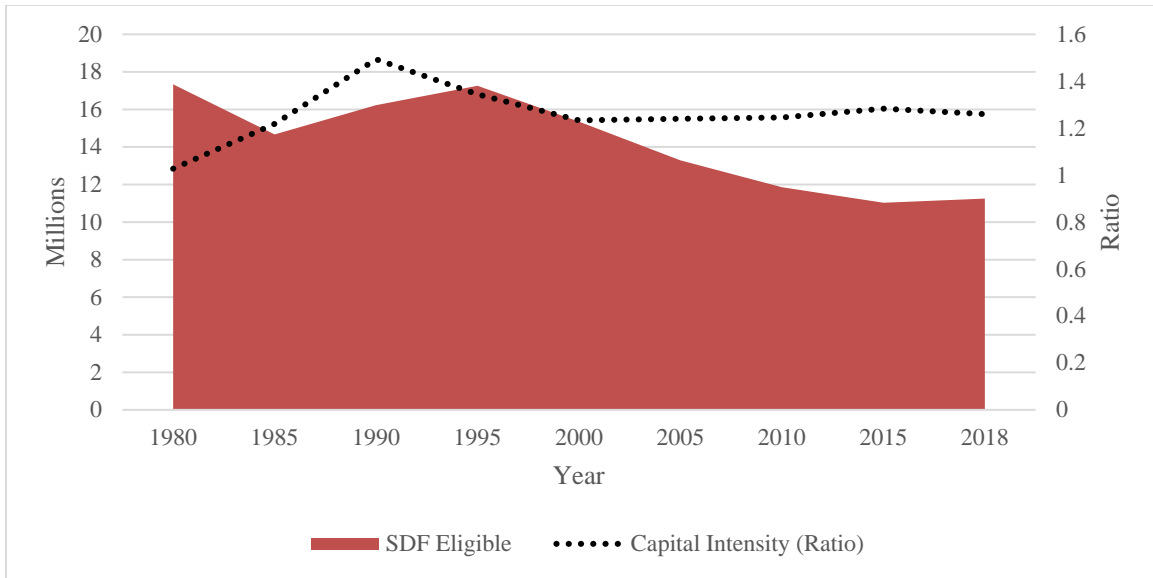


Figure 22. The SDF's Recruitment Pool vs. Japan's Capital Intensity: 1980–2018¹⁷²

C. SUMMARY

This chapter analyzed the popular conventional wisdom—a country's population size is positively correlated with its ability to staff its military—and its application to Japan. The first section identified the yardstick used to measure the direct constraints of population on military manpower: the SDF's staffing rate and authorized strength. The second section examined the two main types of methods Japan has most likely used to avoid the direct constraints of population on military manpower: (1) recruitment policies and (2) capital intensity. Japan has undertaken a number of different efforts. Public relations and retirement-age extensions seem to have been most actively applied. Efforts to increase the number of female personnel, while successful in terms of percentage increases in absolute recruitment numbers, have only modestly contributed to shoring up the size of the overall force. Meanwhile, tools such as increasing reserve numbers, lowering

¹⁷² Adapted from Ministry of Defense, *Defense of Japan 1980*; *Defense of Japan 1985*; *Defense of Japan 1990*; *Defense of Japan 1994*; *Defense of Japan 2000*; *Defense of Japan 2005*; *Defense of Japan 2010*; *Defense of Japan 2015*; *Defense of Japan 2018*; Ministry of Internal Affairs and Communications, "Population by Age (from 1920 to 2000)"; Ministry of Internal Affairs and Communications, "Population by Age (from 2000 to 2015)"; Ministry of Internal Affairs and Communications, "Population and Percentage Distribution by Age."

military recruitment standards, and increasing capital intensity seem not to have been used, as these have all remained roughly constant even as Japan's population has declined. Most important is the central finding that Japan, in the first place, has maintained the SDF's staffing rate and authorized strength at consistent (and arguably sufficient) levels despite a shrinking recruitment pool. The SDF's applicant surplus has remained large—large enough even to achieve a 100 percent staffing rate if the SDF were to seek this.

IV. INDIRECT CONSTRAINTS ON MILITARY FUNDING

This chapter analyzes the popular conventional wisdom—a country’s population size affects its ability to staff and fund its military—and its application to Japan. Specifically, this chapter explores whether population decline has a negative impact on military funding (i.e., poses an indirect constraint), either by deprioritizing defense spending or decreasing the size of the entire economy. The first section identifies the yardstick used to measure the indirect constraints on military funding: Japan’s defense spending. The second section examines the main method Japan has most likely used to avoid the indirect constraints on military funding: deficit spending. This chapter finds that Japan has maintained the SDF’s expenditure at sufficient levels despite negative social security and GDP impact. This is possible because Japan’s defense spending has been compensated with increasing deficit spending to maintain its historical one-percent of GDP defense budget (and because Japan’s low one-percent cap makes it easier to justify and maintain status-quo defense spending).

A. JAPAN’S SOCIAL SECURITY SPENDING AND GDP GROWTH

As noted in Chapter I, the second concern with population aging and decline, after the potential to starve the military of recruits, is the potential to starve the military of needed funds in relative and absolute terms. The first problem is that military funding is vulnerable to the crowding-out effect: social security superseding defense spending. Furthermore, the severity of the crowding-out effect depends on the size of the old-age group (aged 65 and older). As the old-age group expands, so, too, will social security spending, ultimately crowding out defense spending. Simply put, social security spending and defense spending may have an inverse relationship. Ogawa states that “[p]opulation aging has already imposed considerable financial pressures on Japan’s social security system, and these pressures are expected to grow at an alarming rate in the years ahead.”¹⁷³ To further exacerbate the situation, as Brooks, Brooks, Greenhill, and Haas write, “Old societies are

¹⁷³ Naohiro Ogawa, “Population Aging and Immigration in Japan,” *Asian and Pacific Migration Journal* 20, no. 2 (June 2011): 134.

likely to experience significant strain on their finances, and thus the ability to secure funds for military spending, even before their working-age bulges disappear.”¹⁷⁴ In FY1980, Japan’s social security spending was ¥8.17 trillion, or 18.82 percent of the total government spending (Figure 23).¹⁷⁵ In FY1990, this number was ¥11.48 trillion, or 16.57 percent.¹⁷⁶ By 1995, Japan’s social security spending increased to ¥14.54 trillion (19.15 percent), and it has continued to increase since.¹⁷⁷

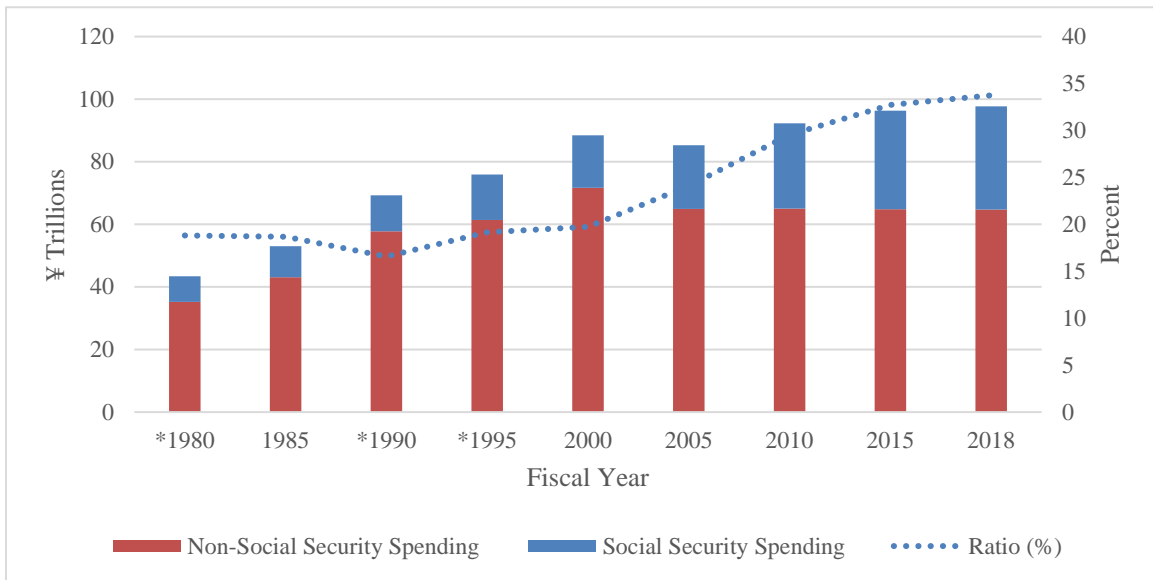


Figure 23. Japan’s Social Security Spending: FY1980–2018¹⁷⁸

The second potential problem is that military funding is vulnerable to slow economic growth, which might, in turn, depend on the size and productivity of the working-age group (aged 15 to 64). Therefore, as the working-age group shrinks, so, too, might

¹⁷⁴ Deborah Jordan Brooks et al., “The Demographic Transition Theory of War: Why Young Societies Are Conflict Prone and Old Societies Are the Most Peaceful,” *International Security* 43, no. 3 (Winter 2018): 68.

¹⁷⁵ Ministry of Finance, *General Account Expenditures by Function* (Tokyo: Japan Ministry of Finance, 2010), https://www.mof.go.jp/english/budget/statistics/201006/s201006_03a.pdf.

¹⁷⁶ Ministry of Finance.

¹⁷⁷ Ministry of Finance.

¹⁷⁸ Adapted from Ministry of Finance; total size of bar equates to total government spending.

economic growth (unless productivity increases to levels that compensate for the shortage of workers). The *OECD Territorial Reviews: Japan 2016*, meanwhile, stresses that

Japan’s productivity performance has been relatively poor since the early 1990s. Over the last decade, it has improved relative to other OECD economies, but this has been insufficient to offset the impact of demographic change.¹⁷⁹

In FY1985, Japan’s GDP growth had peaked at 5.23 percent (Figure 24).¹⁸⁰ In FY2005, this number dropped to 1.66 percent.¹⁸¹ By 2010, Japan’s GDP growth recovered to 4.19 percent, but it has since returned to its prior downward trend.¹⁸²

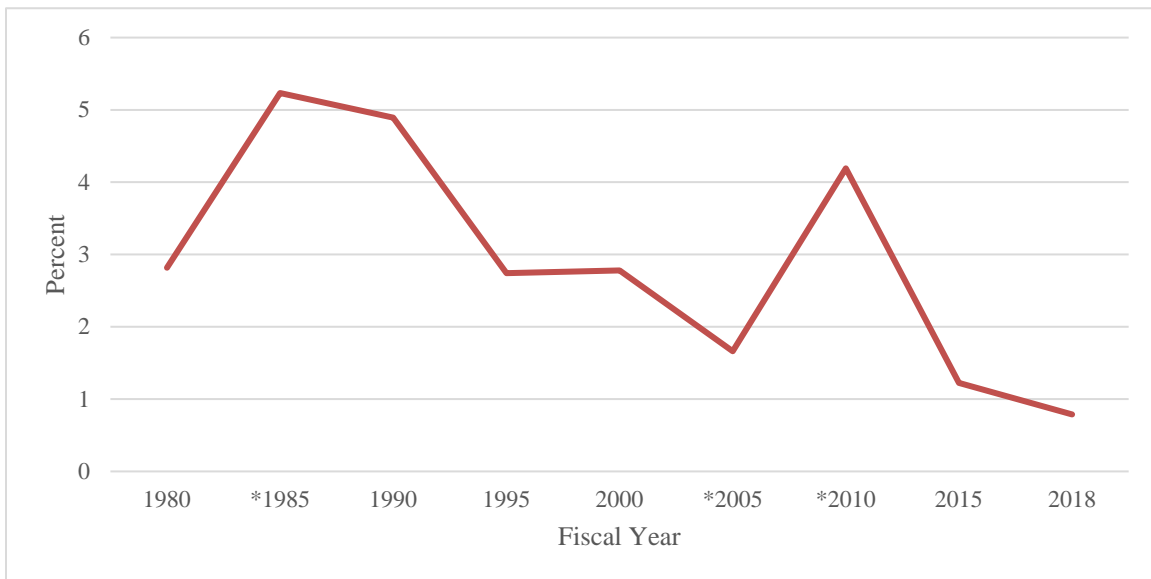


Figure 24. Japan’s GDP Growth: FY1980–2018¹⁸³

¹⁷⁹ OECD, *OECD Territorial Reviews: Japan 2016* (Paris: OECD Publishing, 2016), 16.

¹⁸⁰ World Bank, “GDP Growth (Annual %) - Japan,” accessed January 10, 2020, <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=JP>.

¹⁸¹ World Bank.

¹⁸² World Bank.

¹⁸³ Adapted from World Bank.

As an aside connecting military manpower (as opposed to military funding) to economic growth, it could also be argued that the applicant pool should increase when the economy is underperforming, since steady government work should be more attractive compared to the unpredictable private sector. However, as noted above, while the SDF's number of applicants did rise to higher levels for roughly ten years from the mid-1990s, it has since returned to pre-population-decline levels despite even lower economic growth (Figure 25).

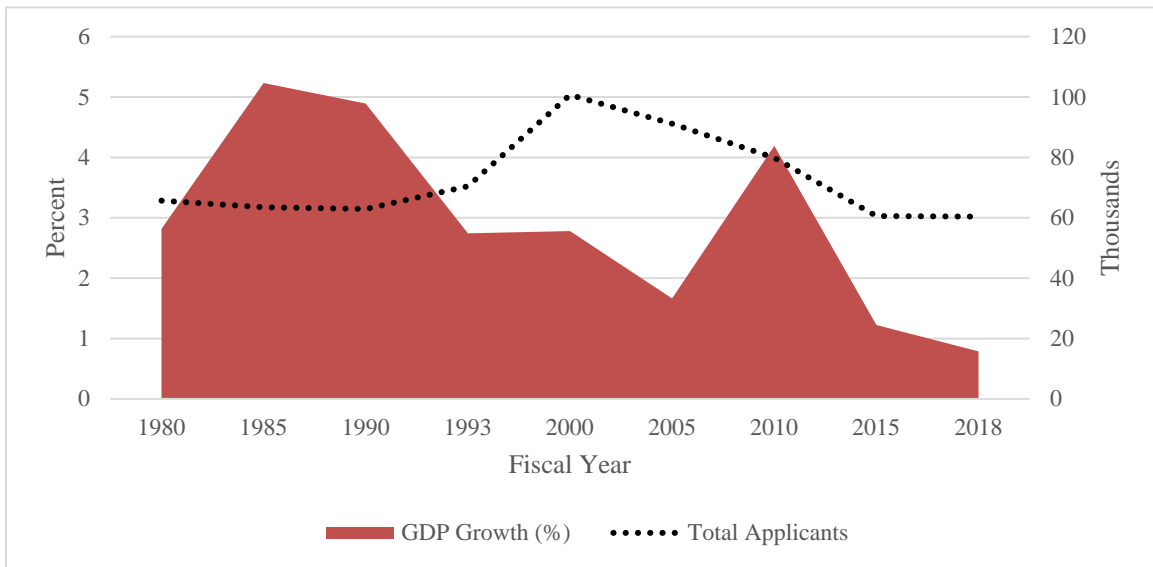


Figure 25. Japan's GDP Growth vs. the SDF's Number of Applicants: FY1980–2018¹⁸⁴

Japan's defense spending is the most efficient measure of the indirect constraints on military funding. Sciubba states that countries increase their defense spending because "[w]ithout adequate funding, states can neither train and equip soldiers nor compensate for a lack of soldiers through technology."¹⁸⁵ Japan has continued to adhere to its one-percent of GDP defense budget restriction. Former Prime Minister Takeo Miki implemented this

¹⁸⁴ Adapted from Ministry of Defense, *Defense of Japan 1980; Defense of Japan 1985; Defense of Japan 1990; Defense of Japan 1994; Defense of Japan 2000; Defense of Japan 2005; Defense of Japan 2010; Defense of Japan 2015; Defense of Japan 2018*; World Bank, "GDP Growth (Annual %) - Japan."

¹⁸⁵ Sciubba, *The Future Faces of War*, 52.

self-imposed limit in 1976, which kept Japan’s defense spending large enough, on the one hand, to increase the SDF’s effectiveness while, on the other hand, small enough not to provoke fears of Japan’s remilitarization among such neighbors as China and South Korea. In FY1980, Japan’s defense spending was ¥2.24 trillion, or 5.18 percent of total government spending (Figure 26).¹⁸⁶ In FY2000, this number was 4.9 trillion, or 5.49 percent.¹⁸⁷ By FY2010, Japan’s defense spending dropped to ¥4.79 trillion, or 5.19 percent. In absolute terms, it has increased since then, but in relative terms, it has remained fairly constant.

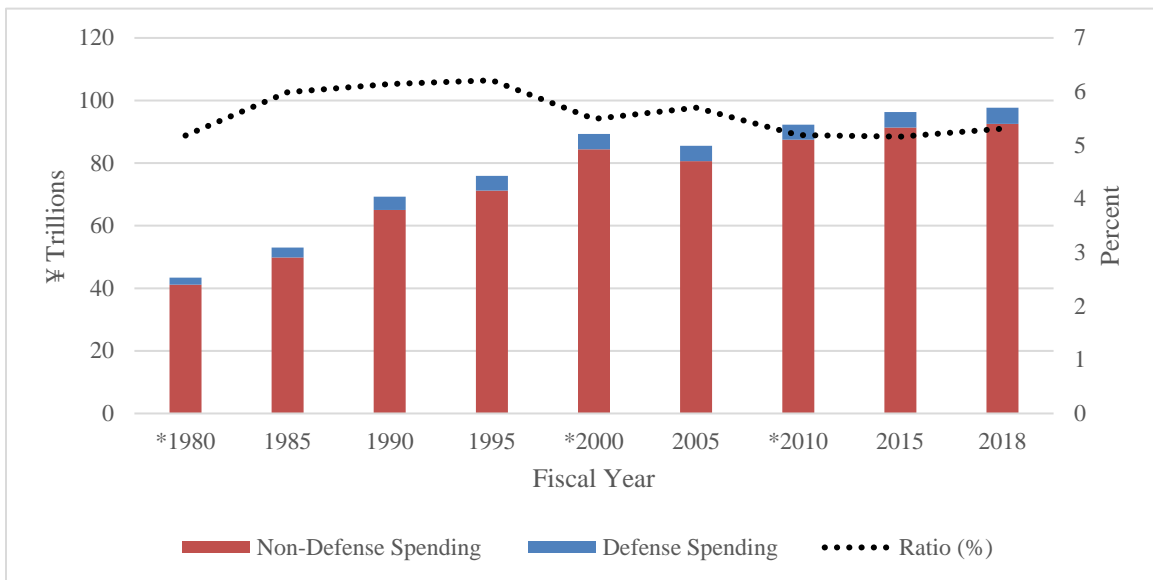


Figure 26. Japan’s Defense Spending: FY1980–2018¹⁸⁸

¹⁸⁶ Ministry of Finance, *General Account Expenditures by Function*.

¹⁸⁷ Ministry of Finance.

¹⁸⁸ Adapted from Ministry of Finance; these figures do not include SACO-related expenses; total size of bar equates to total government spending.

Therefore, contrary to the popular conventional wisdom, population decline has not coincided with a reduction in defense spending. While Japan’s social security spending has increased and its GDP growth has decreased, Japan’s defense spending has increased in absolute terms and remained fairly consistent in relative terms (Figure 27).

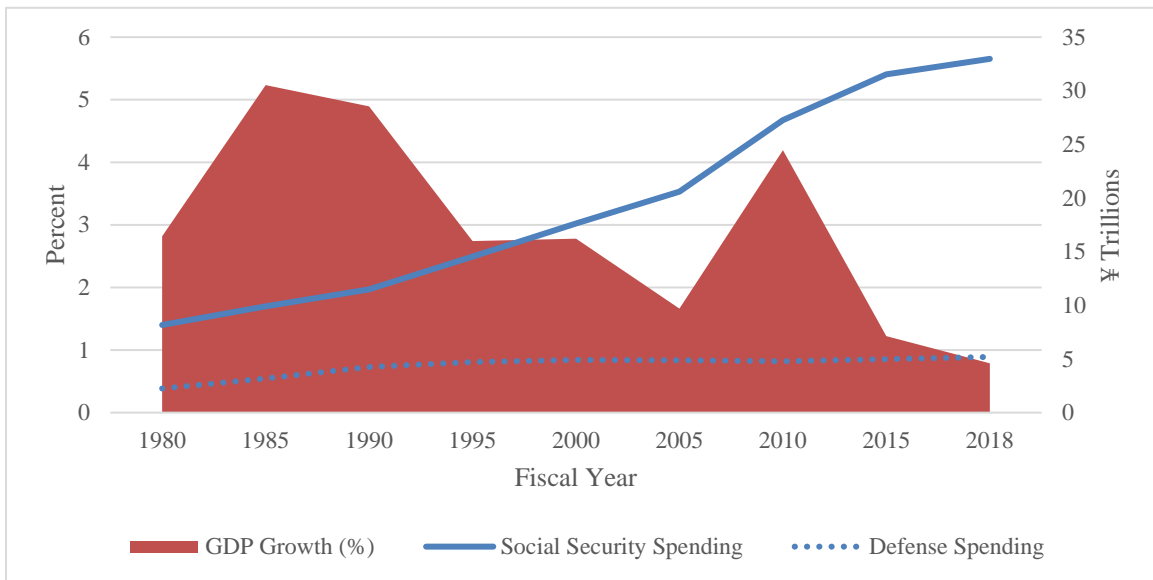


Figure 27. Japan’s Social Security Spending and GDP Growth vs. Defense Spending: FY1980–2018¹⁸⁹

B. INSULATING JAPAN’S DEFENSE SPENDING FROM NEGATIVE SOCIAL SECURITY AND GDP IMPACT

This section investigates how Japan has maintained the SDF’s expenditure at sufficient levels despite negative social security and GDP impact. It examines the main method Japan has most likely used to avoid the indirect constraints on military funding: deficit spending. To be clear, this section does not provide evidence showing that this method, and this method alone, helped Japan maintain its defense spending. Instead, this section introduces a method Japan has likely undertaken that can plausibly be thought to have helped sustain the SDF’s expenditure at consistent (and arguably sufficient) levels

¹⁸⁹ Adapted from Ministry of Finance, *General Account Expenditures by Function*; World Bank, “GDP Growth (Annual %) - Japan.”

despite its aging and declining population. It could also be argued that Japan's low one-percent cap makes spending, combined with its changing security environment, makes it easier to justify and maintain status-quo defense spending. Japan's economy is the third-largest in the world (as of 2018).¹⁹⁰ Lind argues that "[a] state with a large economy devoting only a small share of its wealth to defense can amass a high level of military power."¹⁹¹ Accordingly, Japan's defense spending is the ninth-largest in the world (as of 2018).¹⁹²

As noted in Chapter I, the negative impact of population decline on military funding can be avoided if countries can prevent (1) the crowding-out effect and/or (2) slow economic growth. Japan's total revenues are divided into three categories: (1) tax revenues, (2) other revenues, and (3) government bond issues (i.e., deficit spending). In FY1990, Japan's tax revenues had peaked at ¥60.1 trillion and its total expenditures were ¥69.26 trillion (Figure 28).¹⁹³ In FY2010, those numbers were ¥37.39 trillion and ¥92.29 trillion.¹⁹⁴ By 2015, Japan's tax revenues recovered to ¥54.52 trillion, and it has continued to increase since.¹⁹⁵ During that same year, Japan's total expenditures increased to ¥96.34 trillion, and it has continued to increase since.¹⁹⁶ Both have increased, but Japan's expenditures have clearly outpaced its tax revenues.

¹⁹⁰ World Bank, "GDP Ranking," accessed January 10, 2020, <https://datacatalog.worldbank.org/dataset/gdp-ranking>.

¹⁹¹ Jennifer M. Lind, "Pacifism or Passing the Buck? Testing Theories of Japanese Security Policy," *International Security* 29, no. 1 (Summer 2004): 95.

¹⁹² Nan Tian et al., "Trends in World Military Expenditure, 2018," *SIPRI Fact Sheet*, April 2019: 2.

¹⁹³ Ministry of Finance, *Summary of Revenues and Expenditures in General Account* (Tokyo: Japan Ministry of Finance, 2010), https://www.mof.go.jp/english/budget/statistics/201006/s201006_01a.pdf.

¹⁹⁴ Ministry of Finance.

¹⁹⁵ Ministry of Finance.

¹⁹⁶ Ministry of Finance, *Highlights of the Draft FY2015 Budget* (Tokyo: Japan Ministry of Finance, 2014), <https://www.mof.go.jp/english/budget/budget/fy2015/01.pdf>.

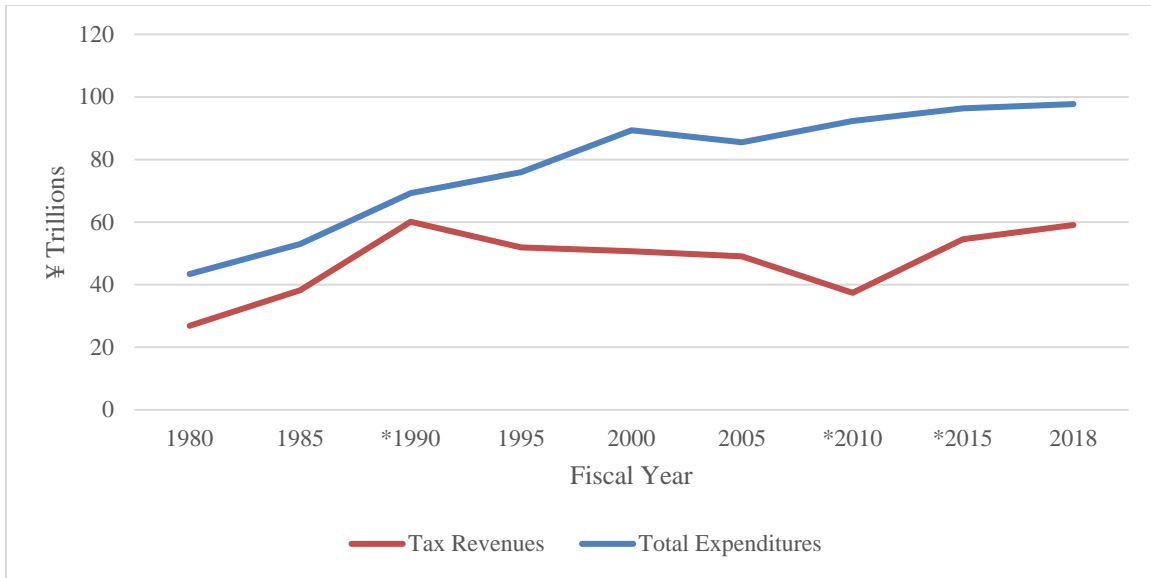


Figure 28. Japan’s Tax Revenues and Total Expenditures: FY1980–2018¹⁹⁷

To fill this tax revenues-total expenditures gap, Japan has more than likely relied on “government bond issues” (i.e., deficit spending), as well as “other revenues,” in order to pay for its increasing total expenditures. In FY1990, Japan’s deficit spending was ¥7.31 trillion, or 10.19 percent of the total revenues (Figure 29).¹⁹⁸ In FY2010, this number was ¥44.3 trillion, or 47.99 percent.¹⁹⁹ By 2015, Japan’s deficit spending dropped to ¥36.86 trillion, or 38.26 percent.²⁰⁰ Although Japan’s deficit spending has continued to decrease since, due to its long-term high deficit spending, Japan has accumulated an astronomical amount of government debt. Japan’s government debt is the largest in the world, exceeding 236.4 percent of GDP (as of 2017).²⁰¹ To put things in perspective, according to the *Fiscal Monitor: Capitalizing on Good Times*, “The IMF’s Debt Sustainability Analysis for Market

¹⁹⁷ Ministry of Finance; these figures do not include SACO-related expenses.

¹⁹⁸ Ministry of Finance.

¹⁹⁹ Ministry of Finance.

²⁰⁰ Ministry of Finance, *Highlights of the Draft FY2015 Budget* (Tokyo: Japan Ministry of Finance, 2014), <https://www.mof.go.jp/english/budget/budget/fy2015/01.pdf>.

²⁰¹ International Monetary Fund, *Fiscal Monitor: Capitalizing on Good Times* (Washington, DC: IMF, 2018), 7.

Access Countries identifies the critical debt thresholds ... as 85 percent of GDP for advanced economies.”²⁰²

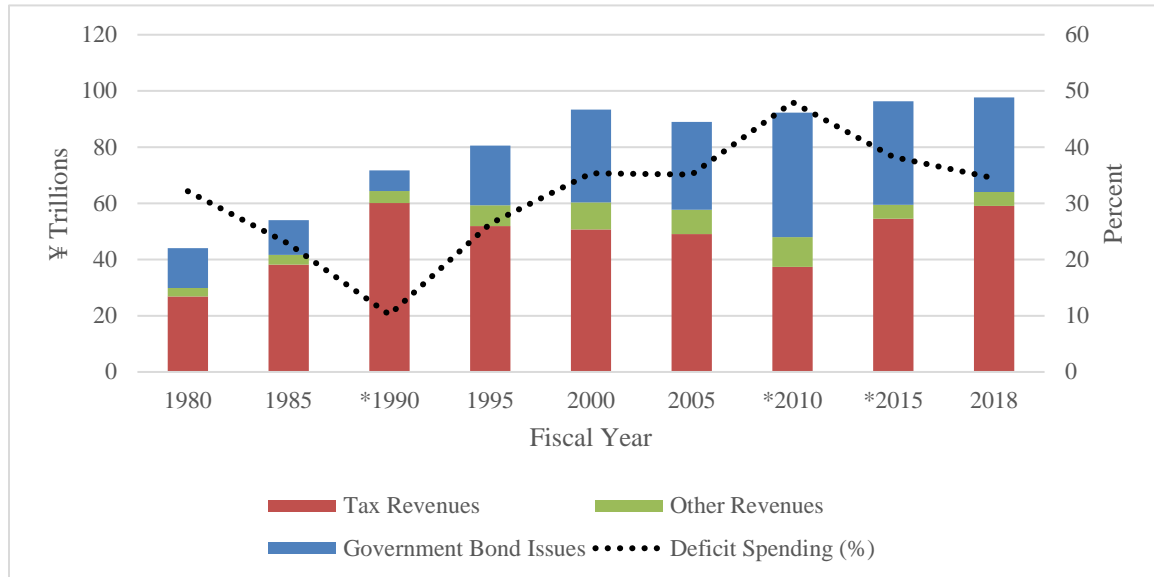


Figure 29. Japan’s Deficit Spending: FY1980–2018²⁰³

C. SUMMARY

This chapter analyzed the population conventional wisdom—a country’s population size is positively correlated with its ability to fund its military—and its application to Japan. The first section identified the yardstick used to measure the indirect constraints on military funding: Japan’s defense spending. The second section examined the main method Japan has most likely used to avoid the indirect constraints on military funding: deficit spending. It could be argued that the recent uptick in Japan’s deficit spending was not due to its current demographic situation per se; perhaps other reasons prompted the increase (e.g., Japan’s low one-percent cap, its changing security environment, or the 2011 Tohoku earthquake and tsunami). Nevertheless, this chapter found that Japan has maintained the SDF’s expenditure at sufficient levels despite negative

²⁰² International Monetary Fund, 6.

²⁰³ Adapted from Ministry of Finance, *Summary of Revenues and Expenditures*; total size of bar equates to total revenues.

social security and GDP impact. This is possible because Japan’s defense spending has been compensated with increasing deficit spending to maintain its historical one-percent of GDP defense budget, and perhaps by the easier ability to protect its defense spending that rarely exceeds one-percent of GDP (Figure 30).

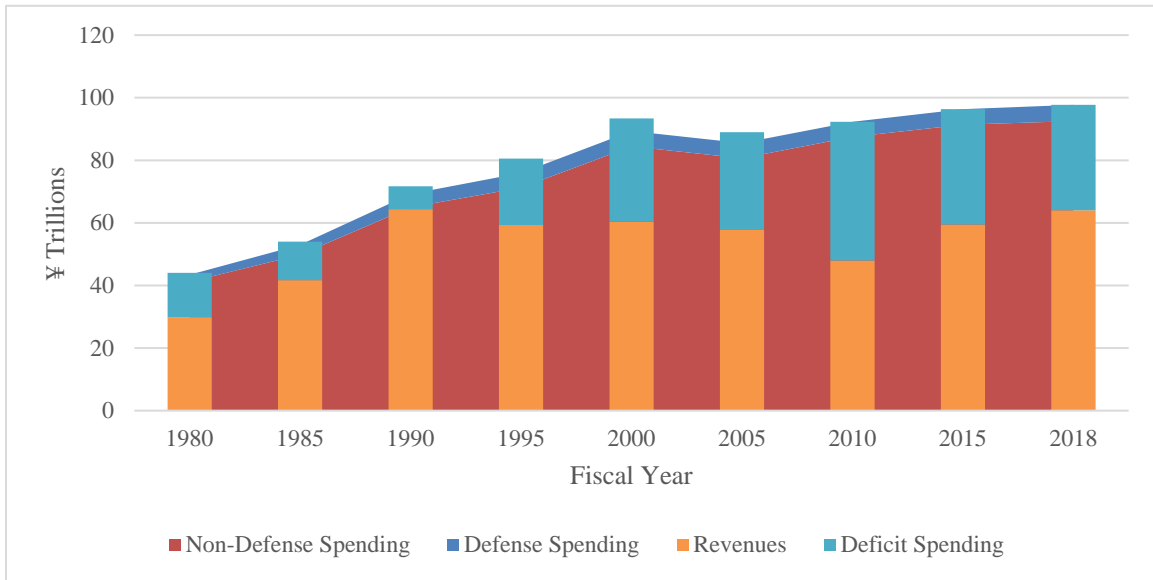


Figure 30. Japan’s Defense Spending vs. Deficit Spending: FY1980–2018²⁰⁴

²⁰⁴ These figures do not include SACO-related expenses; total size of area equates to total government spending; total size of bar equates to total revenues. Adapted from Ministry of Finance, *General Account Expenditures by Function*; Ministry of Finance, *Summary of Revenues and Expenditures*.

V. CONCLUSION

A. SUMMARY OF MAIN FINDINGS: RETHINKING THE POPULAR CONVENTIONAL WISDOM ON JAPAN

The major research question of this thesis was: Has Japan maintained its military manpower and funding despite deteriorating demographic trends? If so, how? The main findings suggest that Japan has successfully maintained both SDF manning and expenditure levels, and that it has done so by (1) manipulating some, but not all, possible recruitment and capital-intensiveness policies and (2) increasing its deficit spending. Thus, as Haas asserts, although population aging and decline appear to be inevitable, *how* countries respond to these demographic trends is not.²⁰⁵

1. Direct Population Constraints on Military Manpower

The first half of this research found that Japan has continued to maintain the SDF's staffing rate at roughly 92 percent and authorized strength at roughly 240,000 active personnel despite a shrinking recruitment pool since 1969. The SDF has more than enough applicants to maintain its historical 90 percent staffing rate, and could even achieve a 100 percent staffing rate if it so chose.

This thesis also examined methods Japan might have used to avoid the direct constraints of population on military manpower. As noted above, public relations and retirement-age extensions seem to have been most actively applied. Efforts to increase the number of female personnel, while successful in terms of percentage increases in absolute recruitment numbers, have only modestly contributed to shoring up the size of the overall force. Meanwhile, tools such as increasing reserve numbers, lowering military recruitment standards, and increasing capital intensity seem not to have been used, as these have all remained roughly constant even as Japan's population has declined. Therefore, it could be argued that in practice in Japan, thus far, the *actual* impact of population decline on military

²⁰⁵ Mark L. Haas, "America's Golden Years?: U.S. Security in an Aging World," in *Political Demography: How Population Changes Are Reshaping International Security and National Politics* (New York, NY: Oxford University Press, 2012), 52.

manpower could be illustrated as follows: (1) as population size decreases, so too will (2) recruitment pool size; however, (3a) manipulating the military's recruitment policies (4a) increases military manpower and/or (3b) increasing capital intensity (4) compensates for military manpower (Figure 31).

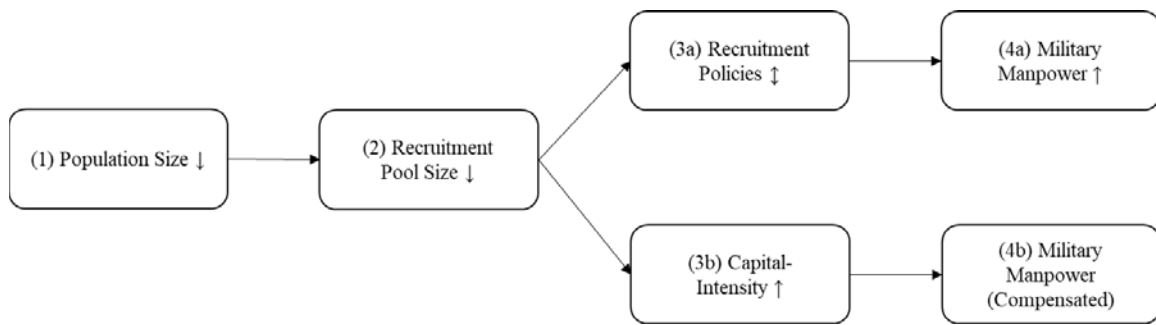


Figure 31. The *Actual* Impact of Population Decline on Military Manpower for Japan

2. Indirect Constraints on Military Funding

The second half of this research found that Japan has *always* maintained or increased its defense spending despite negative social security and GDP impact since 1980. This is possible because Japan's defense spending has been compensated with increasing deficit spending to maintain its historical one-percent of GDP defense budget, and perhaps because the one-percent amount is easier to protect from downturns and competing priorities in the first place.

Therefore, it could be argued that in practice in Japan thus far, the *actual* impact of population decline on military funding could be illustrated as follows: (1) population size decreases; however, (2) increasing deficit spending, (3a) decreases the crowding-out effect (4a) which increases military funding (relatively), and/or (3b) increases economic growth (4b) which increases military funding (absolutely) (Figure 32).

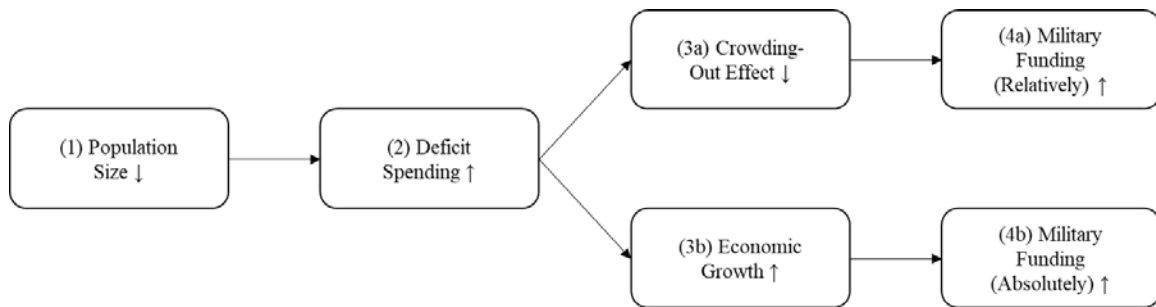


Figure 32. The *Actual* Impact of Population Decline on Military Funding for Japan

B. JAPAN'S FUTURE: WILL CURRENT TRENDS CONTINUE?

Japan has shown no sign of slowing down its population aging and decline. However, Japan's demographic trends have not constrained its military manpower and funding *thus far*. This thesis has argued that Japan has successfully maintained both SDF manning and expenditure levels by (1) manipulating certain recruitment policies and (2) increasing its deficit spending. This raises the following question: Will this lack of impact likely continue? In other words, how likely is Japan to maintain its military manpower and funding in the face of population aging and decline?

This research has introduced various methods Japan has likely undertaken that can plausibly be thought to have helped sustain both SDF manning and expenditure at consistent (and arguably sufficient) levels despite its aging and declining population. However, none of them are silver bullets. For example, preventing the crowding-out effect and/or slow economic growth is a method with limitations in the long-term for four reasons: first, increasing taxation is self-defeating (it slows economic growth); second, increasing deficit spending further exacerbates government debt; third, decreasing social security spending would be political suicide; fourth, decreasing discretionary spending is self-defeating (it decreases military funding).

That said, where these limits are is unclear, and—at least, to the extent possible to investigate within this thesis—Japan's success thus far does not appear overly reliant on policy manipulation or one-time initiatives that are inherently difficult to sustain. Japan's experience to date thus can be thought to have some predictive power, in at least the near

to medium term. Therefore, contrary to Eldridge, Tsunoda and Glosserman, and Yoshihara, it could be argued that we cannot simply assume Japan's demographic trends will constrain its military manpower and funding in the near future, so as long as its current approach factors persist.

C. RESEARCH LIMITATIONS

The findings of this thesis, and the data upon which they are based, do have some limitations and flaws worth mentioning. Notably, data unavailability posed one research limitation. As noted in Chapter I, many scholars have written on Japan's population aging and decline. Accordingly, much literature is available on these demographic trends' underlying causes and implications for social security spending and economic growth. Much literature is also available on the military implications of these demographic trends for countries other than Japan. However, aside from Eldridge, Tsunoda and Glosserman, and Yoshihara, there is little English-language literature that has specifically analyzed Japan's demographic trends and their impact on the SDF, especially with regard to the present day, as opposed to future projections. Moreover, even these scholars did not provide exact data, as they specifically analyzed *future* military implications of Japan's demographic trends, contrary to this thesis' focus on *past and current* military implications of Japan's demographic trends.

Another research limitation was the data unavailability for the SDF's (1) attrition rate and (2) statistics for female personnel prior to 2000. The figures presented in this thesis, created by the author, have been based on the data gathered from government publications and reports from Japan. In particular, annual white papers (*Defense of Japan*) provided the bulk of the MOD-related statistics for this research. Despite carefully examining and translating annual white papers (which are only available in the English-language from 2005 to 2019), the SDF's attrition rate and statistics for female personnel prior to 2000 remained regrettably unavailable.²⁰⁶

²⁰⁶ Figure III-3-2-1 (Trends in Incumbent Female SDF Personnel) in the *Defense of Japan 2018* provides a chart that displays *estimates* of the SDF's total number and service branch breakdown of female personnel from FY1954 to FY2017.

Another research limitation was the inability to answer why the SDF does not maintain a 100 percent staffing rate. This research found that Japan has *always* maintained the SDF's staffing rate at roughly 92 percent and authorized strength at roughly 240,000 active personnel despite a shrinking recruitment pool since 1969. This is possible because the SDF has more than enough applicants to maintain its historical 90 percent staffing rate, and could even achieve a 100 percent staffing rate if it so chose. This helps explain *how* Japan has maintained the SDF's manning at sufficient levels despite a shrinking recruitment pool, but not *why* applicants are so plentiful in the first place.

Nevertheless, the research limitations of this thesis suggest great opportunities for future research. For example, if capability and time permit, incorporating Japanese-language literature that has specifically analyzed Japan's demographic trends and their impact on the SDF into future research would more than likely expand this thesis' foundation—its literature review. It could also lead to new questions. As noted in Chapter I, Japan is one of the frontrunners in this global phenomenon of population aging and decline. Therefore, findings from this and possible future research on Japan could be useful as a model (though perhaps not a fully applicable one in all countries) for how countries might maintain their military staffing and spending as their populations' age and decline.

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