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# MILITARY SPENDING AND THE ARMS RACE ON THE KOREAN PENINSULA

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*The two Koreas have failed to produce any meaningful achievements in military confidence-building measures, arms control, and arms reduction. Moreover, South Korea's continued competitive edge over the North in conventional weapons capability has driven North Korea to mitigate its inferiority by pursuing the dangerous course of nuclear armament. This article attempts to understand the evolving nature of military spending and the arms race on the Korean peninsula. The first section analyzes and evaluates the dynamics of military spending and the arms race. The second section empirically compares patterns of military spending between the two Koreas, while the third compares their conventional defense capabilities. The article then traces how the arms race in conventional weapons has escalated into new dimensions of military confrontation involving North Korea's nuclearization and South Korea's countervailing measures. Finally, the determinants of military spending and the arms race on the Korean peninsula are examined and ways are suggested to manage them.*

**Key words:** East Asian security, South Korea, North Korea, military spending, arms race, nuclear weapons

## Military Spending and Arms Racing: Analytical Considerations

Why do countries elect to engage in arms races despite their high costs and associated risks? Among many suggested explanations, the most pronounced rationalization is framed around external threats, of which Louis P. Richardson's action-reaction model seems most persuasive.[1] According to his model, a country's defense spending is by and large determined by hostile military actions, the size of defense spending, and the accumulation of weapons by rival countries. The model has been further refined by adding a "grievance" variable. Even without such explicit interaction effects, a country is most likely to increase its defense spending when and if there is a grievance emanating from protracted hostility based on incompatible goals and ideological differences.

Central to the Richardson model is threat perception, which may not be necessarily actor-specific. Countries can build defense capabilities and increase military spending even in the absence of explicit enemies because the anticipation of strategic uncertainty resulting from a reconfiguration of global and regional power can induce some countries to undertake preemptive defensive buildups. For example, though neither China nor Japan faces any specific sources of threat, both have historically engaged in a subtle form of arms racing, especially in naval power. Alternatively, during the decade of engagement with North Korea, the progressive Roh Moo-hyun government increased its defense spending to respond to uncertain regional security dynamics such as China's rise and Japan's move toward a normal state.[2] A chang-

1. Louis F. Richardson, *Arms and Insecurity: A Mathematical Study of the Causes and Origins of War* (Pittsburgh, Penna.: Boxwood Press, 1960). In the Korean context, see Tong Whan Park, "Political Economy of the Arms Race in Korea: Queries, Evidence, and Insights," *Asian Survey*, vol. 26, No. 8 (August, 1986), pp. 839-50, and Eun-kook Lee, *Arms Race between South and North Korea* (in Korean) (Seoul: Daeyeongmunhwasa, 2007).
2. ROK Ministry of National Defense, *Defense White Paper 2006* (in Korean) (Seoul: MND, 2006), pp. 8-14.

ing regional security environment can thus serve as an important input variable in shaping the dynamic of defense spending and arms races.

An equally important determinant of defense spending is domestic politics. Three factors are typically considered in this context. First is the bureaucratic dimension. Allison and Halperin, for instance, hypothesized that defense spending is a function of bureaucratic rivalry among competing agencies.[3] Competition among the armed services for a greater share of the budget has been one of the most pronounced aspects of American defense budget politics. Nevertheless, in most countries, the defense budget tends to be subject to bureaucratic incrementalism, which allows for an automatic annual increase as long as atypical political or economic constraints and/or opportunities do not arise.

A second component is the influence of interest groups on patterns of defense spending. For example, the military-industrial complex and its lobbying efforts have traditionally had a major impact on the share and composition of the defense budget in the United States.[4] Although most countries may not be subject to such political pressures, having neither global security commitments nor defense industrial bases, vested domestic interests can be a salient factor in determining the nature and direction of defense spending.[5] At the same time, nongovernmental organizations critical of the defense establishment can also affect the size and allocation of the military budget.

The third important domestic factor is the preference of executive leadership. Inter-agency bargaining and societal interests are important, but they do not directly dictate defense spend-

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3. Graham T. Allison and Morton Halperin, "Bureaucratic Politics: A Paradigm and Some Policy Implications," *World Politics*, vol. 24 (Supplement) (Spring, 1972), pp. 40-79.
4. Steven Rosen, ed., *Testing the Theory of the Military-industrial Complex* (Lexington, Mass.: Lexington Books, 1973).
5. Chung-in Moon and Jin-Young Lee, "Revolution in Military Affairs and the Defense Industry in South Korea," *Security Challenges*, vol. 4, No. 4 (Summer, 2008), pp. 117-34.

ing. It is ultimately the executive leadership that filters various contending inputs from society and bureaucracy, and translates them into actual outcomes.[6] Thus, executive-political leadership is the most crucial domestic political vantage point in tracing defense spending and the propensity to engage in an arms race.

Alliance effects are another critical determinant for those countries participating in security cooperation. An alliance is an institutional arrangement that produces collective goods called "security" by managing common threats.[7] Thus, members of an alliance normally assume the costs of collective goods. Often, a country with hegemonic leadership allows its weaker partners to enjoy free riding in exchange for their loyalty. Otherwise, all members of the alliance are obliged to share the defense burden. In the case of foreign troop presence in an alliance partner, the beneficiary bears the defense costs. North Atlantic Treaty Organization (NATO) members, Japan, and South Korea are good examples in this regard. Likewise, alliance ties can also directly affect the nature and level of defense spending. In addition to alliance arrangements, broader external security ties can also affect the pattern of defense spending. Military assistance from external sources could mitigate pressures on domestic defense spending, whereas a sharp reduction or suspension of military assistance by external security partners could lead to an increase in defense spending.

Finally, overall macroeconomic conditions matter. For most countries, the level of defense spending is fundamentally constrained by domestic economic conditions. Rapid economic growth and a sound fiscal foundation are likely to allow a greater allocation of budget to the defense sector, while a weak economy can lead to a reduction in defense spending. For example, most Asian countries suffered a radical reduction in their

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6. See Stephen D. Krasner, *Defending the National Interest: Raw Materials Investments and U.S. Foreign Policy* (Princeton, N.J.: Princeton University Press, 1978).
7. Mancur Olson, Jr. and Richard Zeckhauser, "An Economic Theory of Alliances," *The Review of Economics and Statistics*, vol. 48, No. 3 (August, 1966), pp. 266-79.

defense budget during the financial crisis of 1997. This was not only due to the weak fiscal situation, but also to conditions imposed by the International Monetary Fund (IMF) that called for fiscal discipline.

Size is also significant, as the larger the national economy, the greater the absolute amount of defense spending. Japan is a classic case. Japan has generally been allocating less than one percent of its GNP to the defense sector, but its military spending is the third largest in the world. In contrast, North Korea is known to have allocated almost 30 percent of its gross national income (GNI) to the defense sector, but the actual amount of its defense spending is only one third that of South Korea.

In sum, threat perception and interaction effects, domestic political factors, alliance effects, and the overall condition of the national economy can greatly influence the patterns of defense spending, discretely or in combination.

## Patterns of Defense Spending in Two Koreas: South Korea

According to *Table 1*, South Korea spent meagerly on the military during the decade following the Korean War (1950-1953). From 1953 to 1965, its annual average defense budget was less than $150 million and the ratio of defense spending to gross national product (GNP) decreased from an annual average of 7 percent in the 1950s to 4 percent in the 1960s. Despite the bitter experience of the Korean War, economic backwardness prevented the South Korean government from allocating a larger portion of public expenditure to the defense sector. During this period, a great portion of defense expenditures was financed through a counter-fund created through the supply of Korean goods and services to the American military based in South Korea.[8]

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8. Stephan Haggard, Byung-kook Kim, and Chung-in Moon, "The Transition to Export-led Growth Strategy in South Korea 1954-1966," *Journal of Asian Studies*, vol. 50, No. 4 (November, 1991), pp. 850-73; ROK Ministry of National Defense, *The History of National Defense*, vol. 4 (in Korean) (Seoul: MND Gunsapyeonchanyeonguso, 2002), pp. 378-87.

*Table 1*. Defense Spending in South Korea by Year*

| Year | Defense budget (bn Won) | Defense budget (bn US$) | % of GDP | % of GNP | % of public expenditure | Rate of Increase Won (%) | Rate of Increase $ (%) |
|---|---|---|---|---|---|---|---|
| 1960 | 14.7 | 0.148 | 7.40 | 6.7 | 35.0 | 5.7 | -4.5 |
| 1961 | 16.6 | 0.126 | 6.00 | 5.6 | 29.0 | 12.8 | -14.9 |
| 1962 | 20.5 | 0.136 | 5.91 | 5.9 | 23.2 | 23.4 | 7.9 |
| 1963 | 20.5 | 0.114 | 4.22 | 4.2 | 28.1 | 0.0 | -16.2 |
| 1964 | 24.9 | 0.102 | 3.52 | 3.6 | 33.2 | 21.7 | -10.5 |
| 1965 | 29.9 | 0.112 | 3.73 | 3.7 | 31.9 | 19.8 | 9.8 |
| 1966 | 40.5 | 0.144 | 4.00 | 3.9 | 28.8 | 35.7 | 28.6 |
| 1967 | 49.6 | 0.167 | 3.98 | 4.0 | 27.4 | 22.1 | 16.0 |
| 1968 | 64.7 | 0.212 | 4.08 | 4.1 | 24.7 | 30.7 | 26.9 |
| 1969 | 84.4 | 0.269 | 4.14 | 4.1 | 22.8 | 30.4 | 26.9 |
| 1970 | 102.4 | 0.299 | 3.69 | 4.0 | 23.2 | 21.3 | 11.2 |
| 1971 | 134.7 | 0.374 | 3.94 | 4.3 | 24.7 | 31.7 | 25.0 |
| 1972 | 173.9 | 0.443 | 4.13 | 4.5 | 24.8 | 28.9 | 18.2 |
| 1973 | 183.5 | 0.461 | 3.37 | 3.7 | 28.2 | 5.8 | 4.3 |
| 1974 | 296.8 | 0.697 | 3.63 | 4.4 | 29.1 | 61.7 | 51.2 |
| 1975 | 442.4 | 0.914 | 4.25 | 4.9 | 28.5 | 49.0 | 31.1 |
| 1976 | 703.8 | 1.454 | 4.91 | 5.8 | 32.4 | 59.1 | 59.0 |
| 1977 | 949.6 | 1.962 | 5.18 | 6.2 | 34.7 | 34.9 | 34.9 |
| 1978 | 1,289.4 | 2.644 | 4.98 | 5.8 | 36.4 | 35.8 | 34.8 |
| 1979 | 1,526.3 | 3.046 | 4.80 | 5.3 | 30.3 | 18.3 | 15.2 |
| 1980 | 2,257.7 | 3.706 | 5.81 | 6.4 | 34.8 | 47.9 | 21.7 |
| 1981 | 2,697.9 | 3.925 | 5.54 | 5.63 | 33.6 | 19.5 | 5.9 |
| 1982 | 3,120.7 | 4.263 | 5.60 | 5.73 | 33.5 | 15.7 | 8.6 |
| 1983 | 3,274.1 | 4.797 | 4.99 | 5.79 | 31.4 | 4.9 | 12.5 |
| 1984 | 3,306.1 | 4.104 | 4.40 | 4.50 | 29.6 | 1.0 | -14.4 |
| 1985 | 3,689.2 | 4.237 | 4.39 | 4.50 | 29.4 | 11.6 | 3.2 |
| 1986 | 4,158.0 | 4.717 | 4.24 | 4.33 | 30.1 | 12.7 | 11.3 |
| 1987 | 4,745.7 | 5.770 | 4.12 | 4.20 | 29.6 | 14.1 | 22.3 |
| 1988 | 5,520.2 | 7.556 | 4.03 | 4.05 | 30.0 | 16.3 | 31.0 |
| 1989 | 6,014.8 | 8.960 | 3.89 | 3.90 | 27.3 | 9.0 | 18.6 |
| 1990 | 6,637.8 | 9.375 | 3.56 | 3.56 | 24.2 | 10.4 | 4.6 |
| 1991 | 7,452.4 | 10.159 | 3.31 | 3.30 | 23.8 | 12.6 | 8.4 |
| 1992 | 8,410.0 | 10.771 | 3.27 | 3.27 | 25.1 | 12.5 | 6.0 |
| 1993 | 9,215.4 | 11.480 | 3.17 | 3.18 | 24.2 | 9.6 | 6.6 |
| 1994 | 10,075.3 | 12.514 | 2.96 | 2.96 | 23.3 | 9.3 | 9.0 |

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|---|---|---|---|---|---|---|---|
| 1995 | 11,074.4 | 14.363 | 2.78 | 2.79 | 21.4 | 9.9 | 14.8 |
| 1996 | 12,243.4 | 15.214 | 2.73 | 2.74 | 20.8 | 10.6 | 5.9 |
| 1997 | 13,786.5 | 14.495 | 2.81 | 2.82 | 20.7 | 12.6 | -4.7 |
| 1998 | 13,800.0 | 9.865 | 2.85 | 2.90 | 18.3 | 0.1 | -31.9 |
| 1999 | 13,749.0 | 11.559 | 2.60 | 2.63 | 16.4 | -0.4 | 17.2 |
| 2000 | 14,477.4 | 12.805 | 2.50 | 2.41 | 16.3 | 5.3 | 10.8 |
| 2001 | 15,388.4 | 11.921 | 2.47 | 2.37 | 15.5 | 6.3 | -6.9 |
| 2002 | 16,364.0 | 13.037 | 2.39 | 2.26 | 14.9 | 6.3 | 9.4 |
| 2003 | 17,514.8 | 14.695 | 2.42 | 2.28 | 14.8 | 7.0 | 12.7 |
| 2004 | 18,941.2 | 16.547 | 2.43 | 2.28 | 15.8 | 8.1 | 12.6 |
| 2005 | 21,102.6 | 20.602 | 2.60 | 2.44 | 15.6 | 11.4 | 24.5 |
| 2006 | 22,512.9 | 23.561 | 2.66 | 2.47 | 15.3 | 6.7 | 14.4 |
| 2007 | 24,497.2 | 26.364 | 2.72 | 2.51 | 15.5 | 8.8 | 11.9 |
| 2008 | 26,649.0 | 24.169 | 2.76 | 2.59 | 15.2 | 8.8 | -8.3 |
| 2009 | 28,980.3 | – | – | – | 10.8 | 8.7 | – |

Sources: Various issues of the *Defense White Paper* (ROK Ministry of National Defense); ROK Ministry of National Defense, *The History of National Defense*, vol. 4; Hamm, *Arming the Two Koreas*; The Bank of Korea, http://ecos.bok.or.kr/.

* Current price. Data on percent of GDP after 1981 were drawn from *Defense White Paper* (2009), p. 358. Data prior to 1980 are calculated from nominal GDP. As to estimates of foreign exchange rate (1960-1989), see Taik-young Hamm, *The Political Economy of National Security* (in Korea) (Seoul: Bobmunsa, 1998), pp. 206-207.

During this period, such U.S. military assistance was vital given the overall economic conditions, as it was virtually inconceivable for the South Korean government to maintain its 600,000 forces independently. For example, U.S. military assistance reached $356 million in 1958, almost three times South Korea's total defense budget of $143 million.[9] South Korea relied heavily on the United States for the acquisition of weapons, equipment, and logistics.[10] Only in 1969 did South Korea almost double its defense spending to $269 million, reaching $374 million in 1971. Nevertheless, defense spending as a share of GNP remained at 4 to 4.5 percent from 1968 to 1971. This can be partly attributed to a

9. Taik-young Hamm, *Arming the Two Koreas: State, Capital and Military Power* (London: Routledge, 1999), p. 93.
10. Lee Pil Jung and Kim Yong-Hui, "The Influence of USFK Changes on ROK's Military Build-up" (in Korean), *Gukjejeongchinonchong*, vol. 47, No. 1 (2007), pp. 177-78.

post-Korean War economic boom followed by the adoption of an export-led growth strategy in the mid-1960s.

A major transformation in defense spending occurred in the mid-1970s. Alarmed by North Korea's military provocation, combined with the waning American security commitment under the Nixon Doctrine, President Park Chung-hee decided to pursue a self-reliant defense posture.

Defense industrialization became the top policy priority, and the size of the defense budget rose 51.2 percent, from $461 million in 1973 to $697 million in 1974. The annual rate of increase in defense spending reached 59 percent in 1976, by this time accounting for almost 6 percent of GNP as a result of defense industrialization and the defense burden-sharing formula with the United States. The trend continued until 1983. As part of the effort to modernize and upgrade its weapons and equipment, the Park Chung-hee government initiated and implemented the first phase of the armed force modernization project (Yulgok Project) by imposing a new defense tax. Almost 30 percent of the defense budget was allocated to the Yulgok Project, amounting to a cumulative total of 3.14 trillion won during 1974-1982.

Although it continued to allocate a significant portion of the defense budget (5.32 trillion won) for the second phase of armed force modernization,[11] the succeeding Chun Doo-hwan government encountered a dilemma. On the one hand, his government was obliged to spend 6 percent of GNP in order to comply with the defense burden-sharing formula with the United States, but on the other hand, it was under immense pressure from the IMF to implement macroeconomic stabilization through tight fiscal and monetary policy. The Chun government began to trim its defense budget by adhering to the IMF's call for macroeconomic stabilization. The defense budget share of GNP dropped from 5.79 percent in 1983 to 4.5 percent in 1984, and defense spending was cut from $4.8 billion in 1983 to $4.1 billion in 1984 (see *Table 1*).

The democratic opening and the advent of the post-cold

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11. ROK Ministry of National Defense, *The Past, Present, and Future of the Yulgok Project* (in Korean) (Seoul: MND, 1994), pp. 31-34.

war era further facilitated a downsizing of the defense budget. Although the amount of defense spending rose incrementally in absolute terms, its relative share in GNP and government expenditure began to fall sharply. The defense-budget-to-GNP ratio fell from 3.9 percent in 1989 to 3.18 percent in 1993 and to the 2 percent level throughout the Kim Young-sam government (1993-1997), while its share of total government expenditures decreased from 27.3 percent in 1989 to 24.2 percent in 1993 and 20.8 percent in 1996. National security could no longer be justified as a *deus ex machina* under the post-cold war template, and democratization created greater public demand for welfare and education. Noteworthy is a sharp drop in absolute defense spending from $14.5 billion in 1997 to $9.87 billion in 1998, corresponding to a fall in the share of government expenditures from 18.3 percent in 1998 to 16.4 percent in 1999. The most critical cause for the downturn was the acute financial crisis in 1997-1998, which necessitated a severe fiscal contraction as well as the diversion of government budget to the welfare sector in order to expand the social safety net for victims of the crisis. President Kim Dae-jung's assertive pursuit of engagement with North Korea and the new zeitgeist for peaceful coexistence following the first Korean summit in 2000 further eroded public support for defense-sector spending.[12]

However, the progressive Roh Moo-hyun government, which championed a self-reliant defense posture, reversed this trend. President Roh stated in a meeting with military commanders on June 21, 2003: "It takes money to seek a self-reliant national defense. I will restore defense budget to the level prior to the financial crisis."[13] Subsequently, the Roh government increased the share of defense spending in GDP from 2.42 percent in 2003 to 2.72 percent in 2007. The share of defense spending in total government expenditures also increased, from 14.8 percent in 2003 to 15.5 percent in 2007. The absolute amount of the defense

12. Kim Dae-jung, *Collection of Speeches*, vol. 3 (in Korean) (Seoul: the Office of the President, 2001).
13. *Yonhap News*, June 21, 2003, www.yonhapnews.co.kr/.

budget rose by 79.4 percent in dollar terms during this period. The move can be attributed to President Roh's efforts to reduce dependence on the United States in critical weapons and equipment, as well as to prepare for strategic uncertainty in the region going beyond North Korea. Roh was well aware that when Korea was weak, it fell prey to big-power conflicts against its will, as evidenced by the Sino-Japanese War in 1894 and the Russo-Japanese War in 1904. In light of the North Korean nuclear problem, the cross-strait tension, territorial disputes, and great-power rivalry, he believed that such a historical pattern could recur and that South Korea should prepare for such contingency.[14]

Ironically, the pattern of defense spending under the Lee Myung-bak government, which won the presidential election on a conservative platform emphasizing a strong national defense, has been quite different. Although the actual amount of defense spending rose slightly as part of a fiscal stimulus package to cope with the global financial crisis, the relative share vis-à-vis total government spending was radically reduced to 10.8 percent in 2009. The Lee government has also decided to cut the estimated budget for the Defense Reform 2020 from the original budget of 621.3 trillion won to 599.3 trillion won.[15]

## Patterns of Defense Spending in Two Koreas: North Korea

A close comparison with North Korean defense spending in the period immediately following the Korean War is difficult since statistics were difficult to come by until the early 1960s. The North did not clarify the appropriation category of defense-related spending. It was only after First Vice Premier Kim Il

14. ROK Ministry of National Defense, *National Defense Reform Preparing for the 21st Century, 1998-2002* (Seoul: MND, 1998), pp. 16-21; ROK Ministry of National Defense, *Defense White Paper 2006*, p. 8; Roh Moo-hyun, *Collection of Speeches*, vol. 3 (in Korean) (Seoul: The Office of the President, 2006), p. 396, 475.
15. *Yonhap News*, June 26, 2009.

made an open report to the 5th Korea Workers' Party Congress on defense spending in 1970 that statistical analysis became more meaningful. As Table 2 demonstrates, an estimated average of 19 percent of government spending was allocated to the defense sector during 1960-1966, rising to 30 percent in 1967 and continuing upward until 1971.

Two factors can account for the trend. First, the worsening relationship with China and the Soviet Union drove the North Korean leadership to look for a more self-reliant defense buildup. The Soviet Union drastically reduced its military assistance to North Korea as the latter favored China during the Sino-Soviet dispute in the early 1960s. But Pyongyang's relationship with Beijing also deteriorated because of the Cultural Revolution. In this context, North Korea began to spend more on defense for a rapid military buildup.[16] Second, North Korea's military adventurism was another factor. Given North Korea's increased military provocations during this period—the commando raid on the Blue House, the presidential residence, in 1968; the seizure of the U.S. naval ship *Pueblo*; and the heightened military tension over the demilitarized zone—the defense buildup could have been closely associated with its offensive military posture toward the South.

But the ratio of defense to government spending proceeded to fall beginning in 1972, decreasing from 31.1 percent in 1971 to 17 percent in 1972. The trend continued through the 1980s, reaching a floor of 11.4 percent in 1994. The advent of Soviet-U.S. détente and the July 4th Joint Declaration of 1972 could have facilitated the downward spiral, likely furthered by the end of the cold war in 1990. However, the downsizing also appears to dovetail with overall economic performance, as worsening economic conditions could not have buttressed the traditional pattern of defense spending. The collapse of the socialist bloc and subsequent suspension of its economic and military assistance

16. Kim Yeon Chul, "The Political Economy of North Korea's Industrialization" (in Korean), in Bukhanyeonguhakhoe, ed., *The North Korean Economy* (Seoul: Gyeong-inmunhwasa, 2006), pp. 74-79.

dealt an additional blow to the North.

During the period of North Korea's "Arduous March" (1994-1997), figures on defense spending were not made available. Only after 1998 did the North report a return to normal patterns of defense spending. For the decade of 1998-2008, the share of defense spending in total government expenditure hovered between 14 percent and 16 percent (see *Table 2*). A sudden rise in the actual amount of defense spending from 3.3 billion North Korean won (NKW) in 2002 to NKW50.7 billion in 2003 was not a result of an actual budget increase, but a change in accounting units that reflected a new monetary and foreign exchange rate policy in July 2002. Interestingly, no interaction effects can be detected in the defense spending of the two Koreas. On the contrary, an asymmetric pattern of defense spending has emerged since the mid-1970s in which the North has been reducing its spending on the defense sector while the South has been accelerating its military spending.

*Table 2*. North Korea's Defense Spending: Official and Estimated Figures

| Year | Total budget (bn Won) | Official Defense Budget | | MND estimates | | ACDA/US Dept. of State estimates | | Hamm's estimates 1960-97 (bn $) |
|---|---|---|---|---|---|---|---|---|
| | | % of Total budget | bn Won | % of Total budget | bn $ | 1968-1999 (bn $) | 1995-2005 (bn $) | |
| 1960 | 1.968 | (19.0) | 0.374 | 30.9 | 0.24 | – | – | 0.166 |
| 1961 | 2.338 | (19.8) | (0.613) | 30.9 | 0.28 | – | – | 0.162 |
| 1962 | 2.729 | (19.8) | (0.613) | 30.9 | 0.33 | – | – | 0.181 |
| 1963 | 3.028 | (19.8) | (0.613) | 30.9 | 0.36 | – | – | 0.200 |
| 1964 | 3.418 | (19.8) | (0.613) | 30.9 | 0.41 | – | – | 0.304 |
| 1965 | 3.476 | (19.8) | (0.613) | 30.9 | 0.42 | – | – | 0.343 |
| 1966 | 3.571 | (19.8) | (0.613) | 30.9 | 0.43 | – | – | 0.387 |
| 1967 | 3.948 | 30.4 | 1.201 | 30.4 | 0.47 | – | – | 0.513 |
| 1968 | 4.813 | 32.4 | 1.565 | 32.4 | 0.61 | 0.587 | – | 0.672 |
| 1969 | 5.049 | 31.0 | 1.560 | 31.0 | 0.61 | 0.617 | – | 0.681 |
| 1970 | 6.003 | 29.2 | 1.753 | 29.2 | 0.68 | 0.576 | – | 0.742 |
| 1971 | 6.302 | 31.1 | 1.960 | 31.1 | 0.76 | 0.757 | – | 0.975 |
| 1972 | 7.389 | 17.0 | 1.256 | 30.9 | 0.97 | 1.025 | – | 0.786-1.094 |
| 1973 | 8.314 | 15.4 | 1.280 | 30.9 | 1.09 | 1.084 | – | 0.841-1.156 |

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|---|---|---|---|---|---|---|---|---|
| 1974 | 9.672 | 16.1 | 1.557 | 30.9 | 1.26 | 1.368 | – | 0.917-1.310 |
| 1975 | 11.368 | 16.4 | 1.864 | 30.9 | 1.71 | 1.080-2.0 | – | 1.096-1.574 |
| 1976 | 12.326 | 16.7 | 2.058 | 30.9 | 1.77 | 1.305-2.2 | – | 1.147-1.680 |
| 1977 | 13.349 | 15.7 | 2.096 | 30.9 | 1.91 | 1.253-2.5 | – | 1.243-1.795 |
| 1978 | 14.744 | 15.9 | 2.344 | 30.9 | 2.45 | 1.310-4.04 | – | 1.340-1.971 |
| 1979 | 16.973 | 15.1 | 2.563 | 30.9 | 2.92 | 1.315-4.18 | – | 1.595-2.288 |
| 1980 | 18.837 | 14.6 | 2.750 | 30.9 | 3.25 | 1.300-4.38 | – | 1.585-2.332 |
| 1981 | 20.333 | 14.8 | 3.009 | 30.9 | 3.24 | 3.24-4.54 | – | 1.828-2.637 |
| 1982 | 22.204 | 14.6 | 3.242 | 30.9 | 3.40 | 3.5-4.7 | – | 2.046-2.899 |
| 1983 | 24.019 | 14.7 | 3.531 | 30.9 | 3.43 | 3.6-4.88 | – | 2.019-2.934 |
| 1984 | 26.158 | 14.6 | 3.819 | 30.9 | 3.48 | 5.06-5.2 | – | 2.069-3.043 |
| 1985 | 27.329 | 14.4 | 3.935 | 30.9 | 4.00 | 5.26-5.4 | – | 2.348-3.332 |
| 1986 | 28.896 | 14.0 | 4.045 | 30.9 | 4.22 | 5.44-5.6 | – | 2.463-3.485 |
| 1987 | 30.085 | 13.2 | 3.971 | 30.0 | 4.42 | 5.64-5.9 | – | 2.457-3.475 |
| 1988 | 31.661 | 12.2 | 3.863 | 30.0 | 4.66 | 5.84 | – | 2.961-3.941 |
| 1989 | 33.383 | 12.0 | 4.006 | 30.0 | 4.98 | 6.0 | – | 2.603-3.605 |
| 1990 | 35.514 | 12.0 | 4.262 | 30.0 | 5.15 | 5.94 | – | 2.189-3.173 |
| 1991 | 36.909 | 12.1 | 4.466 | 29.9 | 5.13 | 5.00 | – | 3.037-3.435 |
| 1992 | 39.303 | 11.4 | 4.481 | 30.0 | 5.54 | 5.50 | – | 2.688-3.638 |
| 1993 | 40.243 | 11.5 | 4.628 | 30 | 5.62 | 5.30 | – | 2.559-3.744 |
| 1994 | 41.442 | 11.4 | 4.724 | 30 | 5.76 | 5.50 | – | 2.370-3.836 |
| 1995 | 24.220 | – | – | (30) | (6.24) | 6.00 | 6.54 | 2.353-3.318 |
| 1996 | 20.600 | 14.6 | 3.0 | – | 5.78 | 6.00 | 6.21 | 2.259-3.012 |
| 1997 | (19.712) | – | – | 52 | 4.78 | 6.00 | 5.21 | 2.147-2.863 |
| 1998 | 20.015 | 14.6 | 2.922 | 52 | 4.78 | 4.30 | 4.40 | – |
| 1999 | 20.018 | 14.6 | 2.923 | 51 | 4.78 | 4.26 | 4.58 | – |
| 2000 | 20.956 | 14.3 | 2.997 | 52 | 5.0 | – | 4.88 | – |
| 2001 | 21.679 | 14.4 | 3.222 | 51 | 5.0 | – | 4.89 | – |
| 2002 | 22.129 | 14.9 | 3.297 | 50 | 5.0 | – | 5.11 | – |
| 2003 | 323.449 | 15.7 | 50.781 | 44.4 | 5.0 | – | 5.60 | – |
| 2004 | 348.807 | 15.6 | 54.414 | – | – | – | 6.12 | – |
| 2005 | 405.700 | 15.9 | 64.506 | – | – | – | 6.72 | – |
| 2006 | 419.282 | 16.0 | 67.085 | – | – | – | – | – |
| 2007 | 433.235 | 15.8 | 68.541 | – | – | – | – | – |
| 2008 | 451.500 | 15.8 | 71.330 | – | – | – | – | – |
| 2009 | 482.600 | 15.8 | 76.250 | – | – | – | – | – |

Sources: ROK MND, *Defense White Paper* (various issues); ACDA/U.S. Department of State Bureau of Verification and Compliance, "WMEAT"; *Nodong Shinmun* (various issues); IMF, "Democratic People's Republic of Korea Fact Finding Report"; *Yonhap News* (www.yonhapnews.co.kr); Hamm, *Arming the Two Koreas;* Moon Sung-min, "The Present Condition and Problems of North Korea's Financial Institutions."

However, a caveat is in order regarding North Korea's defense spending figures. As evident in *Table 2*, there are several contending estimates of North Korea's defense spending. The Ministry of National Defense (MND) of South Korea estimated that the North allocated an annual average of 30 percent of its government budget for the defense sector between 1972 and 1995, and increased this figure to roughly 50 percent since 1997. Estimates by the U.S. State Department, including the Arms Control and Disarmament Agency (ACDA), have been slightly higher than those of the MND. Meanwhile, estimates by the International Institute for Strategic Studies (IISS) and the Stockholm International Peace Research Institute (SIPRI) have been derived from official data provided by the North Korean government.[17] Hamm presents the most conservative figures (see *Table 2*). These contending estimates have produced a reliability problem with regard to North Korea's data, eventually leading to a suspension of efforts at estimation. Transparency has been a major problem. Official defense budgets only include figures for wages, operation and management expenses, maintenance, and acquisition of weapons and equipment. But investments in the secondary economy (defense industrial sector), research and development (R&D) investment in dual-use technology, and other social welfare services provided through the defense sector are not fully reflected in the official figures.[18] Additionally, were purchasing power parity to be factored in, North Korea's defense spending could be much higher.

Data unreliability notwithstanding, ROK's *Defense White Paper 2008* estimated that more than 30 percent of North Korea's gross national income (GNI) went to the defense sector in 2007.[19]

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17. International Institute for Strategic Studies, *The Military Balance* (various issues); Stockholm International Peace Research Institute, SIPRI Year Book (various issues).
18. Sung Chae-gi, "The Economic Base of North Korea's Military Power: Historical and Positive Analysis of 'the Military Economy'"(in Korean), in Graduate School of North Korean Studies, Kyungnam University, ed., *Recasting the Question of the North Korean Military* (Paju, ROK: Hanul, 2006), pp. 307-10.
19. ROK Ministry of National Defense, *Defense White Paper 2008* (Seoul: MND, 2009), p. 30.

According to the Bank of Korea, North Korea's GNI is estimated at $20.8 billion in 2004 and $26.7 billion in 2007, from which we can infer that the North spent $6.24 billion in 2004 and $8 billion in 2007 for the defense sector. Meanwhile, South Korea's defense spending in 2007 was $26.3 billion, which is almost equivalent to North Korea's GNI ($26.7 billion) and three times larger than that of North Korea.

## Comparing North and South Korea Military Capabilities

A static, bean-counting analysis of military capabilities between the two Koreas suggests that North Korea is far superior to the South. *Table 3* reveals that the South leads the North only in three areas: the size of navy personnel (South, 68,000; North, 60,000), armored vehicles (South, 2,400; North, 2,100), and helicopters (South, 680; North, 310). North Korea maintains a rather striking superiority in other areas. In addition to manpower (South, 655,000; North, 1.19 million), the North fares far better than the South in tanks (2,300 vs. 3,900), field artillery (5,200 vs. 8,500), multiple launcher rocket systems (MLRS) (200 vs. 5,100), warships (120 vs. 420), landing vessels (10 vs. 260), submarines (10 vs. 70), and fighter planes (490 vs. 840). North Korea also has an estimated 7.7 million people in the reserves who can be readily mobilized, while the South has about 3 million people in the reserves.

On the surface, South Korea should be alarmed at this huge gap in defense capabilities vis-à-vis North Korea. In reality, however, South Korean government officials as well as ordinary citizens seem to be little concerned about this disparity. This may be due to a "perceived superiority" in conventional forces by South Korea.

An in-depth analysis reveals why. Let's take the example of tanks. Although the North maintains a competitive edge in quantity, a qualitative analysis renders quite a different outcome. North Korea introduced most of its tanks (i.e., T-55, T-54, T-59) in the 1950s. The *Cheonmaho*, improved from the T-72 in

*Table 3*. Comparison of Military Capabilities between ROK and DPRK

(As of December 2008)

| Classification | | | | ROK | DPRK |
|---|---|---|---|---|---|
| Troops (Peace time) | | Total | | More than 655,000 | More than 1,190,000 |
| | | Army | | 522,000 | 1,020,000 |
| | | Navy | | 68,000 | 60,000 |
| | | Air Force | | 65,000 | 110,000 |
| Principal Force Capability | Army | Units | Corps | 10 (including Special Warfare Command) | 15 |
| | | | Divisions | 46 | 86 |
| | | | Maneuver Brigades | 15 | 69 (10 Reserve Military Training Units not included) |
| | | Equipment | Tanks | 2,300 | 3,900 |
| | | | Armored vehicles | 2,400 | 2,100 |
| | | | Field artillery | 5,200 | 8,500 |
| | | | MLRS | 200 | 5,100 |
| | | | Surface-to-surface Guided weapons | 30 (launchers) | 100 (launchers) |
| | Navy | Surface ships | Combat vessels | 120 | 420 |
| | | | Landing vessels | 10 | 260 |
| | | | Mine warfare ships | 10 | 30 |
| | | | Support vessels | 20 | 30 |
| | | Submarines | | 10 | 70 |
| | Air Force | Combat aircraft | | 490 | 840 |
| | | C2-ISR aircraft | | 50 (including naval aircraft) | 30 |
| | | Air mobility aircraft | | 40 | 330 (including AN-2) |
| | | Training aircraft | | 170 | 180 |
| | | Helicopters | | 680 (including all helicopters of the 3 services) | 310 |
| Reserve troops | | | | 3,040,000 | 7,700,000 (including Reserve Military Training Units, Worker/Peasant Red Guards and Red Youth Guards) |

*Defense White Paper 2008*, p. 316.

* Naval troops of the ROK include 27,000 troops of the Marine Corps. Ground force units (division, brigade) and equipment include those of the Marine Corps.

* Field artillery of the North does not include infantry regiment's 76.2mm guns.

the 1990s, is its most updated version in deployment, but it cannot match South Korea's K-1 tank and K1A1 armed vehicle in terms of fire power and sustainability.[20] Similarly, most surface ships in the North are small in size, being less than 100 tons, and are outdated in fire control systems and electronic equipment.[21]

In the case of air power, the North appears even more inferior. Two thirds of North Korea's fighter planes are composed of the MiG-19 and MiG-21, with only thirty-five of the more advanced MiG-29s in service. The North has also acquired an unknown number of MiG-23s and SU-25s. But South Korea has been retiring outdated fighters comparable to the MiG-19 and MiG-21, and has acquired 118 KF-16Cs, 47 KF-16 Ds, and 39 F-15Ks, cutting-edge fighters even by global standards.[22] Furthermore, the North Korean air force cannot match its South Korean counterpart in terms of sortie numbers, flying time, and on-ground training via simulators.

The South Korean government has thus begun to adopt a more realistic force assessment since 2004. The Korea Institute of Defense Analysis (KIDA) is known to have applied the RAND-developed Situation Force Scoring (SFS) method to assess inter-Korean defense capabilities by taking into account variables such as firepower, mobility, sustainability, training, morale, combat readiness, combat scenarios, and overall terrain.[23] Its findings show that ROK air power is superior to that of North Korea by 103 to 100, whereas naval power (90 vs. 100) and ground power (80 vs. 100) favor the North.[24] Nevertheless, Hamm and Suh suspect the reliability of the KIDA findings because they hardly differ from previous findings based on a simplistic

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20. Lee Jeong-yeon, *North Korean Soldiers Do Not Have Crackers? North Korea's Military and Nuclear Weapons Written by a Former North Korean Official* (in Korean) (Seoul: Peullenitmidieo, 2007), p. 264.
21. Lee Gyu-yeol, Um Tae-am, Yu Ji-yong, and Jung Ki-yeong, *Military Capabilities in Northeast Asia, 2007-2008* (in Korean) (Seoul: KIDA, 2008), p. 280.
22. International Institute for Strategic Studies, *The Military Balance 2009* (London: Routledge, 2009), pp. 396-98.
23. Im Jong-in, "Year 2004 Parliamentary Audit," vol. 1 (in Korean) (2004), p. 90.
24. *Hankuk Ilbo*, August 31, 2004.

assessment.[25] In fact, O'Hanlon and Suh, along with Hamm and Suh, have all concluded that the South alone could cope with North Korea's offensive attacks even without American military support.[26]

Despite the efforts by South Korea's military establishment to overestimate North Korea, overall conventional defense capabilities favor South Korea. But South Korea remains concerned about some of North Korea's asymmetric military assets. A South Korean National Assemblyman has recently requested each of the armed services to identify North Korea's five most dangerous conventional weapons in order of size of the threat. The army identified the KN-02 short range ballistic missiles (range 210 km.), 240 mm. multiple retrievable launchers (range 60 km.), 170 mm. self-propelled multiple launchers (range 50 km.), 122 mm. multiple launcher (range 20 km.), and the *Cheonmaho* tanks. Meanwhile, the navy identified submarines, ground-to-surface guided missiles SS-N-4, STXY surface-to-surface guided missiles (range 45 km.), torpedo boats, and guided missile launching boats. In somewhat of an anomaly, the air force chose outdated airplanes such as the AN-2 light transport plane, the IL-28 bomber, and the MiG 21, 19, 17.[27] On the whole, while the short-range ballistic missiles and multiple launchers can cause critical damage, especially to the Seoul metropolitan area, the other weapons identified are likely to incur only tactical impact, which can largely be countered by South Korea's existing conventional forces.

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25. Hamm Taik-young and Suh Jae-Jung, "North Korea's Military Capability and the Balance between the South and the North" (in Korean), in the Graduate School of North Korean Studies, Kyungnam University, ed., *Recasting the Question of North Korean Military* (Paju, ROK: Hanul, 2006), p. 354.
26. Ibid., pp. 376-410; Michael E. O'Hanlon, "Stopping a North Korean Invasion: Why Defending South Korea Is Easier Than the Pentagon Thinks," *International Security*, vol. 22, No. 4 (1998), pp. 153-56; Suh Jae-Jung, "Blitzkrieg or Sitzkrieg? Assessing a Second Korean War," *Pacific Review*, vol. 11, No. 2 (1999), pp. 151-76.
27. *Yonhap News*, October 5, 2009.

## WMD and a New Spiral of the Arms Race on the Korean Peninsula

Even a cursory comparative examination reveals that the South is far superior to the North in terms of conventional capabilities, especially when ROK-U.S. combined forces are taken into account. North Korea's response has been the development of asymmetric forces, especially weapons of mass destruction (WMD). It is quite likely that the North chose nuclear armament as a way of coping with its inferiority in conventional forces. In light of the widening economic and conventional forces gap, the North may have regarded the nuclear weapons card as the most economical and effective option.

### *Nuclear Warheads and Missiles*

What, then, is the status of North Korea's nuclear weapons capability? In order for a country to become a nuclear weapon state, the country has to satisfy four conditions: possession of nuclear warheads, deployment of workable missiles, success in nuclear testing, and the acquisition of miniaturization technology. Since the second nuclear standoff in 2003, North Korea is not only known to have reprocessed 8,060 spent fuel rods stored in a water pond, but also additional spent fuel rods obtained from reactivation of its 5 MW reactor in Yongbyon. Estimates of North Korea's plutonium (PU) bombs vary, but it is estimated that reprocessing of the 8,060 spent fuel rods stored in a cooling pond should have yielded one or two bombs. Reactivation of the 5 MW reactor is believed to have allowed the manufacture of 5-6 PU warheads from the production of 44-52 kilograms of PU.[28] As of April 2009, North Korea is estimated to have produced about 40-50 kilograms of plutonium and to have acquired five to ten

28. David Albright, "North Korean Plutonium Production," *Science & Global Security*, vol. 5 (1994), p. 78; Center for Nonproliferation Studies at Monterey Institute of International Studies, "North Korean Nuclear Capabilities," www.nti.org/db/profiles/dprk/msl/msl_overview.html; *Yonhap News*, January 2, 2006.

nuclear weapons.[29]

Some have projected that North Korea may have been capable of producing 75 kilograms of highly enriched uranium (HEU) annually starting in 2005, which would be sufficient to manufacture three HEU weapons every year.[30] Despite wild speculations on North Korea's HEU-related programs and the North's purported admission of development, no hard evidence on acquisitions has yet been presented. North Korea may have acquired some parts and components of an HEU program such as gas centrifuges and high strength/quality aluminum tubes, but it is likely to be short of establishing a complete HEU program and actual bombs.[31] Thus, it is highly unlikely that North Korea possesses actual HEU programs and bombs. Nevertheless, North Korea has at the very least acquired plutonium bombs, satisfying the first precondition of possession of nuclear warheads.

The capability to deliver them is another precondition. North Korea has so far proved that it has credible short- and middle-range delivery capability. It currently possesses several types of missiles: *Scud B* (range 320 kilometer, payload 1,000 kilograms), *Scud C* (range 500 kilometer, payload 770 kilograms), and *Nodong* (range 1,350-1,500 kilometers, payload 770-1,200 kilograms).[32]

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29. *Kyunghyang Shinmun*, April 27, 2009. North Korean officials told Selig Harrison, who visited North Korea in January, that the North "weaponized" enough plutonium for four to five nuclear bombs. *New York Times*, January 18, 2009.
30. Jon B. Wolfsthal, "Estimates of North Korea's Unchecked Nuclear Weapons Production Potential," Non-proliferation Project, Carnegie Endowment for International Peace, www.carnegieendowment.org/static/npp/NK_nuclear_weapon_production_potential.pdf; Fred McGoldrick, "The North Korea Uranium Enrichment Program: A Freeze and Beyond," working papers of the Nautilus Institute for Security and Sustainability, No. 38 (June, 2003).
31. See David Albright, "North Korea's Alleged Large-Scale Enrichment Plant: Yet Another Questionable Extrapolation Based on Aluminum Tubes," *ISIS Report*, February 23, 2007, at www.isis-online.org/publications/dprk/DPRKenrichment22Feb.pdf; Lee Choon Geun and Kim Jong-seon, "North Korea's Development of Nuclear and Rocket Technology" (in Korean), *STEPI Insight*, vol. 22 (May 15, 2009), p. 8.
32. See International Institute for Strategic Studies, *North Korea's Weapons*

But three test-launchings of intercontinental ballistic missiles—*Daepodong-1* missile (range 1,500-2,500 kilometers, payload 1,000-1,500 kilograms) on August 31, 1998, *Daepodong-II* missile (range 3,500-6,000 kilometers, payload 700-1,000 kilograms) on July 6, 2006, and a similar one on April 5, 2009—are all believed to have failed. In view of this, although North Korea has not yet developed long-range missiles capable of threatening the mainland United States, it does have the ability to cause considerable damage to South Korea and Japan with its short- and medium-range missiles.[33]

### *Nuclear Testing and Technology*

With respect to nuclear testing, North Korea has undertaken two underground nuclear tests, one on October 9, 2006 and the other on May 25, 2009. Despite North Korea's claims, most international nuclear experts believe that its first nuclear testing failed because the explosive yield measured by seismic analysis was quite low, only 0.5-0.8 kilotons. Given that the lowest explosive yield in recent years was 19 kilotons, which came from the Pakistani nuclear testing in 1998, and that the nuclear bomb that destroyed Hiroshima on August 6, 1945 was roughly 15 kilotons, a sub-kiloton yield cannot be considered successful. Jungmin Kang and Peter Hayes, leading observers of the North Korean nuclear issue, make the following evaluation: "The DPRK might believe that a half kiloton 'mininuke' still provides it with a measure of nuclear deterrence and compellence; but it could not rely on other nuclear weapons states to perceive it to have anything more than an unusable, unreliable, and relatively small nuclear explosive device."[34] However, its second nuclear testing

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*Programmes: A Net Assessment* (London: IISS, 2004), pp. 63-84.

33. Lee and Kim, "North Korea's Development."
34. Jungmin Kang and Peter Hayes, "Technical Analysis of the DPRK Nuclear Test," Nautilus Institute, www.nautilus.org/fora/security/0689HayesKang.html, October 20, 2006, p. 1. Also see IISS, "North Korea's Nuclear Test: Continuing Reverberations," *IISS Strategic Comments*, vol. 12, No. 8 (October 8, 2006).

proved to be successful, and the North formally announced that it had become the ninth nuclear weapon state.

While North Korea has at present fulfilled three of the four criteria of a nuclear state, specialists believe that the North has not yet acquired the miniaturization technology to mount nuclear warheads on *Nodong* and/or *SCUD* missiles for effective use. Thus, it might be premature to treat North Korea as a full-fledged nuclear weapon state. Nevertheless, it continues to pursue that goal in a methodical way.

North Korea has generated concerns not only with its nuclear aspirations but with bio-chemical weapons as well. Although North Korea joined the Biological and Toxin Weapons Convention (BWC) in 1987, the *Defense White Paper 2008* estimates that the North has stored 2,500 to 3,000 metric tons of chemical agents in various facilities and that it has the capability to produce biological weapons using anthrax, smallpox, and cholera agents.[35] However, several experts have pointed out that the improper use of these weapons could backfire against the North and limit its combat effectiveness.[36] Thus, at present, the nuclear threat seems more urgent.

### *South Korea's Response*

South Korea's response to the nuclear threat has been two-fold. One is to seek an American nuclear umbrella within the framework of the ROK-U.S. alliance, and the other is to further enhance its overall conventional defense capabilities. While the United States has consistently assured the former with the application of extended deterrence, the latter has been undertaken through a more systematic introduction and implementation of the Revolution in Military Affairs (RMA). It was the Kim Dae-jung government (1998-2003) that first officially adopted RMA.

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35. ROK Ministry of National Defense, *The Defense White Paper 2008*, pp. 39-40; North Korea Advisory Group, "Report to the Speaker, U.S. House of Representatives" (November 1999).
36. O'Hanlon, "Stopping a North Korean Invasion," p. 165; Hamm and Suh, "North Korea's Military Capability," p. 373.

On April 15, 1998, immediately after its inauguration, the Kim Dae-jung government launched the Committee for the Promotion of Defense Reform and established the Five-Year Defense Reform Plan in accordance with the Basic Defense Policy Report. The committee identified three goals: creation of the most capable standing army; expansion of an information technology-intensive military armed with cutting-edge weapons; and construction of a rational, effective, and economical military.[37]

The Kim Dae-jung government introduced several initiatives to realize these goals. First, it pushed for organizational reforms by creating new unified national command systems in the fields of transportation and biochemical and nuclear defense, as well as improving acquisition systems in the Joint Chiefs of Staff (JCS). Second, a greater emphasis was placed on applying the latest information technologies to the defense sector. Finally, the Kim government began to expedite the acquisition of defense assets closely related to network-centric warfare and surveillance and strike capabilities, while the army, navy, and air force concurrently began to acquire future-oriented, cutting-edge weapons systems.[38]

The Roh Moo-hyun government continued such efforts by drafting the Defense Reform 2020 plan, which aimed at assuring a self-reliant advanced national defense through the creation of a technology-intensive military structure and future-oriented defense capability.[39] Two critical factors affected the nature and direction of the plan. One was the return of wartime operational control from the United States to South Korea, and the other was South Korea's improved science and technology capabilities. Whereas the former emphasized "independence" or "self-reliance," the latter framed defense reform around speed, stealth, accuracy, and networks. Four major tasks have been identified to carry out the plan: securing military structure and defense capabilities

37. Ministry of National Defense, *National Defense Policy 1998-2002* (in Korean) (Seoul: MND, 2002), pp. 25-31.
38. Ibid., pp. 39-46.
39. This section draws on Moon and Lee, "Revolution in Military Affairs," pp. 117-34.

corresponding to contemporary warfare; expanding the role of civilians in the defense establishment; innovation for a low-cost/high-efficiency national defense management system congruent with a cutting-edge information-intensive military; and the improvement of soldiers' barracks life.[40]

The hallmark of Defense Reform 2020 was the qualitative transformation of the South Korean military. It aimed at reducing the current number of armed forces from 650,000 to 500,000 by 2020, while giving priority to the introduction of new capital- and technology-intensive military structure. The army was the primary victim of the reform since it faced the most manpower reduction. Nevertheless, its combat capabilities were expected to improve considerably with the acquisition of UAVs for reconnaissance, next-generation tanks and infantry fighting vehicles, attack helicopters (KHP), improved fire systems, and a simplified command structure. The navy and the air force were the plan's principal beneficiaries. The navy would be able to extend its capabilities beyond that of a coastal navy by securing both a submarine command and a naval air command. The navy acquired its first *Aegis* destroyer in 2007 and will continue to upgrade its combat capability by securing the KDX-3 (7,000 ton-class *Aegis* destroyer) and middle-sized submarines (1,800 ton-class). The air force will continue to upgrade its fighting capability through the acquisition of F-15Ks, FA-50s, SAM-X, a wide array of airborne missiles, including JASSM, and airborne early warning systems (E-X).

The most crucial aspect of the plan was the massive investment in battle management assets focusing on command, control, communication, computer, intelligence, surveillance and reconnaissance (C4ISR), all of which are essential for network-centric warfare. Along with this, the Defense Reform 2020 has mandated the acquisition of theater operational command facilities, military communication satellites, tactical information com-

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40. See ROK Ministry of National Defense, *The National Defense White Paper 2006*, pp. 36-37; ROK Ministry of National Defense, *Implementation of Defense Reform 2020* (in Korean) (Seoul: MND, 2006).

munication networks (TICN), the Joint Tactical Data Link System (JTDLS), and the Korea Joint Command and Control System (KJCCS).[41]

North Korea most likely regards as threatening such an immense buildup of cutting-edge weapons with lethal precision and advanced equipment related to C4ISR. However, we cannot detect any new movement on its part to acquire additional advanced weapons and equipment. An acute shortage of hard currency and international isolation has prevented the North from improving its conventional defense capabilities. Since the early 1990s, North Korea's acquisition of foreign weapons has been greatly constrained. In this context the North has embraced the logic of nuclear deterrence.

## Accounting for Inter-Korean Military Spending and Arms Racing

In the earlier part of this article, we identified four major factors that drive defense spending and arms races: external threats, domestic politics, alliance effects, and macro-economic conditions. How have they influenced the dynamics of inter-Korean military spending?

Although South Korea has used the North Korean threat to justify its military spending, the interaction effects envisaged by Richardson have remained rather minimal. Defense spending in the South did not respond to that of North Korea. Regardless of the latter's spending pattern, South Korea continued to increase its defense spending with few exceptions. The South tends to regard the threat from the North as constant. As such, a routine bureaucratic incrementalism has become a major variable affecting the level of defense spending. In fact, most countries do not practice a zero-based budgeting system, which allows bureaucrats to enjoy discretionary power for incremental budget increases. South Korea has not been an exception to this inertia-

41. ROK MND, *Implementation of Defense Reform 2020*.

driven defense spending pattern.

However, bureaucratic incrementalism cannot account for an abrupt rise or fall in defense spending. What appears to matter most in defense spending is overall macro-economic conditions. The Chun Doo-hwan government cut the relative share of defense spending, albeit an alliance obligation with the United States, because of IMF conditionalities requiring macro-economic stabilization. President Kim Dae-jung had to trim the defense budget because of the financial crisis that started in 1997. Despite its emphasis on national security, the Lee Myung-bak government cut the defense budget to cope with economic difficulties followed by the global financial crisis in 2008. This implies that macro-economic conditions delimit the overall boundary of expansion and reduction. Generally good economic conditions have accompanied an increase in defense budget, and bad conditions have led to a decrease.

Alliance effects also appear to have profound impacts on defense spending.[42] When there was a strong U.S. security commitment, South Korea's defense spending was minimal. But when the United States showed signs of disengagement or waning security commitment, South Korea proceeded to increase its defense spending. For example, the reduction of American forces in South Korea through the withdrawal of its Seventh Infantry division in 1971 prompted the Park government to increase rapidly its defense budget in the early 1970s. The phenomenal rise in defense spending from 1976 to 1979 can also be explained by alliance effects, as South Korea allocated six percent of its GNP as part of compliance with American demands for defense burden-sharing. The unexpected rise in defense spending during the progressive Roh Moo-hyun government was also closely related to alliance effects. Roh's efforts to seek a more independent military line by reducing dependence on the U.S. led to an increase in the ROK's military budget. Conversely, the conserva-

42. Chung-in Moon and In-Taek Hyun, "Muddling through Security, Growth, and Welfare: The Political Economy of Defense Spending in South Korea," in Steve Chan and Alex Minz, eds., *Defense, Welfare, and Growth* (London: Routledge, 1992), pp. 146-48.

tive Lee government's decision to reduce the defense budget is known to have been predicated on the restoration of strong alliance ties with the United States. Thus, the alliance factor has proven central to the patterns of defense spending in South Korea.

Domestic political variables seem to have a mixed impact. During normal and peaceful periods, bureaucratic inertia dictated budgetary outcomes, minimizing the scope of annual sectoral variation. Given the predominance of the army in the Korean force structure, a balanced allocation of defense budget among three armed services is virtually inconceivable. Thus, there is no room for flexible adjustment, and rigidity characterizes the budgetary process. We also argue that societal pressures on the defense budget are fundamentally limited. This does not mean to suggest that South Korea lacks elements of the military-industrial complex. Military officers, the Agency for Defense Development (ADD), defense contractors, import agents, and conservative NGOs have been strong supporters of increased defense spending and improved defense capability. But their vertical and horizontal links are rather loose, and their lobbying activities are banned by law. Thus, their influence seems rather minimal. Moreover, liberal civic organizations that oppose the expansion of defense spending have been gaining political power since the democratic opening in 1987.

But what counts most in the domestic political landscape is executive leadership. Defense spending has, by and large, been shaped by the political leader's preference and style. Although the overall security environment has mattered, Park Chung-hee's commitment to over-spending and Kim Dae-jung's preference for less spending can be accounted for by leadership preference and style.[43]

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43. Oh Won-chul, *The South Korean-type Economic Development: Engineering Approach*, vol. 5 (in Korean) (Seoul: the Kia Economic Institute, 1996); Moon and Hyun, "Muddling through Security, Growth, and Welfare," pp. 148-50; Lee Kyung Soo, "A Comparative Study on 'Self-Reliant Defense' Policy of Park & Rho's Regimes" (in Korean), (Ph.D. dissertation, Sungkyunkwan University, 2007), pp. 103-87.

How about North Korea? The North did not respond to South Korea's defense spending as expected under the logic of interaction effects. Nonetheless, its threat perception has continued to shape its arms race behavior, if not its defense spending. In our view, North Korea's decision to go nuclear appears to be affected by two factors: its threat perception of American nuclear and combined ROK-U.S. conventional forces, and the need to seek the most economical way of dealing with such threats. Protracted poor economic conditions and difficulties in acquiring advanced weapons and equipment from foreign countries could have justified and fostered such behavior. The downsizing of the defense budget in the 1980s and the 1990s was closely related to economic hardship.

Interestingly, North Korea has rapidly increased its defense spending since 1998, in spite of continuing economic hardship. This could be explained in part by the interaction effect, since South Korea began RMA at this time. As noted before, despite new constraints emanating from democratization, the end of the cold war, and the financial crisis, the South Korean government continued to upgrade the qualitative nature of its defense forces through the adoption of RMA. Moreover, the Roh Moo-hyun government initiated the Defense Reform 2020 and began to strengthen its endogenous weapons development capability as well as to foster the acquisition of advanced weapons from abroad. North Korea had to respond to such changes in South Korea by increasing defense spending. Although shortages of hard currency fundamentally limited its efforts to improve the qualitative nature of its defense capability through the acquisition of advanced foreign weapons, an increase in its defense budget allowed the North not only to make a quantitative response through the expansion of existing weapons stock but also to address some chronic problems such as poor supply of parts and components of military equipment and the deteriorating welfare of soldiers.[44]

North Korea's rapid increase in defense spending can also

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44. Lee, *North Korean Soldiers*, pp. 261-65.

be explained in part by the adoption of "military-first politics" (*seongun jeongchi*) for the creation of "a strong and prosperous great nation" (*gangseong daeguk*), both of which were initiated by Kim Jong Il. The military in the North, including the second economy (defense-related economy), has long been a principal beneficiary of preferential budget allocation not only because of the military's power, but also because Kim Jong Il elevated its status under the rubric of "military-first politics."[45] As matter of fact, the military-first doctrine has helped sustain a relatively large workforce in the defense sector as well as prop up military industries.[46] Given that North Korea does not have any alliance comparable to that of the ROK-U.S., the alliance-effects hypothesis may not be applicable. Historically speaking, however, North Korea's defense spending used to be affected by the varying nature of its security ties with China and the Soviet Union. When military assistance from these two countries was robust, North Korea's defense spending rose slowly, whereas it increased rapidly when such assistance was withheld.[47]

## Conclusion

The two Koreas are still engaged in a protracted arms race, jeopardizing peace and stability on the Korean peninsula and in the region. Such an arms race is no longer limited to conventional forces. As North Korea deliberates on a risky nuclear armament, the security situation is getting worse. Failure to block North Korea's full-fledged nuclearization could set off a nightmarish

45. Hwang Jang-yop, *The Truth and Falsity of North Korea* (in Korean) (Seoul: Sidaejeongsin, 2006), pp. 16-53; Hyun Sung-il, *The National Strategies and Elite of North Korea: Focusing on Policies on Cadres* (in Korean) (Seoul: Seonin, 2007), pp. 282-83.
46. See John Feffer, "Ploughshares into Swords: Economic Implications of South Korean Military Spending," *KEI Academic Paper Series*, vol. 4, No. 2 (February, 2009).
47. Sung, "The Economic Base of North Korea's Defense Capability," pp. 323-35; Kim, "The Political Economy of North Korea's Industrialization," pp. 74-79.

nuclear domino effect in the region, which no one wants. Consequently, North Korea's nuclear ambition should be thwarted, and reducing the threat environment through a peace regime on the Korean peninsula is the surest way to a "nuclear-free Korea."

A peace regime in Korea should start with essential steps such as inter-Korean military confidence-building measures, arms control, reduction in conventional forces, and the transformation of the armistice agreement into a viable peace architecture. Efforts to dismantle the cold-war structure prevailing in the region should be undertaken in tandem. U.S.-DPRK and Japan-DPRK diplomatic normalization are the most critical elements. The formation of a multilateral security cooperation mechanism in Northeast Asia can facilitate such a process. Contrived threats, increased defense spending, and a futile conventional and nuclear arms race can no longer be justified. It is time to create momentum for sustainable peace and common prosperity on the Korean peninsula and in the region.

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