Korean Peninsula Military Modernization Trends

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VI. Korean Peninsula Military Modernization Trends

Military modernization efforts are a key variable when assessing the Korean Peninsula, and one where the shifting strategies and military efforts of the US and China play an increasingly important role. The modernization trends of all the countries involved in the region have great significance in determining the types of engagement that could be fought. Modernization affects deterrence and assessments of the potential course of any engagement, as well as estimate of types of forces the US needs to commit to the region, both in times of peace and in times of tension.

There are serious limits to the unclassified data available for comparisons of Northeast Asian military modernization – especially for China and the DPRK. Unclassified sources do not include many smart munitions, they only cover a limited amount of other weaponry, and they do not reflect investments in logistics and transport. They also often do not include battle management, ISR, or Command, Control, Communications, and Computer (C4) assets. These are becoming steadily more critical aspects of military modernization.

Later in this section, Figure VI.1 to Figure VI.5 do show, however, that the ROK has modernized more rapidly and with more advanced equipment than the DPRK, while Pyongyang has focused on force expansion. The ROK has almost achieved a massive lead in modern aircraft and surface-to-air missiles. The figures also show that the ROK has an effective plan for force modernization through 2020 – a plan it has upgraded since 2005. There is no unclassified DPRK equivalent.

DPRK

The DPRK has limited economic means to support modernization and force expansion. As previously discussed, the CIA estimated in August 2016 that the DPRK had a 2013 GDP of approximately $28 billion, while the ROK’s 2014 GDP was approximately $1.802 trillion. The DPRK had an estimated GDP per capita of $1,800, while the ROK’s GDP per capita was about $35,700. This estimate made the ROK’s GDP 64 times larger than the DPRK’s, and the ROK’s GDP 20 times larger.¹

This disparity, however, has not stopped the DPRK’s regime from devoting major resources to force expansion and modernization. The first annual DOD unclassified report on North Korean forces was issued in May 2013. The second report, released February 2014, described the DPRK’s modernization programs as follows:²

North Korea’s force modernization goals are aimed at maintaining the credibility of its conventional forces through more realistic training and the modest production of new systems; enhancing the credibility of its strategic deterrence by advancing its nuclear and missile programs; and developing new or improved means to support its coercive diplomacy – most notably via its cyber and missile programs. North Korea directs its limited resources to areas where it sees the potential for localized comparative advantage...
**DPRK Modernization Priorities**

Kim Jong Un gives high priority to the development of new weapons systems, as demonstrated by his numerous appearances with military units and research and development organizations. He has personally overseen land- and sea-based ballistic missile and anti-ship cruise missile testing activity in 2014 and 2015. Additionally, he oversaw events designed to demonstrate the proficiency of his conventional military forces.

The 2015 Department of Defense Report on the DPRK notes the military’s emerging capabilities: 3

The Korean People’s Army (KPA) — a large, ground force-centric organization comprising ground, air, naval, missile, and SOF — has over one million soldiers in its ranks, making it the fourth largest military in the world. Four to five percent of North Korea’s 24 million people serve on active duty, and another 25 to 30 percent are assigned to a reserve or paramilitary unit and would be subject to wartime mobilization. With approximately 70 percent of its ground forces and 50 percent of its air and naval forces deployed within 100 kilometers of the DMZ, the KPA poses a continuous threat to the ROK and U.S. forces stationed there. The general disposition of the KPA has not changed in the last two years.

The KPA primarily fields legacy equipment, either produced in or based on designs from the Soviet Union and China dating back to the 1950s, 1960s, and 1970s. Although a few weapons systems are based on modern technology, the KPA has not kept pace with regional military capability developments. The KPA has not acquired new fighter aircraft in decades, relies on older air defense systems, lacks ballistic missile defense, its Navy does not train for blue water operations, and recently unveiled artillery systems include tractor-towed rocket launchers while most other countries are improving the mobility of such systems.

Kim Jong Un seems to prioritize the development of new weapons systems, as demonstrated by his numerous appearances with military units and research and development organizations. He has personally overseen land- and sea based ballistic missile and anti-ship cruise missile testing activity in 2014 and 2015. He has also overseen events designed to demonstrate the proficiency of his conventional military forces.

**Ground.** The KPA’s ground forces are predominantly regular and light infantry units, supported by armor and mechanized units and heavy concentrations of artillery. These forces are forward-deployed, fortified in several thousand underground facilities, and include long-range cannon and rocket artillery forces that are capable of reaching targets in Seoul from their garrisons.

The ground forces possess numerous light and medium tanks, and many armored personnel carriers. The KPA’s large artillery force includes long-range 170-mm guns and 240-mm multiple rocket launchers (MRL), many deployed along the DMZ posing a constant threat to northern parts of the ROK.

In October 2015, North Korea paraded what appears to be a large-caliber MRL — larger than its 240-mm MRL — that carries eight tubes on a wheeled chassis. In recent years, North Korea has unveiled other new ground force equipment, including tanks, artillery, armored vehicles, and infantry weapons. The display of these systems shows that North Korea continues to produce, or at least upgrade, limited types and numbers of military equipment.

**Air and Air Defense.** The North Korean Air Force (NKAF), a fleet of more than 1,300 aircraft that are primarily legacy Soviet models, is primarily responsible for defending North Korean air space. Its other missions include SOF insertion, transportation and logistics support, reconnaissance, and tactical air support for KPA ground forces. However, because of the technological inferiority of most of its aircraft fleet and rigid air defense command and control structure, much of North Korea’s air defense is provided by surface-to-air missiles (SAMs) and antiaircraft artillery (AAA).

The NKAF’s most capable combat aircraft are its MiG-29s, procured from the Soviet Union in the late 1980s, its MiG-23, and its SU-25 ground-attack aircraft. However, the majority of its aircraft are less capable MiG-15s, MiG-17s, MiG-19s (F-6), and MiG-21s. The NKAF operates a large fleet of An-2 COLT aircraft, which are 1940s vintage single-engine, 10-passenger biplanes, likely tasked with inserting
SOF into the ROK. The Air Force is rounded out with several hundred helicopters that would be used for troop transport and ground attack, including predominantly Mi-2/HOPLITE and some U.S.-made MD-500 helicopters obtained by circumventing U.S. export controls in 1985.

North Korea possesses a dense, overlapping air defense system of SA-2, SA-3, and SA-5 SAM sites, mobile SA-13 SAMs, mobile and fixed AAA, and numerous man-portable air-defense systems like the SA-7. As the NKAF’s aircraft continue to age, it increasingly relies on its ground-based air defenses and on hiding or hardening assets to counter air attacks. During a 2010 military parade, North Korea displayed a new mobile SAM launcher and accompanying radar, which bore external resemblance to the Russian S-300 and Chinese HQ-9.

North Korea publicized a March 2013 military live-fire drill that for the first time featured an unmanned aerial vehicle (UAV) in flight. The UAV appeared to be a North Korean copy of a Raytheon MQM-107 Streaker target drone. North Korean press coverage of the event described the UAV as being capable of precision strike by crashing into the target. The drill also featured the UAV as a cruise-missile simulator, which was then shot down by a mobile SAM.

Naval. The North Korean Navy (NKN) is the smallest of the KPA’s three main services. This coastal force is composed primarily of numerous, though aging, small patrol craft that carry a variety of anti-ship cruise missiles, torpedoes, and guns. The NKN maintains one of the world’s largest submarine forces, with around 70 attack-, coastal-, and midget-type submarines. In addition, the NKN operates a large fleet of air-cushioned hovercraft and conventional landing craft to support amphibious operations and SOF insertion. The force is divided into East and West Coast Fleets, which each operate a variety of patrol craft, guided-missile patrol boats, submarines, and landing craft.

The NKN has displayed limited modernization efforts, highlighted by upgrades to select surface ships and a continued program to construct submarines. North Korea unveiled a new submarine in mid-2015, which it claims was developed domestically and can fire a ballistic missile.

Special Operations Forces. North Korean SOF are among the most highly trained, well-equipped, best-fed, and highly motivated forces in the KPA. As North Korea’s conventional capabilities decline relative to the ROK and United States, North Korea appears to increasingly regard SOF capabilities as vital for asymmetric coercion.

Strategic SOF units dispersed across North Korea appear designed for rapid offensive operations, internal defense against foreign attacks, or limited attacks against vulnerable targets in the ROK as part of a coercive diplomacy effort. They operate in specialized units, including reconnaissance, airborne and seaborne insertion, commandos, and other specialties. All emphasize speed of movement and surprise attack to accomplish their missions. SOF may be airlifted by An-2 COLT or helicopters (and possibly Civil Air Administration transports), moved by maritime insertion platforms, or travel on foot over land or via suspected underground, cross-DMZ tunnels to attack high-value targets like command and control nodes or air bases in the ROK.

Ballistic Missile Force. North Korea has several hundred short- and medium-range ballistic missiles (SRBMs and MRBMs) available for use against targets on the Korean Peninsula and Japan. A developmental intermediate-range ballistic missile (IRBM), though untested and unreliable as a weapon, could also be launched at targets in the region.

North Korea has an ambitious ballistic missile development program in addition to its deployed mobile theater ballistic missiles. Since early 2012, North Korea has made efforts to raise the public profile of its ballistic missile command, now called the Strategic Rocket Forces. In 2014, Kim Jong Un personally oversaw several ballistic missile launch exercises, and North Korea launched an unprecedented number of ballistic missiles. The State media covered the usually secretive events, including reporting on two launch cycles in the same week. Kim’s public emphasis of the missile force continued into 2015, when he appeared at what North Korea portrayed as the test launch of a submarine-launched ballistic missile
(SLBM). In late November 2015, the ROK’s Yonhap news agency reported that North Korea appeared to conduct an SLBM test but it ended in failure with no indication that the missile successfully ejected from the vessel.

North Korea is committed to developing a long-range, nuclear-armed missile that is capable of posing a direct threat to the United States. Pyongyang displayed the KN08 ICBM, which it refers to as Hwasong-13, on six road-mobile transporter-erector launchers (TEL) during military parades in 2012 and 2013. If successfully designed and developed, the KN08 likely would be capable of reaching much of the continental United States, assuming the missiles displayed are generally representative of missiles that will be fielded. However, ICBMs are extremely complex systems that require multiple flight tests to identify and correct design or manufacturing defects. Without flight tests, the KN08’s current reliability as a weapon system would be low. In October 2015, North Korea paraded four missiles on KN08 TELs. These missiles are noticeably different from those previously displayed on these TELs.

North Korea also continues to develop the TD-2, which could reach the continental United States if configured as an ICBM. In April and December 2012, North Korea conducted launches of the TD-2 configured as a SLV, which used ballistic missile technology. The April launch failed but the December launch succeeded.

Developing an SLV contributes heavily to North Korea’s long-range ballistic missile development, since the two vehicles have many shared technologies. However, a space launch does not test a reentry vehicle (RV). Without an RV capable of surviving atmospheric reentry, North Korea cannot deliver a weapon to target from an ICBM.

Advances in ballistic missile delivery systems, coupled with developments in nuclear technology discussed in Chapter 4, are in line with North Korea’s stated objective of being able to strike the U.S. homeland. North Korea followed its February 12, 2013 nuclear test with a campaign of media releases and authoritative public announcements reaffirming its need to counter perceived U.S. hostility with nuclear-armed ICBMs. North Korea continues to devote scarce resources to these programs, but the pace of its progress will also depend, in part, on how much technology and other aid it can acquire from other countries.

**Cyberwarfare Capabilities.** North Korea has an offensive cyber operations (OCO) capability. Implicated in malicious cyber activity and cyber effects operations since 2009, North Korea probably views OCO as an appealing platform from which to collect intelligence and cause disruption in South Korea and other adversaries including the United States. North Korea likely views cyber as a cost-effective, asymmetric, deniable tool that it can employ with little risk from reprisal attacks, in part because its networks are largely separated from the Internet and disruption of Internet access would have minimal impact on its economy. On November 24, 2014, North Korean cyber actors using the name “Guardians of Peace” attacked Sony Pictures Entertainment, shutting down employee access and deleting data. As a result of North Korea’s historical isolation from outside communications and influence, it is likely to use Internet infrastructure from third-party nations.

**Intelligence Services.** North Korean intelligence and security services collect political, military, economic, and technical information through open-source, human intelligence, cyber, and signals intelligence capabilities. North Korea’s primary intelligence collection targets remain South Korea, the United States, and Japan.

The Reconnaissance General Bureau (RGB) is North Korea’s primary foreign intelligence service, responsible for collection and clandestine operations. The RGB is comprised of six bureaus with compartmented functions including operations, reconnaissance, technology and cyber, overseas intelligence, inter-Korean talks, and service support.

The Ministry of State Security (MSS) is North Korea’s primary counterintelligence service and is an autonomous agency of the North Korean government reporting directly to Kim Jong Un. The MSS is
responsible for operating North Korean prison camps, investigating cases of domestic espionage, repatriating defectors, and conducting overseas counterespionage activities in North Korea’s foreign missions.

The United Front Department (UFD) overtly attempts to establish pro-North Korean groups in South Korea such as the Korean Asia-Pacific Committee and the Ethnic Reconciliation Council. The UFD is also the primary department involved in managing inter-Korean dialogue and North Korea’s policy toward South Korea.

The 225th Bureau is responsible for training agents to infiltrate South Korea and establishing underground political parties focused on fomenting unrest and revolution.

Command, Control, and Communications. North Korea’s National Defense Commission (NDC) is the official authority over the North’s military and security services. The Ministry of People’s Armed Forces (MPAF) is the administrative superior of the KPA, while operational command and control is exercised by the General Staff Department. The 1992 constitution gives control of North Korea’s military to the NDC, and Kim Jong Un exercises control of the military as “First Chairman” of the NDC and “Supreme Commander” of the KPA. Kim Jong Un further exercises control as “First Secretary” of the Korean Worker’s Party (KWP) and “Chairman” of the KWP’s Central Military Commission.

North Korea has a nationwide fiber-optic network, and has invested in a modern nationwide cellular network. However, telecommunication services and access are strictly controlled and all networks are available for military use, if necessary.

Cell phone subscribership reportedly exceeds three million nationwide with continued growth of Koryolink, a joint venture between Pyongyang and Egypt’s Global Telecom Holding. Mobile phone users are concentrated in major cities, with growth in small towns and villages. However, most cell phones cannot access the Internet and can only make domestic calls. In 2014, Orascom suggested the future of Koryolink was uncertain, in part because the North Korean Government had launched a competing cellular network. In addition, Global Telecom cited international sanctions and the absence of a free-floating currency exchange as impediments to the transfer of its profits out of North Korea. This could sour further investment by global investors into North Korea’s telecoms sector. The Government restricts most North Koreans from using the Internet, but some are able to access the national intranet, which is insulated from the World Wide Web. The intranet hosts government-approved websites, primarily to support academic research and government businesses.

Outside sources also assess the DPRK’s modernization efforts as having a high priority within the limits imposed by its weak economy and technology base. For example, *Jane’s World Armies* reported in 2014 that the DPRK had initiated a wide range of efforts in reorganization, reequipping, forward deployment, restructuring, and upgrading of forces since 1995. It reports that the KPA slowly worked to mechanize its forces starting in 1998, in particular the artillery. Key developments included:

> The production and deployment of small numbers of new tanks and long-range self-propelled artillery systems (240 mm and 300 mm multiple rocket launchers (MRL), 170 mm self-propelled guns, etc.); the restructuring of two mechanized corps, one tank corps and one artillery corps into divisions; the expansion of existing light infantry units, the establishment of a number of mechanized/motorized light infantry brigades and the conversion of the Ballistic Missile Testing Guidance Bureau into the Strategic Rocket Forces Command.

*Jane’s* also noted KPA acquisition and possible production of lasers:

Since the 1990s, and possibly earlier, the KPA has employed both laser range-finding and laser-designating equipment. In March 2003, however, the KPA demonstrated a new capability, employing a Chinese manufactured ZM-87 antipersonnel laser against two US Army Apache helicopters flying along the southern
side of the DMZ. While none of the crew members were injured, the ZM-87 is capable of causing serious injury to the human eye at 2-3 km and less serious injuries out to 10 km. It is unclear how, and when, the KPA acquired the ZM-87. It is unknown whether the DPRK is attempting to produce this or similar antipersonnel lasers. Defectors have identified the Mangyo Jewel Processing Factory, Man’gyongdae-ri, P’ongyang-si, as a facility that produces lasers for precision-guided weapons. It is likewise unknown if the acquisition or production is the responsibility of the First Machine Industry Bureau, a component of the Second Academy of Natural Sciences, or the Nuclear-Chemical Defence Bureau.

**Key DPRK Force Upgrades**

The DPRK has had to make hard choices in modernizing and expanding its forces, and has focused its resources on expanding and further developing its asymmetric warfare capabilities, including WMD, special operations forces, ballistic missiles, and electronic/information warfare. For the DPRK leadership, these capabilities can project a greater threat to the ROK, Japan, and U.S. forces at a smaller cost than conventional capabilities.\(^6\)

The recent annual threat assessments by the U.S. Director of National Intelligence (DPRK) and the Director of the Defense Intelligence Agency (DIA) have focused on the DPRK’s nuclear and ICBM threats. In his 2012 Global Threat Assessment, however, Director of the Defense Intelligence Agency Ronald L. Burgess Jr. questioned North Korea’s capability to modernize:\(^7\)

> North Korea’s large, forward-positioned military can attack South Korea with little or no strategic warning, but it suffers from logistic shortages, aging equipment, and poor training. It has attacked South Korean forces in/near disputed territories in the past and maintains the capability for further provocations. Pyongyang is making some efforts to upgrade conventional weapons, including modernizing certain aspects of its deployed missile forces – short-, medium-, and intermediate-range systems.

While much of this remains true, it is clear that North Korea is increasingly adept at circumventing the substantial roadblocks it faces for military modernization. This is exemplified by its continually improving missile, nuclear, and cyber capabilities.

The DPRK has deliberately pursued an asymmetric strategy to enhance its long-range strike capability against civilian and military targets to compensate for declining conventional capabilities. Specific attention has been focused on self-propelled artillery, multiple rocket launchers, and ballistic missiles.

More reliance has also been given to the Special Forces, tasked with stealthy infiltration of the ROK rear.\(^8\) According to the 2010 ROK White Paper, DPRK Special Forces have been augmented to 200,000 end-strength, up from 180,000 in 2008.

The DPRK has scarcely, however, halted its efforts to modernize its conventional forces. **Figure VI.1** provides a summary of DPRK modernization trends based on IISS data. **Figures VI.2 to VI.5** show how DPRK equipment trends compare with those of the ROK. In virtually every case, the DPRK has been able to acquire more systems than the ROK, though scarcely of the same quality.
## Figure VI.1: Key DPRK Equipment Modernization, 2000-2014

### Army

<table>
<thead>
<tr>
<th>Type</th>
<th>2000</th>
<th>2016</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBTs</td>
<td>3,500</td>
<td>3,500+</td>
<td>IISS reported no changes in DPRK MBT holdings but the 2010 ROK White Paper noted the introduction of the <em>Pokpung-Ho</em> (Storm Tiger), believed to be modeled on the T-72</td>
</tr>
</tbody>
</table>

### Air Force (and Air Defense)

<table>
<thead>
<tr>
<th>Type</th>
<th>2000</th>
<th>2016</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAMs</td>
<td>45 SA-2</td>
<td>179+ SA-2</td>
<td>Major reported increase in DPRK SAM holdings</td>
</tr>
<tr>
<td></td>
<td>7 SA-3</td>
<td>133 SA-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 SA-5</td>
<td>38 SA-5</td>
<td></td>
</tr>
<tr>
<td>Combat Aircraft</td>
<td>16 MIG-29 <em>Fulcrum</em></td>
<td>18+ MIG-29A/S <em>Fulcrum</em></td>
<td></td>
</tr>
</tbody>
</table>

### Navy

<table>
<thead>
<tr>
<th>Type</th>
<th>2000</th>
<th>2016</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submarines</td>
<td>26 SSK PRC Type-031/FSU <em>Romeo</em></td>
<td>I Sinpo with 1 KN-11 SLBM (underdevelopment)</td>
<td>Aggregate decrease in total DPRK submarines with 4 SSKs either retired or not operational in 2013, increase in SSC and SSW (midget) submarines North Korea has also been working to develop a ballistic missile launching sub</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 SSK PRC Type-031/FSU <em>Romeo</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 SSC Sang-O</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2+ SSC Sang-O II</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20+ SSW Yugo and Yeono</td>
<td></td>
</tr>
</tbody>
</table>

Source: All figures unless otherwise noted are based primarily on material in IISS, *The Military Balance 2016*. 
Figure VI.2: ROK Estimates of DPRK Equipment Trends from 2006 to 2014

DPRK

![DPRK Equipment Trends Chart]


ROK

![ROK Equipment Trends Chart]

Figure VI.3: ROK Estimates of DPRK and ROK Navy Equipment
Trends from 2006 to 2014

DPRK


ROK

Figure VI.4: ROK Estimates of DPRK and ROK Air Force Equipment Trends from 2006 to 2014

DPRK


ROK

ROK

The ROK provides a great deal more public data on its modernization, spending, and force development efforts. As a result, there are a wide range of useful South Korean and outside estimates of current trends.

**ROK Modernization Plans**

The ROK is committed to significant future defense reforms, especially in light of increased DPRK provocations over the past several years, and particularly in terms of military hardware. It has “obtained additional stealth air-to-surface missiles and advanced cluster bombs and is developing deep-penetrating ‘bunker-buster’ bombs capable of destroying fortified artillery in the event of a new shelling attack.” Furthermore, in fall 2012 the Defense ministry requested approximately 2.5 trillion won (about $2.1 billion) over a five-year period to improve missile capabilities.

Different sources broadly agree on the ROK’s progress, but emphasize different aspects. The 2013 *IISS Military Balance summarized these trends by saying that:*

> South Korea’s armed forces have to enhance deterrence; war-fighting and intelligence capabilities across the full range of contingencies vis-à-vis the North, while also taking into account the systematic military modernization of key neighboring powers.

> Moreover, as the armed forces prepare for the transfer of OPCON, the South Korea–US Combined Forces Command has to be reconfigured. At the same time, Seoul’s military intelligence, C4ISR, network-centric warfare, and cyber-security capabilities all require upgrades.

The 2016 *IISS Military Balance added that:* 

> South Korea’s primary military concern remains its troubled relationship with North Korea. This has led to a defence policy that seeks to recapitalise conventional military capabilities in order to maintain Seoul’s qualitative edge, whilst simultaneously pursuing the niche capabilities required to deter North Korea’s artillery, ballistic missile and littoral submarine threats. Military procurement is therefore currently both extensive and widely spread, and includes new armored vehicles and artillery, tactical and tanker aircraft, UAVs, precision munitions, ballistic and cruise missiles, satellites, and cyber- and missile-defence equipment. Whilst most of these acquisitions are from indigenous defence industry, the lengthy timelines of key programs such as Korean Air and Missile Defence (KAMD) and ‘Kill Chain’ (intended to give Seoul the ability to detect and destroy North Korean ballistic missiles prior to their launch) have led to imports of key items, such as Spike NLOS and Patriot PAC-3 missiles. The US alliance remains a key element of defence strategy, and the transfer of wartime operational control of forces to Seoul, planned for the end of 2015, has been delayed again, and will now be ‘conditions based’ with no firm date set.

In April 2016, *Jane’s Sentinel Security Assessment* highlighted the following ROK recent modernization efforts: 

In parallel developments with long-term implications, the RoKA is finally obtaining unqualified advantage over the North Korean People's Army (NKPA) in terms of modern weapons, widespread mechanization, and net-centric command, control, communications, and information (C3I), thereby permitting non-linear maneuver warfare as an alternative to the historical, bloody war of attrition in the mountains along the demilitarized zone (DMZ). However, modern maneuver and net-centric warfare require highly trained, capable, and motivated soldiers, which the RoKA is unlikely to adequately achieve with traditional conscription. The alternative - drastically reducing numbers of conscripts and building a leaner, more professional, and more lethal RoKA would be culturally painful for the army and society at large and no decision to take that route is likely, anytime soon. Meanwhile, two paramount issues loom over the immediate future of the country and the armed forces that require greater clarity - the state of the economy and the course of unfolding events in the DPRK.
Improvements in the national economy since 2013-14 have permitted a renewal of robust spending increases that had declined since 2009 in response to the global recession. Spending increases and major procurement programs across the armed forces are driven by rising concerns over North Korea’s unstable, nuclear-armed regime. Alert levels are now at their highest levels since the security crisis of the 1990s. Given multiple North Korean military provocations since 2010 and growing uncertainty over what the Pyongyang regime is capable of, the RoKA leadership is determined to maintain the trend towards building and maintaining an overwhelming qualitative edge over the NKPA that essentially blunts a land campaign southward across the DMZ towards Seoul. At the same time, the army has to be prepared to move north and secure North Korea either as a counter-offensive or in case the regime collapses.

**A Series of Defense Reform Plans and Modernization Efforts: 2005 Onwards**

The ROK’s modernization efforts have been shaped by a series of defense reform plans that have generally been driven by the DPRK’s actions. In 2005 the ROK MND released “The Defense Reform 2020 Initiative.” This plan was conceived during the Sunshine Policy era, and a key premise was that a decline in the threat of war from the DPRK military war threat meant that the number of ROK forces needed to balance this threat could be limited.

As a result, it outlined an ROK strategy to create a slimmer and more “self-reliant” military forces and that focused on technological improvements. The National Defense Reform Plan 2020 also focused on modernizing the military structure and force size and expanding the civilian base for national defense.

An estimate of the ROK’s modernization plans, made by Bruce Bennett of the RAND Corporation in 2006, is shown in detail in **Figure VI.5**. Some key goals that were first set forth in the “The Defense Reform 2020 Initiative” included procuring advanced aircraft and transforming a largely coastal patrol force into a blue-water navy. The ROK has focused on modernizing the Navy and Air Force to establish an omnidirectional military posture able to deal with all types of threats.

The Navy was to introduce domestically built destroyers, large transport ships, and submarines. The first mobile corps, with one Aegis-equipped vessel and six destroyers with plans for future expansion, was introduced in February 2010. The primary missions of these modernization efforts were to protect sea lanes, deter North Korea, and support the ROK’s external policies. The ROK Air Force is also likely to seek domestic missile production.

The ROK Air Force examined fielding F-15K fighters and developing a next-generation fighter program that included stealth capabilities, such as the KF-X fighter, a medium-sized two-engine aircraft similar to the Eurofighter Typhoon. As is noted later, progress was slow.
### Figure VI.5. Defense Reform 2020 (2005) Plans for ROK Modernization – Part One

**Comparison of the ROK Army, 2004 versus 2020**

<table>
<thead>
<tr>
<th>Force Type</th>
<th>2004</th>
<th>2020 Force; Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army active-duty personnel</td>
<td>560,000</td>
<td>Reduced 370,000  Sustained 390,000-400,000</td>
</tr>
<tr>
<td><strong>Forward ground forces</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top echelons</td>
<td>2 armies, 8 corps</td>
<td>1 command, 6 corps</td>
</tr>
<tr>
<td>Active divisions</td>
<td>5 mechanized, 17 infantry</td>
<td>3 mechanized, 10 motorized 5 mechanized, 8 motorized</td>
</tr>
<tr>
<td>Reserve divisions</td>
<td>6 HRDs, 9 MRDs</td>
<td>5 HRDs [+4 MRDs]</td>
</tr>
<tr>
<td>Heavy brigades</td>
<td>4 armor</td>
<td>3 armor, 1 mechanized</td>
</tr>
<tr>
<td>Light brigades</td>
<td>3 infantry</td>
<td>4 security</td>
</tr>
<tr>
<td><strong>Rear ground forces</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divisions</td>
<td>7 HRDs, 3 MRDs</td>
<td>6 HRDs</td>
</tr>
<tr>
<td>Brigades</td>
<td>3 commandos</td>
<td>1 commando</td>
</tr>
<tr>
<td>Reserve personnel</td>
<td>3,000,000</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Tanks</td>
<td>2,300</td>
<td>1,700  2,300</td>
</tr>
<tr>
<td>Armor vehicles</td>
<td>2,400</td>
<td>1,900  2,400</td>
</tr>
<tr>
<td>Artillery/multiple rocket launchers</td>
<td>5,300  3,700  5,300</td>
<td></td>
</tr>
<tr>
<td>Missiles</td>
<td>30</td>
<td>~50?</td>
</tr>
<tr>
<td>Helicopters</td>
<td>600</td>
<td>400?  600?</td>
</tr>
</tbody>
</table>


### Figure VI.5. Defense Reform 2020 (2005) Plans for ROK Modernization – Part Two

#### Comparison of the ROK Navy and Marine Corps, 2004 versus 2020

<table>
<thead>
<tr>
<th>Force Type</th>
<th>2004</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navy/Marine Corps personnel</td>
<td>67,000</td>
<td>64,000</td>
</tr>
<tr>
<td><strong>Surface Combatants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destroyers</td>
<td>3 KDX I, 2 KDX II</td>
<td>3 KDX I, 6 KDX II, 6 KDX III</td>
</tr>
<tr>
<td>Frigates</td>
<td>9 Ulsan</td>
<td>17 FFX</td>
</tr>
<tr>
<td>Corvette</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Patrol</td>
<td>82</td>
<td>40 PKM-X</td>
</tr>
<tr>
<td><strong>Submarines</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KSS-3</td>
<td>0</td>
<td>9?</td>
</tr>
<tr>
<td>KSS-2 (Type 214)</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Type 209</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Mini-sub (KSS-1)</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td><strong>Mine warfare</strong></td>
<td>17</td>
<td>10?</td>
</tr>
<tr>
<td><strong>Amphibious ships</strong></td>
<td>4 LSTH, 4 LST</td>
<td>5 LPD, 7? LSTH</td>
</tr>
<tr>
<td><strong>Major support ships</strong></td>
<td>6</td>
<td>8?</td>
</tr>
<tr>
<td>Aircraft</td>
<td>8 P-3C, 8 S-2A, 5 Caravan</td>
<td>16 P-3C, 5 Caravan</td>
</tr>
<tr>
<td>Navy helicopters</td>
<td>30 Lynx</td>
<td>30 Lynx, 8 Mine Hunter, 60 KHP?</td>
</tr>
<tr>
<td>Marine divisions</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Marine brigades/regiments</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Tanks</td>
<td>60 K-1</td>
<td>60 K-1A1</td>
</tr>
<tr>
<td>Other armor</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Artillery</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Helicopters</td>
<td>6 SA-316</td>
<td>60 KHP?</td>
</tr>
</tbody>
</table>


**Figure VI.5. Defense Reform 2020 (2005) Plans for ROK Modernization – Part Three**

**Comparison of the ROK Air Force, 2004 versus 2020**

<table>
<thead>
<tr>
<th>Force Type</th>
<th>2004</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Force personnel</td>
<td>64,000</td>
<td>65,000</td>
</tr>
<tr>
<td>Fighter aircraft</td>
<td>0 high end</td>
<td>60 KF-15, 60 KF-X</td>
</tr>
<tr>
<td></td>
<td>150 F-16</td>
<td>170 KF-16</td>
</tr>
<tr>
<td></td>
<td>380 F-4, F-5, A-37</td>
<td>130 A-50?</td>
</tr>
<tr>
<td>Forward air control</td>
<td>30 O-1, O-2</td>
<td>20 KO-1</td>
</tr>
<tr>
<td>Reconnaissance</td>
<td>27 RF-4C, RF-5, Hawker</td>
<td>24 RKF-16, Hawker</td>
</tr>
<tr>
<td>Search and rescue</td>
<td>6 CH-47, 3 AS-232</td>
<td>7 Ka-32</td>
</tr>
<tr>
<td>Airborne early warning and control (AWACS)</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Tankers</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Training aircraft</td>
<td>18 Hawk, 30 T-38, 15 T-41, 54 F-5, 25 T-33, 55 KT-1</td>
<td>90 KT-50, 80 KT-1</td>
</tr>
<tr>
<td>Transport helicopters</td>
<td>3 UH-60</td>
<td>?</td>
</tr>
<tr>
<td>UAVs</td>
<td>3 Searcher, 100 Harpy</td>
<td>More numerous, diverse</td>
</tr>
<tr>
<td>Air defenses</td>
<td>200 Nike, 110 I-Hawk</td>
<td>SAM-X, M-SAM</td>
</tr>
</tbody>
</table>


These plans were amended in June 2009 with the “Defense Reform Basic Plan (2009-2020),” further refining the modernization and civilian base expansion goals while reducing the previously planned force strength reduction (from a projected 500,000 to 517,000) and introducing the possibility of preemptive strikes against DPRK missile and nuclear facilities.

USFK described this evolution as follows in 2010:

Three phases have been established that will allow for a quicker force that can operate more precisely in an ever-changing global environment. This includes a force that relies less on manpower and more on technology. This change in focus results in a shift from the fixed and slow moving force focused on threat-based situations to a rapidly deployable, capability-based force.

The current Defense Reform Plan 2020 includes downsizing of the military force, reducing the active components to 500,000 personnel and the reserve components to 1.5 million. These represent reductions in forces by 27 percent and 52 percent respectively. The expenses saved in personnel will be dedicated to develop a more technologically sophisticated force. By having already enhanced its ability to manufacture and produce weapons and equipment resulting from fulfilling the 1974 through 1981 Force Improvement Plan, the Korean government is able to use much of its military investments to enhance its industrial base and further establish a more self-reliant defense system.

At the end of 2009, South Korea began its plan to decrease the number of military installations. The plan entails a reduction from the current 1,900 to 700 by the year 2020 when the restructuring of the military was to be completed in accordance with the defense reform. The projected relocation plan is shown in Figure VI.6.
Revised Plans, More Modernization and Key Force Upgrades: 2010-2014

Tensions with the DPRK did not ease as expected, and ROK faced many other challenges during years that followed, including reductions in manned US units on its territory, and a greater desire for autonomy within the US-ROK alliance. Combined with its assumption that it would face a continued hostile threat environment, these trends pushed the ROK to increase its capabilities in areas previously overseen by US forces, notably in surveillance, reconnaissance, and early warning. This led to substantial changes in the previous plans.

The following measures were given priority to deal with the increasing DPRK threat: 18

- Organize frontline troops in a manner that allows them to exercise their combat strength immediately after the outbreak of war to secure the security of the metropolitan region;
- Boost surveillance/reconnaissance, precision strike, and interception capabilities in order to block and eliminate North Korea’s asymmetric threats in enemy areas to the utmost extent;
- Secure strong reserve mobile power for each unit in order to counter enemies with a numerical advantage; and
- Secure combat sustainability by stabilizing noncombat zones and nurturing elite reserve forces.

In late 2009, President Lee commissioned 15 experts to reexamine and redesign the ROK Defense Reform Plan due to a perception that the DPRK threat had not eased as previously expected and the changing geostrategic environment. One year later, the Presidential Committee for Defense Reform submitted proposals for modifying 71 of the Defense Reform Plan projects.

Based on these proposals, the Ministry of National Defense (MND) released an updated version, focusing on military structure and the defense management system, to be implemented in short-, mid-, and long-term projects. This plan was entitled Defense Reform Plan 307, and took into account the ROK’s experience with more recent provocation by the recent DPRK like Cheonan and Yeonpyeong. President Lee approved it in March 2011, and the proposal became the Defense Reform Basic Plan (2012-2030) after going through the legislative process.19

In a report describing the changes envisioned by the plan, the MND called for both reinforcement of its troops and reforms in its chain-of-command. Three priority areas were identified: increasing the integrity of the ROK armed forces through military restructuring, ensuring active deterrence capabilities, and maximizing the efficiency of the national defense administration and force structure. Early warning and surveillance capabilities, including increasing the number of UAVs, were also emphasized. In addition, eight priority issues were identified:20

1. Reorganization of the armed forces’ chain-of-command
2. Establishment of an island defense command for the northwest (Yellow Sea)
3. Improvement of the national defense training structure
4. Organization of a priority order for strengthening military power
5. Response to North Korea’s special forces and cyber threats
6. Enhancement of mental strength and assistance for educating national citizens about security
7. Improvement of the national defense personnel management system
8. Bettering the efficiency of the national budget

ROK military strategy had previously “placed greater emphasis on deterring North Korea’s intention to provoke by mainly acquiring defensive capabilities,” This was also termed “defense by denial” – whenever the DPRK made a provocation, the ROK would try to contain the action and prevent further escalation, maintaining peace on the Korean Peninsula.21

The updated 2012-2030 Plan, issued in 2012, focused on enabling the South Korean military to retaliate immediately, proportionally, and in a focused way against the DPRK that would take account of enhanced ROK offensive capabilities – and make the DPRK cease its provocations. The ROK Minister of National Defense at the time stated, “[i]f the enemy attacks our people and territory, I will use force to punish the enemy to make sure it doesn’t even dare to think about it again. The enemy should be punished thoroughly until the source of hostility is eliminated.”22

According to the ROK Deputy Minister for Defense Reform at the MND, the updated Plan “clearly reflects the guideline that a proactive deterrence, rather than a simple deterrence, is needed even during times of relative peace in order to deter North Korean provocations.” The ROK’s goal was to create deterrence based credible intimidation to dissuade the adversary from even planning provocations. In particular, special combat units in the Army, Navy, and Air Force would be newly activated or reorganized in response to the asymmetric threats.
The ROK had also relied on three mutually reinforcing strategic pillars: forward active defense, defensive deterrence, and alliance with the US. Now, it would reorganize its forces to provide a capability to increase proactive deterrence.\(^{23}\)

In the case of the Army, the mountain brigade will be set up in response to the potential infiltration of the North Korean Special Operational Forces (SOF), which are currently estimated to number around 200,000 men. The Mountain brigade will be supplied with lightweight equipment and will operate in the mountainous region of the eastern front.

As for the Navy, the Submarine Command will be established as a part of the submarine modernization plan, by expanding the existing submarine group. Moreover, a next generation Korean destroyer, KDDX will be constructed and deployed after 2020. The size of this new destroyer will be between that of the currently operating 4,200-ton KDX-II and the Aegis Destroyer KDX-III, and will be assigned to a naval task force.

The Marine Corps will activate the Jeju Unit and become responsible for the integrated civil-governmental-military defense operations in the vicinity of Jeju Island in lieu of the Jeju Defense Command currently under the command of the Navy. Moreover, in order to reinforce the defense of the northwestern frontline islands and to strengthen the Marines’ amphibious capabilities, the Marine Aviation Group equipped with amphibious maneuverability and attack helicopters will also be activated.

The priority of the Air Force is to first establish the Air Intelligence Group by the year 2017, which will be responsible for aerial reconnaissance and intelligence support. The Air Intelligence Group will operate reconnaissance aircraft, mid- to high-altitude unmanned aerial vehicles (UAVs), as well as intelligence acquisition equipment for imagery intelligence (IMINT) and electronic signals intelligence (ELINT). Furthermore, the Satellite Surveillance Control Squadron responsible for the surveillance of military and civilian satellites passing over the Korean peninsula is also planned to be established by the year 2019. The satellite reconnaissance and surveillance capabilities will not only provide greater air and space operations capabilities but will also help the ROK military to detect any potential threats against the ROK in advance, to prevent any contingencies and to increase the effect of their response.

Finally, the ROK military is reorganizing its force structure in preparation against North Korea’s SOF and cyberpace threats. The Ministry plans to reinforce rear area operation units and strengthen our homeland defense divisions. In order to improve their execution capabilities, the ROK military decides to upgrade rear area C2 & strike system. Furthermore, the ROK military is increasing the number of personnel allocated to the Cyber Command in response to asymmetric threats.

Cyber-warfare staffing was planned to increase by 1,000 in order to better prepare for the rising cyber-security threat.\(^{24}\) The ROK also planned to improving the capabilities of its force structure capabilities to better respond to the DPRK’s missile threats, while reorganizing its command and personnel structures\(^{25}\).

In addition to the reorganization plan for field units, plans for the development and allocation of weapons systems have been developed in order to effectively respond to enemy attacks. The plans include development of ballistic missile capabilities, procurement of ballistic missile detection radars in response to North Korea’s ballistic missile threats, and development and deployment of mid-range surface-to-air missiles (M-SAMs) and long-range surface-to-air missiles (L-SAMs). Hereby, the capacity and competencies of the Missile Command will be significantly improved.

North Korea holds a higher strategic ground against South Korea in terms of missile and long-range artillery capabilities since it is currently assessed to be in possession of, and to have fielded mid-range Nodong (range: 1,300 km) and Musudan (range: 2,500 to 4,000 km) missiles, and to be developing a long-range missile, the Taepodong 2 (range: 6,000 km). Moreover, while there are some practical constraints on South Korea’s ability to exercise its proactive deterrence strategy in reality, North Korea can strike any place, anywhere in South Korea as it targets. Hence, the extension of South Korea’s missile range is imperative. Furthermore, acquiring deterrent capabilities to directly strike North Korean core facilities such as nuclear facilities and missile operating bases even during the armistice is of vital importance.

The ROK military intends to restructure its operational command structure. Under a new streamlined structure, the ROK military will unify its operational command and support by allowing the three Service
Headquarters to directly participate in the operational chain of the ROK Chairman of the JCS. The purpose of restructuring operational command system lies in reducing inefficiency and ensuring more effective operational execution in any given theater. The Armed Forces Organization bill to realize such an idea was introduced to the National Assembly on September 24, 2012.

Under the proposed bill, the currently top-heavy command structure will be streamlined by integrating the Headquarters and Operations Command of individual Services. And, in turn, more personnel will be able to be assigned to the tactical units where they are most needed so that the ROK military can be transformed into a stronger warfighting force. A reduction in the overall number of flag officers is also planned. Such a reduction, however, is not intended to be a unilateral reduction. Rather, those areas more pertinent to actual combat operations will see an increase in the number of flag officers.

In anticipation of the effects of the low birth rate on the nation’s population growth as well as reduced budget and the changing battlefield environment, the personnel structure reform characterized by down-sized troops and increased number of non-commissioned officers (NCOs) will be implemented.

The overall manpower will be reduced from the current level of 636,000 to 522,000 service members by the year 2022. While the number of seamen, airmen, and marines will be maintained at the current level of 41,000, 65,000 and 28,000 respectively, that of the soldiers of the Army will be reduced in numbers from approximately 500,000 to 387,000. Moreover, the number of corps and divisions will also be reduced from eight to six and 42 to 28, respectively.

In order to guarantee that the reduction in the number of service members does not lead to any reduction of actual strength of the forces, the MND will acquire high-tech weaponry and equipment and progressively promote the officers and NCOs, mainly through expansion of the NCO’s recruitment volume. Accordingly, the average proportion of officers and NCOs in individual Services is expected to be increased from the current level of 29.4 percent to 42.5 percent by the year 2025. In addition, the completion of the increase in the number of female service members, which was previously planned for the year 2020, will be completed by the year 2017. Consequently, the average percentage of female officers and NCOs will increase up to 7 percent and 5 percent, respectively. Also, additional Military Occupational Specialties (MOS) such as artillery, armor and air defense will be opened to female service members.

Meanwhile, in light of the changes in the military structure followed by the deactivation of the First and Third ROK Armies scheduled in 2015, a new operations execution system focusing on corps level units will be established. As for the battalion level, a special emphasis will be placed on strengthening the combat execution capabilities of infantry battalions responsible for frontline operations. Mid-range anti-tank guided weapons, dual-caliber air-burst assault rifles, and small UAVs will be provided to battalion level units. The number of officers and NCOs at the battalion level will also be increased from the current level of 90 to 152.

In order to carry out these reforms, the Deputy Minister estimated that the 2012-2016 defense budget would require 187.9 trillion won along with a continuing annual budget increase of 6-8%. The total cost would be 59.3 trillion won for force improvement programs with an annual estimated increase rate of 8.8%, and 128.6 trillion won for operations and maintenance. The ROK also released a Mid-Term Defense Plan for 2013-17, that focused on measures designed to counter the DPRK’s growing nuclear, ballistic missile, cyber, and long-range artillery capabilities.26

The top priority lies in deploying the Hyunmu 2A SSM and the Hyunmu-3C cruise missiles after configuration tests are completed between 2012 and 2014. The ministry also stressed the need to deploy mid- and long-range surface-to-air missiles against North Korea’s growing ballistic-missile inventory; the so-called L-SAM program (a Korean Patriot variant) is due to begin development in 2013, with an initial cost of some US$87m. In total, the ministry plans to spend some US$5.3bn up to 2016 in meeting current military threats from the North. Critics have said, however, that by focusing on countering near-term North Korean threats, South Korea has under-emphasized some emerging risks.

The mid-term defence plan also called for the general-purpose forces to be reduced from 636,000 to 520,000 by 2022, leaving 387,000 in the ground forces; 65,000 in the air force; 40,000 in the navy; and 28,000 Marines. By 2020, the army will reduce to eight corps and 37 divisions, and fall further to six corps and 28 divisions by 2030. Meanwhile, a Mountain Brigade will be created by 2020, together with extra ATGW units
and short-range UAVs. The navy has announced a range of capability developments intended to better meet North Korean and regional contingencies and has said it will establish new marine, ground-defence and attack-helicopter units.

A South Korean analysis of these trends made by Paek Jaeok of the Korea Institute for Defense Analyses in 2012 noted that:27

In 2012, investment priorities [see Figures VI.7 and VI.8] associated with defense capability improvement expenditure are “securing core combat capability against the possibility of provocations form the North, the transfer of wartime operational control to the ROK in 2014, and bolstering defense R&D….” (See Figure VI.9)

In 2012, new procurement programs include Geomdoksuri-B (PKX-B) special warfare support ships/special infiltration boats; next-generation figure planes (F-X); large-sided attack helicopters (AH-X); production of Korean-type maneuver helicopters in large quantities; offshore operation helicopters; surveillance unmanned aerial vehicles (UAVs); Cheolmae-II (mid-range surface-to-air missiles); multi-purpose precision guided cluster bombs; and GPS-guided bomb-2. New R&D programs involve wheeled combat vehicles; ground tactical data link (KVMF); and 2.75-inch guided rockets. New performance improvement programs include K1A1 tank, KJCCS, and Cheolmae-II performance improvement. These new programs are targeted as investment priorities for defense capability improvement in 2012….

Securing core combat capability [see Figure VI.10 against the possibility of provocation from the North and the transfer of wartime operational control to the ROK.

“Core combat capability against the possibility of provocation from the North” refers to the early detection of enemy’s surprise attacks, advanced surveillance and reconnaissance capability, and precision strike capability against the origin of attack.

As to readiness against the North’s local provocations, the ROK puts priority on enhancement of combat capability (e.g. anti-artillery radars, sound-based target detection equipment, K-9 self-propelled guns, small-sized mid-range GPS-guided bombs, etc.) in the northwestern islands close to the North, and the overall reinforcement of tactical units.

The Army will bolster its infantry battalions by equipping troops with advanced equipment such as single-eye night vision goggles, individual firearms with sighting telescopes, K-11 rifles, etc.

The Navy will focus on expanding and improving its coastal operations thought increased use of Geomdoksuri-A, special warfare support ships/special infiltration boats, offshore helicopters, detection radar placed on patrol boats/convoy ships.

The Air Force will prioritize enhancement of precision strike capability with the use of small-sized mid-range GPS-guided bombs, mid-range GPS-guided kits, JDAM, JASSM, etc. The military’s primary tactical response of coping with the threat of the North’s long-range artillery is by reinforcing its identification/detection capability (e.g. anti-artillery radar, sound-based detection equipment, division-level UAVs), command/control readiness, and counter-strike ability (K-9 self-propelled guns, multi rocket launchers, JDAM, etc.).

The transfer of wartime operational control to the ROK scheduled for 2015 necessitates the refinement of certain core command, tactical and logistic capabilities in order to adequately prepare for ROK-led all-theater-level operations, including the ability for surveillance, reconnaissance and early warning, operation of a command/control system for all theater operations, precision strike, and continued provision of support (particularly wartime ammunition). The C4I (Command Control, Communications, Computer and Intelligence) system currently stands in place for the operational linkage between the ROK military and the USFK.

Accordingly, the country will seek to reinforce surveillance, reconnaissance and early warning ability encompassing the entire Korean Peninsula with the expanded use of AWACs aircrafts, ballistic guided missiles, early warning and long-range radar, the ability to collect image-based information from neighboring countries, including the North (through multi-purpose utility satellites, mid- and HUAVs, corps-level UAVs), and the ability to collect three dimensional signal-based information.
For adequate provision of support, all-theater operational command/control requires a proper system allowing for timely command, control and decision which will be facilitated through performance improvement of the Allied Korea Joint Command and Control System (AKJCCS) and KJCCS, as well as a robust infrastructure communications system for real-time information dissemination [supported through the Military Satellite Communications System and the Joint Tactical Data Link System (JTDLS)].

The ability to strike core positions in the North with precision strike capability will be enhanced with the use of laser-guided bombs (GBU-24), GPS-guided bombs (JDAM), bombs for destroying underground facilities (GBU-28), long-range guided missiles (JASSM), and mid-range GPS-guided kits, along with the system for carrying such weapons (KDX-II/III, KSS-II, F-15K, F-X). Finally, the country aims to maintain at least 30 days worth of wartime ammunition, for continued provision of support.

In 2012, the defense R&D budget amounts at 2,321.0 billion won, up 12.8% over the preceding year. [See Figure VI.12] Investment priorities in defense R&D systems development are aimed at the following six areas: surveillance/reconnaissance, command/control, information/electronic warfare, precision strike, new/special guided weapon capability, and infrastructure combat capability. Investment priorities in core technology development are placed on the following eight areas: sensors, information/communication, control/electronic, chemical-biological-radioactive warfare, and materials.

In reviewing the investment priorities for the 2012 defense budget, the factors shown to exert the most crucial impact on defense budget operation and allocation are: maintaining a proper ratio of officers and NCOs; the timely securing of combat capability against the possibility of provocation from the North and in preparation for the transfer of wartime operational control to the ROK in 2015; and the efficient promotion of defense R&D. These are also tasks to be carried out under the Basic Defense Reform Plan.

…[T]he mid-term (2012-2016) investment for improvement of defense capability is focused on how to cope with the North’s local provocations and asymmetrical threats as well as the return of wartime operational control to the ROK in 2015; and the efficient promotion of defense R&D. These are also tasks to be carried out under the Basic Defense Reform Plan.

AN IISS discussion of the broad trends in ROK modernization spending in 2013 indicated that the ROK MND had judged that several areas of defense capability and policy needed special attention:

- Improve C4ISR capabilities
- Enhance the ‘jointness’ of the armed forces
- Plan for the 2015 OPCON transfer (discussed in Chapter 6)
- Continue to follow the Basic Defense Reform Plan 2012-30 (discussed earlier in this chapter)
  - Upgrade military command-and-control structures
  - Increase R&D spending by 7%
  - Build up information-security and cyber-warfare capacity
- Streamline procurement and undertake other reforms to save $400 million annually during the 2013-17 Mid-Term Defense Program
  - In addition, improved processes and standards, manpower and organization restructuring, outsourcing, and better financial efficiency should also help save money
- The 2012 military budget was split into 70% for force maintenance and 30% for force modernization; by 2017, modernization should increase to 33% of the budget

The ROK’s short-term procurement goal was to increase deterrence against the DPRK’s long-range artillery and ballistic missile capabilities. To do this, the ROK planned to develop medium- and longer-range SAMs, while also introducing a cruise missile (the Hyunmu-3C) and a surface-to-surface tactical ballistic missile (the Hyunmu-2A). The Navy worked to provide more integrated
Korean Peninsula Military Modernization

The ROK Air Force planned to increase surveillance systems significantly, especially after the OPCON transfer in 2015 (as discussed in Chapter II) – such as by developing electronic- and signals-intelligence systems, medium- and high-altitude UAVs, an airborne early warning unit in 2017 and a satellite surveillance control center in 2019. Air Force modernization became primarily oriented towards the FX-3 fighter replacement program – costing approximately $7.6 billion; with 40 aircraft to be delivered starting in 2016. The announced candidates were the Eurofighter Typhoon, Lockheed Martin’s F-35, and Boeing’s F-15SE. The ROK also wants to replace its F-4s and F-16s.

News reports indicated in early April 2013 that the US was selling 60 F-35s to the ROK for $10.8 billion, and 60 F-15s for $2.4 billion. Although actual delivery of the F-35s would not take place until many years in the future. Later reports in September 2014, indicated that the ROK would buy 40 F-35 fighters for 7.34 trillion won ($7.06 billion) for delivery in 2018-2021.

It was also reported on April 17, 2013 that the ROK Army, in order to modernize its aging helicopter fleet, had agreed to a $1.6 billion contract with Boeing for 36 AH-64E Apache Guardian attack helicopters to be delivered by 2018, accompanied by related logistical support and training. In early May 2013 the US Congress agreed to sell four Global Hawk spy UAVs to the ROK – eight years after they were requested – though it is uncertain if the ROK still wants the equipment.

As for the FX-3 program, the IISS noted, however, air-force modernization is dominated by the FX-3 fighter replacement program. This is the armed forces’ largest procurement program, with a budget of some US$7.6bn for a total of 40 combat aircraft, to be introduced from 2016. Seoul is seeking to replace its ageing F-16s as well as its older F-4s. Reportedly, the latter are virtually inoperable. The three contenders for the FX-3 are Boeing’s F-15SE, Lockheed Martin’s F-35, and the Eurofighter Typhoon. The Defense Acquisition Program Administration (DAPA) has insisted that war-fighting capabilities, cost and maintenance efficiency, associated technology transfers, and interoperability will be the key criteria in the final decision. The original plan was for DAPA and the ministry to decide the winner by the end of October 2012 – a deadline that was not met.

In September 2014, there were media reports that the DAPA agreed to a deal for 40 F-35A fighters worth WON 7.3 trillion. This deal would include technology transfer in 17 sectors for use in KF-X. They included flight control and fire suppression technologies, which were an important aspect of the KF-X design.

In March 2015, the Korean government chose Korean Aerospace Industries along with partner Lockheed Martin to to develop 120 KF-Xs. The KF-X may be operational by the mid-2020s and is planned to initially deploy with, and then replace the KF-16. The goal is to promote domestic development and production by advancing the ROK defense industry as well as give the ROK better control over its configuration and systems.

Some reports indicate the government estimated the project will cost approximately 6 trillion won ($5.5 billion), though KIDA argues it would be at least 10 trillion won to develop. Constructing 120 units would cost 8 trillion won, and 30-year operation costs would be $9 trillion. Experts for Jane’s believe that 220-676 planes could be exported if priced at approximately $70-90 million each, compared to Lockheed Martin’s F-16 ($70 million each) and the Boeng F/A-18E/F Super
Hornet, the Eurofighter Typhoon, and the Dassault Rafale ($83-132 million each). Countries in South East Asia, the Middle East, and Latin America have been proposed as potential customers. There remain significant hurdles to the actual development of the plane, especially technological readiness.\textsuperscript{39}

**Figure VI.7: Investment Priorities Related to Improvement of Defense Capabilities (KRW Billions or Percent)**

<table>
<thead>
<tr>
<th></th>
<th>2006-2011</th>
<th></th>
<th>2012-2016 Mid-term Defense Plan</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (Won)</td>
<td>Share (%)</td>
<td>Increase/Decrease\textsuperscript{40}</td>
<td>Amount (won)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>47,581</td>
<td>100</td>
<td>+ 10.9</td>
<td>60,752</td>
</tr>
<tr>
<td>Surveillance/Reconnaissance</td>
<td>2,044</td>
<td>4.3</td>
<td>- 57.7</td>
<td>2,094</td>
</tr>
<tr>
<td>Precision Strike and New/Special Guided Weapons</td>
<td>6,063</td>
<td>12.7</td>
<td>-26.6</td>
<td>5,153</td>
</tr>
<tr>
<td>Firepower/Ammunition</td>
<td>5,795</td>
<td>12.2</td>
<td>-20.1</td>
<td>8,486</td>
</tr>
<tr>
<td>Maneuverable Combat Capability</td>
<td>4,788</td>
<td>10.1</td>
<td>-15.6</td>
<td>5,974</td>
</tr>
<tr>
<td>Defense R&amp;D</td>
<td>9,190</td>
<td>19.3</td>
<td>-13.8</td>
<td>13,737</td>
</tr>
<tr>
<td>Ships</td>
<td>7,924</td>
<td>16.7</td>
<td>+ 9.8</td>
<td>9,251</td>
</tr>
<tr>
<td>Airplanes</td>
<td>9,129</td>
<td>19.2</td>
<td>+ 0.8</td>
<td>13,789</td>
</tr>
<tr>
<td>Command/Control/Communication</td>
<td>1,742</td>
<td>3.7</td>
<td>+ 16.2</td>
<td>1,289</td>
</tr>
</tbody>
</table>

**Figure VI.8: 2012 Defense Capability Improvement Expenditure (KRW Hundred Millions or Percent)**

<table>
<thead>
<tr>
<th>Description</th>
<th>2011 Budget</th>
<th>2012 Government Proposal</th>
<th>2012 Budget</th>
<th>Increase/Decrease (amount)</th>
<th>Line item percentage of increased/decreased amount</th>
<th>Number of relevant programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td>96,935</td>
<td>101,350</td>
<td>98,938</td>
<td>2,003</td>
<td>2.1</td>
<td>216</td>
</tr>
<tr>
<td><strong>Command, Control, and Communication</strong></td>
<td>625</td>
<td>384</td>
<td>369</td>
<td>-256</td>
<td>-41</td>
<td>5</td>
</tr>
<tr>
<td><strong>Maneuver Combat Capability</strong></td>
<td>9,719</td>
<td>10,990</td>
<td>10,772</td>
<td>+1,053</td>
<td>+10.8</td>
<td>21</td>
</tr>
<tr>
<td><strong>Ships</strong></td>
<td>17,336</td>
<td>17,941</td>
<td>16,665</td>
<td>-681</td>
<td>-3.9</td>
<td>17</td>
</tr>
<tr>
<td><strong>Airplanes</strong></td>
<td>14,749</td>
<td>15,951</td>
<td>15,951</td>
<td>+1,202</td>
<td>+8.2</td>
<td>13</td>
</tr>
<tr>
<td><strong>Firepower and Ammunition</strong></td>
<td>14,145</td>
<td>14,261</td>
<td>14,561</td>
<td>+416</td>
<td>+2.9</td>
<td>8</td>
</tr>
<tr>
<td><strong>Surveillance and Reconnaissance</strong></td>
<td>6,862</td>
<td>5,474</td>
<td>5,148</td>
<td>-1,714</td>
<td>-25.0</td>
<td>12</td>
</tr>
<tr>
<td><strong>Precision Strike/New Special Guided weapons</strong></td>
<td>8,872</td>
<td>7,453</td>
<td>7,031</td>
<td>-1,841</td>
<td>-20.7</td>
<td>23</td>
</tr>
<tr>
<td><strong>Defense R&amp;D</strong></td>
<td>17,216</td>
<td>18,248</td>
<td>18,279</td>
<td>+1,063</td>
<td>+6.2</td>
<td>64</td>
</tr>
<tr>
<td><strong>Performance Improvement</strong></td>
<td>6,289</td>
<td>9,410</td>
<td>8,928</td>
<td>+2,639</td>
<td>+41.9</td>
<td>30</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>1,122</td>
<td>1,238</td>
<td>1,244</td>
<td>+122</td>
<td>+10.8</td>
<td>23</td>
</tr>
</tbody>
</table>


**Figure VI.9: Trends in Defense R&D Expenditures, 2004-2012 (Percent)**

<table>
<thead>
<tr>
<th></th>
<th>Share of Technological Development in R&amp;D Expense</th>
<th>Share of Basic Research in Technological Development</th>
<th>Share of Core Technology in Technological Development</th>
<th>Share of Projects Led by Businesses-Universities-Research institutes in Core Technologies</th>
<th>Share of Projects Led by Private Businesses in Systems Development Expense</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2004</strong></td>
<td>22.0</td>
<td>0.9</td>
<td>28.1</td>
<td>--</td>
<td>28.8</td>
</tr>
<tr>
<td><strong>2009</strong></td>
<td>29.4</td>
<td>1.6</td>
<td>33.9</td>
<td>35.9</td>
<td>47.1</td>
</tr>
<tr>
<td><strong>2012</strong></td>
<td>27.9</td>
<td>1.9</td>
<td>39.0</td>
<td>40.5</td>
<td>56.9</td>
</tr>
</tbody>
</table>

### Figure VI.10: 2012 Defense Budget and Combat Capability Operation Expenditures (KRW hundred millions or Percent)

<table>
<thead>
<tr>
<th>Description</th>
<th>2011 Budget</th>
<th>2012 Government Proposal</th>
<th>2012 Budget</th>
<th>Increase/Decrease (amount)</th>
<th>Percentage increase/decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defense Budget</td>
<td>314,031</td>
<td>331,552</td>
<td>329,576</td>
<td>15,545</td>
<td>+ 5.0</td>
</tr>
<tr>
<td>* Combat Capability Operation</td>
<td>217,096</td>
<td>230,202</td>
<td>230,638</td>
<td>13,542</td>
<td>+ 6.2</td>
</tr>
<tr>
<td>-- Troop Operation</td>
<td>128,185</td>
<td>134,674</td>
<td>134,923</td>
<td>6,738</td>
<td>+ 5.3</td>
</tr>
<tr>
<td>- Personnel expense (including legal reserve)</td>
<td>111,725</td>
<td>117,579</td>
<td>117,579</td>
<td>5,854</td>
<td>+ 5.2</td>
</tr>
<tr>
<td>- Food</td>
<td>13,237</td>
<td>13,486</td>
<td>13,735</td>
<td>498</td>
<td>+ 3.8</td>
</tr>
<tr>
<td>- Clothing</td>
<td>3,223</td>
<td>3,609</td>
<td>3,609</td>
<td>386</td>
<td>+ 12.0</td>
</tr>
<tr>
<td>-- Maintaining Combat Capability</td>
<td>88,911</td>
<td>95,528</td>
<td>95,715</td>
<td>6,804</td>
<td>+ 7.7</td>
</tr>
<tr>
<td>- Defense-related Informatization</td>
<td>4,726</td>
<td>5,008</td>
<td>5,006</td>
<td>280</td>
<td>+ 5.9</td>
</tr>
<tr>
<td>- Enhancement of Servicemen’s Health and Welfare</td>
<td>2,159</td>
<td>2,450</td>
<td>2,478</td>
<td>319</td>
<td>+ 14.8</td>
</tr>
<tr>
<td>- Logistics Support and Collaboration&lt;sup&gt;42&lt;/sup&gt;</td>
<td>37,329</td>
<td>38,704</td>
<td>38,752</td>
<td>1,423</td>
<td>+ 3.8</td>
</tr>
<tr>
<td>- Personnel Affairs, Education/Training</td>
<td>4,491</td>
<td>5,068</td>
<td>5,062</td>
<td>571</td>
<td>+ 12.7</td>
</tr>
<tr>
<td>- Facility Construction and Operation</td>
<td>23,547</td>
<td>25,626</td>
<td>25,646</td>
<td>2,099</td>
<td>+ 8.9</td>
</tr>
<tr>
<td>- Reserve Combat Capability Management</td>
<td>1,355</td>
<td>1,360</td>
<td>1,457</td>
<td>102</td>
<td>+ 7.5</td>
</tr>
<tr>
<td>- Operation of Military Institutions</td>
<td>779</td>
<td>845</td>
<td>869</td>
<td>90</td>
<td>+ 11.6</td>
</tr>
<tr>
<td>- Policy Planning and International Collaboration&lt;sup&gt;43&lt;/sup&gt;</td>
<td>8,088</td>
<td>8,186</td>
<td>8,186</td>
<td>98</td>
<td>+ 1.2</td>
</tr>
<tr>
<td>- Defense Administrative Support&lt;sup&gt;44&lt;/sup&gt;</td>
<td>6,437</td>
<td>8,281</td>
<td>8,259</td>
<td>1,822</td>
<td>+ 28.3</td>
</tr>
<tr>
<td>*Defense Capability Improvement</td>
<td>96,935</td>
<td>101,350</td>
<td>98,938</td>
<td>2,003</td>
<td>+ 2.1</td>
</tr>
</tbody>
</table>


The 2014 ROK Defense White Paper provided a new summary of the major achievements of the defense reform to date that is shown in Figure VI.11. It also described the progress of the various reforms as follows:\(^45\)

In December 2005, the MND established the Defense Reform Basic Plan (2006-2020) to transform the "manpower-oriented quantitative military structure" into an "information- and knowledge-oriented qualitative military structure."

Since then, the MND has modified and amended the basic plan in two- to three-year cycles in accordance with the analysis and assessment results on the domestic and foreign security situations and the progress of defense reform based on the National Defense Reform Act.

In June 2009, the MND established the Defense Reform Basic Plan (2009-2020), which reflects the response system against military threats including North Korea’s long-range missile launches and its second nuclear test, and other potential non-military threats.

In August 2012, the Defense Reform Basic Plan (2012-2030) was established to additionally reflect the changes in the domestic and foreign security environment and various military threats from North Korea such as the attack against the ROK Ship Cheonan and shelling of Yeonpyeong Island. In this plan, the target year for defense reform was modified from 2020 to 2030, considering the development of defense science technology and changes in the defense environment, such as existing and future threats.

After 2013, the necessity to prepare a deterrent force to respond against North Korea’s provocation threats and asymmetric force buildup was raised. Also, the need to transform into a structure which not only allows a timely and proactive response under the changing warfighting paradigm but also reduces the response time in detecting, deciding, and striking through network development was brought up. Also, defense reform needed to be modified since a low birthrate and rapid aging of society limit the sustainment of the quantitative military structure, and the increase in public welfare requirements hinder the stable securing of the defense budget.

Against this backdrop, in March 2014, the Defense Reform Basic Plan (2014-2030) was established, reflecting the security situation changes while maintaining the basic principles of the Defense Reform Basic Plan (2012-2030) to secure the motivational drive for defense reform. The military structure will transform into an elite force structure which has the proper capability to simultaneously respond against North Korean asymmetric threats, local provocations and aggression threats, and with a larger number of officers and NCOs to prepare for the reduction of military resources. In the defense management area, an advanced defense management system with high efficiency will be established by improving combat power through realistic education and training and effective personnel management, and through innovative logistics management by improving the mobilization system, shaping elite reserve forces, and improving the logistics system.

Jane’s Sentinel Security Assessment summarized the revised 2015 Mid-Term Defense Plan as follows in January 2016:\(^46\)

In April 2015 The MND announced the new Mid-Term Defence Plan (MTDP) covering 2016-20 with defence spending projected to increase by an average of 7.2% a year with total funding of KRW232.5 trillion (USD200 billion) allocated for the period. While the parameters outlined in the plan certainly represent a positive outlook to defend the projected funding levels are unlikely to be achieved in practice with government officials suggesting only six months later that the defence budget would increase by just 4% in 2016. Upon approval in December the 2016 budget was increased by 3.6% to KRW38.8 trillion (USD33.5 billion) including a 5.7% increase for modernization activities.

Actual growth between 2016 and 2020 is therefore likely to be significantly lower than the rates outlined in the MTDU with IHS Jane's Defence Budgets projecting average annual growth of 4.9% over the five year period. This rate of growth would see total spending over the period of KRW217.5 trillion with the annual defence budget increasing to around KRW44.2 trillion in real terms by 2020. Assuming expenditure on Force Improvement can be maintained at its current level of around 31% of the total defence budget, Korea could be expected to invest around 67.4 trillion on the modernization of its armed forces between 2016 and 2020.
Figure VI.11: ROK 2014 Force Improvement Plan – Part One

The MND will pursue a total of 290 force improvement projects from 2013 to 2017. It continues its 196 existing projects, including the K-21 IFV, and second batch of F-15Ks, and about 94 new projects, including the next generation destroyer and tanker aircraft programs.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Continuing Projects</th>
<th>New Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance, Reconnaissance, Command and Control Capabilities</td>
<td>• Airborne Warning and Control System&lt;br&gt;• Ground Tactical C4I System</td>
<td>• Harbor Surveillance System&lt;br&gt;• Mobile Underwater Surveillance Sonar</td>
</tr>
<tr>
<td>Maneuver and Fire Capabilities</td>
<td>• K21 Infantry Fighting Vehicles&lt;br&gt;• K-9 Self-propelled artillery</td>
<td>• Korean Utility Helicopter&lt;br&gt;• Improving the performance of K-55 Self-propelled artillery</td>
</tr>
<tr>
<td>Marine and Landing Capabilities</td>
<td>• Kwanggaeto the Great III class destroyer [Aegis]&lt;br&gt;• Jangbogo II class submarine</td>
<td>• The 2nd Minesweeper Project&lt;br&gt;• Next-generation mine laying ship</td>
</tr>
<tr>
<td>Air Combat Capabilities</td>
<td>• F-15K Fighter&lt;br&gt;• Advanced Trainer (T-50)</td>
<td>• Improving the performance of the C-130H</td>
</tr>
<tr>
<td>Research and Development</td>
<td>Intermediate-altitude unmanned UAVs, division-level UAVs</td>
<td></td>
</tr>
</tbody>
</table>


Figure VI.11: ROK 2014 Force Improvement Plan – Part Two


<table>
<thead>
<tr>
<th>Areas</th>
<th>Major Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military Structure Reform</td>
<td>• Reform of the Joint Chiefs of Staff and the headquarters of the Army, Navy and Air Force, reinforcement of their functions and organizations, and consolidation of similar functions and organizations</td>
</tr>
<tr>
<td></td>
<td>• Development of the military strategy basic concept (active deterrence → proactive deterrence)</td>
</tr>
<tr>
<td></td>
<td>• Adjustment of force buildup priority (preparing against local provocation threats as a top priority → preparing against local provocation and aggression threats simultaneously)</td>
</tr>
<tr>
<td></td>
<td>• Reinforcement of response forces against asymmetric threats and local provocations from North Korea</td>
</tr>
<tr>
<td></td>
<td>• Standing troops reduced by 51,000, and the ratio of officers and NCOs increased by 5.1% (2006-2014)</td>
</tr>
<tr>
<td>Defense Management Reform</td>
<td>• Establishment of training sites for realistic training conditions, such as the 5th Corps regionalized training site and 2nd Fleet comprehensive maritime training site</td>
</tr>
<tr>
<td></td>
<td>• Expansion of university-military agreements, including military science courses (six schools), NCO courses (four schools), and RNTC (Reserve NCO’s Training Corps) (six schools)</td>
</tr>
<tr>
<td></td>
<td>• Expansion of female personnel by increasing branches opened to female service members, and recruiting female cadets in the Korea Army Academy at Yeong-Cheon</td>
</tr>
<tr>
<td></td>
<td>• Installation of mobilization support groups (3) in the Marine Corps and the 51st and 52nd Homeland Divisions and mobilization supplement battalions (32)</td>
</tr>
<tr>
<td></td>
<td>• Pilot operation of enhanced military logistics system and establishment of defense logistics field automation system</td>
</tr>
<tr>
<td></td>
<td>• Operating 18 organizations, such as the Joint Interoperability Technology Center, as military executive agencies</td>
</tr>
<tr>
<td></td>
<td>• Replacement of military vehicles with commercial vehicles</td>
</tr>
<tr>
<td></td>
<td>• Establishment of the Integrated Civilian-Government-Military Committee to improve the military medical system</td>
</tr>
<tr>
<td></td>
<td>• Adjustment of functions and organizations between the Ministry of National Defense and Defense Acquisition Program Administration through the amendment of the Defense Acquisition Program Act</td>
</tr>
<tr>
<td></td>
<td>• Establishment of a preventive system with a focus on respect for lives</td>
</tr>
<tr>
<td></td>
<td>• Fostering disease prevention-oriented barracks environment, such as soldier health promotion projects</td>
</tr>
</tbody>
</table>

Modernization and Military Effectiveness in 2016

Figure VI.12 Summarizes the key developments these plans and efforts accomplished in terms of actual force modernization during 2000-2016.

The IISS analyzed the impact of modernization on the ROK’s forces as follows in 2016: 47

South Korea’s army consists of 11 corps, with 52 divisions and 20 brigades. They can deploy some 2,300 main battle tanks, 2,500 armored personnel carriers and light tanks, 4,500 heavy-caliber artillery pieces, 6,000 mortars, an estimated 600 air defence guns, over 1,000 surface-to-air missiles, and about a dozen short-range surface-to-surface missiles. Usually, 12 army divisions are deployed along the DMZ in heavily fortified positions.

The South Korean air force has 538 combat aircraft and 117 attack helicopters. Meanwhile, the South Korean navy includes 39 principal surface combatants, 20 submarines, 84 patrol and coastal combatants, 15 mine warfare ships, 12 amphibious vessels, and 60 naval combat aircraft. South Korea’s defence expenditure is several times more than that of North Korea. In 2002, as at average annual exchange rates, South Korea’s defence budget amounted to $13.2bn. However, this figure needs to be balanced as manpower costs in the South are greater.

… South Korea’s ground combat weapon capabilities are rated higher than those of North Korea because of South Korea’s qualitative edge. By the same measure, its air capabilities, when factoring in attack helicopters, are also superior – totaling about 2.5 F-16 wing equivalents. With the acquisition of the US Army Tactical Missile System (ATACMS) Block 1-A, due in service this year, South Korea’s armed forces will increase their capabilities significantly. The missile system has a range of 300km and can target command and communications facilities, intelligence assets, and missile launching sites.

Although the ROK military is still less than half the size of the DPRK’s in terms of force structure, personnel, and major equipment holdings; the ROK’s equipment is significantly more technologically advanced. The two countries have quantitatively comparable naval and air forces, though the ROK’s are much superior. The ROK’s primary shortcomings are in precision munitions, biological and chemical defense, communications and control, and command. Due to a constrained budget, the ROK has also had to cut or delay several modernization programs.

Reporting by Jane’s in 2016 further highlighted the ROK’s modernization efforts. The ROK Army planned the following procurement efforts: 48

**Main Battle Tanks (MBTs)**

- **K2 (Black Panther MBT)**- In November 2013 Hyundai-Rotem noted that production was underway for delivery of K2s to South Korea. IHS Jane’s reports that the initial delivery is expected to 100 units with potential to reach 600 going forward. The K2 is seen as a substantial improvement over South Korea’s current MBT, K1A1.

**Infantry Fighting Vehicles**

- **K21 IFV**- The K21s finishing production and set to enter service after solving problems in regards to buoyancy. K21s are the ROK’s first IFV that has been indigenously produced.

**Artillery**

- **K9 Thunder**- After the Yeonpyeong Island attacks (see Chapter 4), the ROK MND was considering additional procurement – seeking an extra $228 million (264 billion won) in the 2011 defence budget – of Samsung Techwin 155 mm/52 cal K9 Thunder self-propelled howitzers. The budget had already contained almost twice that amount (485 billion won) for K9 purchases.
The K9 is the primary ROK platform to offset the DPRK’s numerical advantage in artillery. The ROK requires more than 500 systems and at least 300 had been purchased by 2010. The plan is to acquire a total of 1,000 K9 systems.

**EVO-105 truck-mounted howitzer**

- The ROKA plans to field 800 **EVO-105 truck-mounted howitzers** by the year 2017. The EVO-105 offers an uptick in maximum rate of fire as compared to other towed versions of 105mm guns.

**M270 Multiple Launch Rocket System (MLRS) [Artillery]**

- Hanwha was granted a license in 2003 to domestically produce the Lockheed Martin 227 mm M270 MLRS rocket. Since 2005, approximately 4,000 missiles annually have been produced, worth around 600 billion won each year. The MLRS can also fire 300 km-range army tactical missile systems (ATACMS) that the ROK buys from the US. MLRS systems are assisting the ROK in OPCON transfer (discussed in Chapter 5), allowing the ROK to hit ground targets behind the DMZ.
- In April 2011, it was announced that a new multiple rocket launcher (MRL) was under development, with the initial prototype likely to be completed by 2013. It was projected to have an 80 km range and increase the ROK’s artillery capability.

**Long-range Multiple Rocket System**

- Deployment of the Hanwha made Chun-Mu long-range multiple rocket system (LRMRS) was announced August 4, 2015 by the South Korean Defence Agency for Technology and Quality (DTAQ).

**Air Defense**

- Roughly 2,000 Chiron man-portable air defense systems have been deployed in the ROKA since 2005. They are planned to replace old MANPADs like Mistrals.

**Anti-Tank [Infantry]**

- The ROK’s LIGNex1 Co Ltd was contracted to indigenously develop a Medium Range Infantry Missile (MRIM), as reported in May 2011. Development is projected to be finished by 2013, with production by 2014 and the first units in service in 2015.
- The MRIM will be deployed with a firing post and a vehicle-mounted launcher, though it is designed to be shoulder-fired. It is being developed to be comparable with Rafael’s Spike and Raytheon’s Javelin.

**C4ISR**

- South Korea appears to have acquired ground penetrating radar (GPR) system that they will attempt to attach on an unmanned mine detection vehicle.
- South Korea has previously bought four **Boeing 737 AEW&C** and there is plans to buy two more.

**Korean Attack Helicopter [Army Aviation]**

- “In June 2015, Korea Aerospace Industries (KAI) signed contracts to develop light helicopters for military and civilian applications, the company said in a statement. The deals feature the development of a Light Armed Helicopter (LAH) and a Light Civil Helicopter (LCH) and were signed with the Defense Acquisition Program Administration (DAPA) and Ministry of Trade, Industry and Energy (MOTIE) respectively.

  KAI said the combined value of the two development programs is KRW1.6 trillion (USD1.4 billion) and that this figure consists of funding from the two government agencies as well as "the investment of the industrial participants". According to KAI, DAPA will invest KRW650 billion and MOTIE KRW350 billion. KAI will invest KRW200 billion, with the remainder invested by KAI’s program partner, Airbus Helicopters."
In early 2015 Raytheon was awarded a contract for 35 million dollars to deliver air-to-air FIM 92 Stinger missiles for ROK AH-64E Apache helicopters. The Apache deal was concluded with Boeing in April 2013 and will lead to the delivery of 36 helicopters starting in 2016 and concluding in 2018.

Following government certification in 2012, 16 **KAI Surion Korean Utility Helicopters (KUH-1 Surion)** were delivered to the army by 2014 testing. The number is expected to reach around 200 by 2020.

**Unmanned Aerial Vehicles**

- Heron I unmanned aircraft system (UAS) was selected by the Korean government to serve at the corps-level in December 2014. Produced by Israel Aerospace Industries’ (IAI’s) the Heron I will replace the Night Intruder 300 as the corps-level UAV system.
- In 2013 the South Korean government agreed to purchase 120 Foosung Group RemoEye 002B UAS vehicles. Deliveries were expected to start in the fall of 2015.
- IHS Jane’s confirmed in January 2016 via company comment that Korean Air Aerospace Division (KAL-ASD), had gained a contract with the South Korean government to build a tactical UAV system. The system with fulfill an ISR role and it is expected to be operational starting in 2018.

**Fighter Jets**

- South Korea, in collaboration with Indonesia, has long in pursuit of a **KFX/IFX** program which they will eventually use to replace the F-16C/D. The production number is expected to be around 120 and will enter service in 2020. KAI and Lockheed Martin have partnered in a 8 billion dollar contract.

- **F-X fighter:**
  
  “**Phase I:** In 2002 Boeing’s F-15K Slam Eagle strike fighter was selected for the first phase of the F-X program, which aims to replace RoKAF’s inventories of F-4 and F-5 fighters. A total of 40 aircraft were ordered in Phase I at a total cost of USD4.2 billion, all of which had been delivered by mid-2008.

  **Phase II:** In 2008 South Korea signed a contract with Boeing for 21 additional F-15K Slam Eagles (20 plus an attrition replacement aircraft). The company was the sole bidder for the estimated USD2.4 billion contract for Phase II.

  **Phase III:** On 24 September 2014 South Korea approved a deal to acquire 40 Lockheed Martin F-35A JSFs to satisfy the FX-III requirement for about KRW7.3 trillion. Deliveries to South Korea of the F-35A will start in 2018, according to USAF Lieutenant General Chris Bogdan, program executive officer for the F-35 Lightning II Joint Program Office. The RoKAF originally planned to buy 60 aircraft to replace the 1970s-era McDonnell Douglas F-4E Phantom IIs. However, the original cost estimate of USD10.8 billion prompted a reduction to just 40 aircraft.”

**Air Defense Radar**

- South Korea announced in December 2013 that it is producing “low-altitude air-defense radar”. This has been named the LIG Nex1 FPS-303K.

- “**Patriot:** In November 2014 the United States approved the sale to South Korea of Patriot Advanced Capability (PAC-3) missiles, with associated equipment, parts, and logistical support for an estimated cost of USD1.405 billion. South Korea requested the sale of 136 PAC-3 missiles with containers and two flight test targets [Patriot-As-A-Target] modified short-range tactical ballistic missiles. Also included are two PAC-3 telemetry kits, 10 fire solution computers, 18 launcher stations modification kits, eight missile round trainers, eight PAC-3 Slings, 10 Patriot automated logistics system kits, 13 installation kits for TPX-58 identification friend or foe (IFF) with KIV-77, PAC-3 ground support equipment (GSE), 10 shorting plugs, 77 Defence Advanced Global Positioning Receivers (DAGRs) and installation kits, Patriot fiber-optic modem, eight guided missile transporters, four AN/VRC-90E radios with installation kits, spare and repair parts, support equipment, communication equipment, publications and technical documentation, personnel
training and training equipment, US government and contractor logistics and technical support services, quality assurance teams' support, and other related elements of logistics and program support.

The RoKAF-operated PAC-3 missiles will permit more effective BMD operations, while serving as a core component to RoK's future Korea Air Missile Defence (KAMD). The PAC-3s will supplement six batteries of PAC-2 Patriots obtained second-hand from Germany that are also scheduled for upgrade to PAC-3 standard.\[51\]

**Air-to-air weapons**

- South Korea submitted a request to the US Defense Security Cooperation Agency to purchase Raytheon AIM-9X-2 Sidewinder Block II air-to-air missiles.

**Air-to-surface weapons**

- In 2013 South Korea completed a procurement of Taurus KEPI 350 air-to-ground standoff cruise missiles.

**Submarines**

- “The RoKN has embarked on an ambitious three-phase program to upgrade the submarine force:
  - Phase 1: Modernize nine older (Type 209/1200) KSS-I Chang Bogo submarines.
  - Phase 2: Build and commission nine advanced (Type 214) KSS-2 submarines by 2017, and at least nine larger, more capable KSS-3 boats beginning in 2020, thereafter retiring the Type 209s.
  - Phase 3: Replace the existing KSS-1 Dolgorae-class midget submarine force with Cosmos class midgets and a new KSS-500A class.”\[52\]

**Frigates**

- Incheon-class: In August and October 2014 South Korea's STX Offshore & Shipbuilding launched the RoKN's fourth and fifth Incheon-class guided-missile frigates at its facility in Changwon, Gyeongsangnam-do. Both will be commissioned in the second half of 2015 and should be fully operational by 2016. These are the first two Incheon-class frigates built by STX. The three previous ships in the class - Incheon (FFG-811), Gyeonggi (FFG-812), and Jeonbuk (FFG-813) - were built by HHI.

  The Incheon-class was developed to replace Ulsan-class frigates and Dong Hae- and Po Hang-class corvettes, and are intended to deliver improved anti-air warfare (AAW) and ASW capabilities. Requirements call for at least 20 ships, with construction continuing into the 2020s.

**Maritime helicopters**

- In 2013 South Korea chose the AgustaWestland AW159 to be their naval ASW helicopter.

**Comparing the Military Resources Shaping the Korean Balance**

It is not possible to make reliable comparisons of DPRK and ROK military expenditures using unclassified data. In the past, the US Department of State (DOS) issued comparable unclassified estimates of military efforts and arms transfers based on US intelligence models that estimated the size of each military effort based on comparable prices. These reports have long been discontinued, however, and no think tank or NGO has the resources or access to intelligence to make such estimates on its own.

Neither the DPRK nor the ROK provides unclassified official comparisons based on its own intelligence data and net assessments, and neither the International Institute for Strategic Studies (IISS) nor the Stockholm International Peace Research Institute (SIPRI) make estimates for the DPRK. Estimates of Chinese military expenditures are also controversial and raise major questions
regarding the extent to which definitions of such estimates are comparable in terms of both what is included, the level of state control over the resource involved and market versus state “prices.”

Moreover, there is no clear way to assess US military spending on the Korean balance and related power projection costs, although US military capabilities play a major role in that balance.

It is still possible, however, to make some broad comparisons of the economic bases and military expenditures of the primary countries that shape the Korean military balance, including the DPRK.

In spite of the uncertainties in the data, it is clear that the ROK has a far greater capacity to develop and support its forces than the DPRK. As Figure VI.13 shows, the CIA estimated in June 2014 that the DPRK had an economy that was far less developed than that of the ROK.\textsuperscript{53} Over the past decade, the DPRK’s rankings in these key economic indicators have been decreasing, while those of the ROK have been steadily increasing.

Furthermore, the CIA estimated that the DPRK had a total population of 25.0 million in 2016, while the ROK’s population was 49.1 million, or nearly 2.1 times that of the DPRK. The ROK’s population was, however, aging more rapidly. The CIA estimated the median age of the DPRK’s population at 33.6 years, and that of the ROK at 40.8 years. Finally the CIA estimated in 2012 that the DPRK had 6.5 million males available for military service and 207,737 young men entering military age each year, while the ROK had 13.2 million available males and 365,760 males entering military age.\textsuperscript{54} The length of military service for the ROK is approximately 2 years, while that of the DPRK is approximately 5-10.

As the earlier comparisons of CIA estimates of GDP and per capita income have shown, the ROK has far more resources to use in supporting its national security structure than the DPRK and that overall trends will remain significantly in the ROK’s favor. The World Bank and UN make somewhat different estimates of the size of the ROK and DPRK’s resources, but all agree that the ROK has a vastly larger economy, far better income distribution and personal wealth, and far more personnel that can be devoted to military service. The ROK’s disadvantages in this area are that its population has much higher expectations, it must pay far more for manpower, it must price military investment in market rather than command terms, and it is harder for the ROK to command popular sacrifices in the name of enhanced security.
### Figure VI.13: Comparisons of Key Country-Level Indicators

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP (PPP)$^{55}$ (in $US Trillion), (year)</th>
<th>GDP (PPP) per capita ($US)</th>
<th>Total Population (millions), (year)</th>
<th>Median population age</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>19.39 (2015)</td>
<td>14,100</td>
<td>1367.4 (July 2015 est.)</td>
<td>36.8</td>
</tr>
<tr>
<td>Japan</td>
<td>4.83 (2015)</td>
<td>38,100</td>
<td>126.9 (July 2015 est.)</td>
<td>46.5</td>
</tr>
<tr>
<td>Russia</td>
<td>3.72 (2015)</td>
<td>25,400</td>
<td>142.4 (July 2015 est.)</td>
<td>39.1</td>
</tr>
<tr>
<td>US</td>
<td>16.72 (2013)</td>
<td>52.8</td>
<td>321.3 (July 2015 est.)</td>
<td>37.8</td>
</tr>
<tr>
<td>ROK</td>
<td>1.849 (2015)</td>
<td>36,500</td>
<td>49.1 (July 2015 est.)</td>
<td>40.8</td>
</tr>
<tr>
<td>DPRK</td>
<td>.04 (2014)</td>
<td>1,800</td>
<td>24.9 (July 2015 est.)</td>
<td>33.6</td>
</tr>
</tbody>
</table>

Korean and East Asian Military Spending – Less the DPRK

In spite of the problems in comparing military expenditures, it seems likely that the IISS is broadly correct in estimating that Asian nominal defense spending overtook NATO Europe’s spending in 2012. The IISS estimates Asian spending rising from $268.4 billion in 2011 to $287.4 billion, while NATO spending fell from $290.0 billion to $262.7 billion over the same period.

Asian spending began to exceed official European defense spending in 2012, including non-NATO countries. Excluding Australia and New Zealand, nominal defense spending in Asia rose from $261.7 billion in 2010 to $321.8 billion in 2013, a 23% increase. Real defense spending in Asia rose “with real 2013 defense outlays 13.2% higher than in 2010.”

The most the CIA provides in the military expenditures section of its World Factbooks has been an estimate that the ROK spent 2.8% of its GDP on defense, a statistic from 2012. The CIA presents no date or information for North Korea. Unfortunately, the numbers presented in other open sources are often questionable and/or lack comparability, and data are often missing for the DPRK. Figure VI.14 to Figure VI.18 do, however, provide data from leading sources that probably do provide a broadly accurate picture

- **Figure VI.14** depicts the IISS’s estimates of national defense spending as a percentage of GDP for 2009-2015.
- **Figure VI.15** shows SIPRI’s estimates of the military expenditures of the countries involved on the Korean Peninsula as a percentage of GDP over 2000-2013.
- **Figure VI.16** gives the IISS’s estimates of defense expenditures from 2009-2015.
- **Figure VI.17** assesses SIPRI’s military expenditures data from 2000-2013.
- **Figure VI.18** shows the IISS’s estimates of per-capita defense expenditures during 2009-2015.
**Figure VI.14: IISS Estimate of National Defense Budgets as a Percentage of GDP, 2009–2015**

<table>
<thead>
<tr>
<th>Year</th>
<th>US</th>
<th>Russia</th>
<th>Japan</th>
<th>China</th>
<th>DPRK</th>
<th>ROK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>3.33</td>
<td>4.18</td>
<td>1</td>
<td>1.28</td>
<td></td>
<td>2.4</td>
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<tr>
<td>2014</td>
<td>3.48</td>
<td>3.47</td>
<td>1</td>
<td>1.27</td>
<td></td>
<td>2.4</td>
</tr>
<tr>
<td>2013</td>
<td>3.8</td>
<td>3.18</td>
<td>0.99</td>
<td>1.22</td>
<td></td>
<td>2.41</td>
</tr>
<tr>
<td>2012</td>
<td>4.12</td>
<td>3.06</td>
<td>0.99</td>
<td>1.24</td>
<td></td>
<td>2.52</td>
</tr>
<tr>
<td>2011</td>
<td>4.56</td>
<td>2.79</td>
<td>1.02</td>
<td>1.24</td>
<td></td>
<td>2.54</td>
</tr>
<tr>
<td>2010</td>
<td>4.76</td>
<td>2.84</td>
<td>1</td>
<td>1.3</td>
<td></td>
<td>2.48</td>
</tr>
<tr>
<td>2009</td>
<td>4.68</td>
<td>3.06</td>
<td>0.99</td>
<td>1.41</td>
<td></td>
<td>2.1</td>
</tr>
</tbody>
</table>

Figure VI.15: SIPRI Estimate of Military Expenditures as a Percentage of GDP, 2000–2015

Figure VI.16: IISS Estimate of Northeast Asian Defense Expenditures, 2009–2015 (US$ billions)

<table>
<thead>
<tr>
<th>Year</th>
<th>US</th>
<th>Russia</th>
<th>Japan</th>
<th>China</th>
<th>DPRK</th>
<th>ROK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>661</td>
<td>38.3</td>
<td>50.3</td>
<td>70.4</td>
<td>4.4</td>
<td>33.5</td>
</tr>
<tr>
<td>2010</td>
<td>690.9</td>
<td>42</td>
<td>54.4</td>
<td>76.4</td>
<td>25.1</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>687</td>
<td>51.6</td>
<td>59.8</td>
<td>90.2</td>
<td>28.3</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>645.7</td>
<td>59.9</td>
<td>59.4</td>
<td>102.4</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>633.4</td>
<td>66.1</td>
<td>48.7</td>
<td>115.8</td>
<td>31.5</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>603.4</td>
<td>64.5</td>
<td>46.1</td>
<td>131.4</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>597.5</td>
<td>51.6</td>
<td>41</td>
<td>145.8</td>
<td>33.4</td>
<td></td>
</tr>
</tbody>
</table>

Figure VI.17: SIPRI Estimate of Northeast Asian Military Expenditures, 2000–2015 (in constant 2011 US$ billions)

Figure VI.18: IISS Estimate of Northeast Asian Per Capita Defense Expenditures, 2009–2015 (US$)

DPRK

Even though the DPRK is one of the most militarized countries in the world, the previous Figures have already shown how difficult it is to provide any analysis of the scope of its spending. Some trends, however, are clear.

*Militarizing a Crippled Economy*

Regardless of the uncertainties in some of the data, it is clear that the DPRK’s limited financial resources are a key factor in assessing what types of strategies it may employ in the case of any escalation on the Peninsula. The CIA draws a sharp contrast between the economies of the DPRK and the ROK in 2016. Its World Factbook estimated that the DPRK’s GDP was $40 billion in 2015 in purchasing power party terms, and its per capita income was only $1,800. In contrast, it estimated that the ROK’s GDP was $1.8 trillion in 2015 in purchasing power party terms, and its per capita income was $36,500.59

North Korea, one of the world's most centrally directed and least open economies, faces chronic economic problems. Industrial capital stock is nearly beyond repair as a result of years of underinvestment, shortages of spare parts, and poor maintenance. Large-scale military spending draws off resources needed for investment and civilian consumption. Industrial and power outputs have stagnated for years at a fraction of pre-1990 levels. Frequent weather-related crop failures aggravated chronic food shortages caused by ongoing systemic problems, including a lack of arable land, collective farming practices, poor soil quality, insufficient fertilization, and persistent shortages of tractors and fuel.

The mid 1990s were marked by severe famine and widespread starvation. Significant food aid was provided by the international community through 2009. Since that time, food assistance has declined significantly. In the last few years, domestic corn and rice production has been somewhat better, although domestic production does not fully satisfy demand. A large portion of the population continues to suffer from prolonged malnutrition and poor living conditions. Since 2002, the government has allowed informal markets to begin selling a wider range of goods. It also implemented changes in the management process of communal farms in an effort to boost agricultural output.

In December 2009, North Korea carried out a redenomination of its currency, capping the amount of North Korean won that could be exchanged for the new notes, and limiting the exchange to a one-week window. A concurrent crackdown on markets and foreign currency use yielded severe shortages and inflation, forcing Pyongyang to ease the restrictions by February 2010. In response to the sinking of the South Korean warship Cheonan and the shelling of Yeonpyeong Island in 2010, South Korea’s government cut off most aid, trade, and bilateral cooperation activities, with the exception of operations at the Kaesong Industrial Complex.

North Korea continued efforts to develop special economic zones and expressed willingness to permit construction of a trilateral gas pipeline that would carry Russian natural gas to South Korea. North Korea is also working with Russia to refurbish North Korea’s dilapidated rail network and jointly rebuilt a link between a North Korean port in the Rason Special Economic Zone and the Russian rail network.

The North Korean government continues to stress its goal of improving the overall standard of living, but has taken few steps to make that goal a reality for its populace. In 2013-14, the regime rolled out 20 new economic development zones - now totaling 25 - set up for foreign investors, although the initiative remains in its infancy. Firm political control remains the government’s overriding concern, which likely will inhibit changes to North Korea’s current economic system.

… South Korea over the past four decades has demonstrated incredible economic growth and global integration to become a high-tech industrialized economy. In the 1960s, GDP per capita was comparable with levels in the poorer countries of Africa and Asia. In 2004, South Korea joined the trillion-dollar club of world economies.

A system of close government and business ties, including directed credit and import restrictions, initially made this success possible. The government promoted the import of raw materials and technology at the expense of consumer goods and encouraged savings and investment over consumption.
The Asian financial crisis of 1997-98 exposed longstanding weaknesses in South Korea’s development model, including high debt/equity ratios and massive short-term foreign borrowing. GDP plunged by 7% in 1998, and then recovered by 9% in 1999-2000. South Korea adopted numerous economic reforms following the crisis, including greater openness to foreign investment and imports. Growth moderated to about 4% annually between 2003 and 2007.

South Korea’s export focused economy was hit hard by the 2008 global economic downturn, but quickly rebounded in subsequent years, reaching over 6% growth in 2010. The US-Korea Free Trade Agreement was ratified by both governments in 2011 and went into effect in March 2012. Between 2012 and 2015, the economy experienced slow growth – 2%-3% per year - due to sluggish domestic consumption and investment. The administration in 2015 faced the challenge of balancing heavy reliance on exports with developing domestic-oriented sectors, such as services.

The South Korean economy’s long-term challenges include a rapidly aging population, inflexible labor market, dominance of large conglomerates (chaebols), and the heavy reliance on exports, which comprise about half of GDP. In an effort to address the long-term challenges and sustain economic growth, the current government has prioritized structural reforms, deregulation, promotion of entrepreneurship and creative industries, and the competitiveness of small- and medium-sized enterprises.

In terms of the DPRK’s capacity for military action, an IISS study published in 2013 noted that:

Although it is difficult to know North Korea’s precise intentions or aspirations, its forces are deployed along the DMZ in such a manner that they could support an invasion of South Korea. In particular, the percentage of North Korean forces deployed within 100km of the DMZ has significantly increased during the past two decades. Currently, North Korea deploys approximately 65% of its military units, and up to 80% of its estimated aggregate firepower, within 100km of the DMZ. This inventory includes approximately 700,000 troops, 8,000 artillery systems and 2,000 tanks. Because of these forward deployments, North Korea could theoretically invade the South without recourse to further deployments and with relatively little warning time.

Thus, it has been argued that North Korea’s military strategy is designed around plans to launch an invasion of South Korea. At the same time, North Korea’s armed forces are also positioned in order to deter an attack, being deployed to deliver a pre-emptive strike against the South if Pyongyang believes that an attack is imminent or to retaliate with overwhelming force if the North is attacked. This posture is dictated by the doctrine that ‘attack is the best form of defence’, a formulation that defined Soviet forward deployments in East Germany during the Cold War. The mass forward deployment of North Korean forces also helps to strengthen domestic political support for Pyongyang’s ‘military first’ policy and heavy internal security apparatus.

The 2016 IISS report expressed heavy skepticism about the DPRK’s various warfighting capabilities:

North Korea’s armed forces remain dependent on increasingly obsolete equipment of Russian and Chinese origin, including indigenous derivatives. The recent appearance of freshly painted combat aircraft only disguises the underlying lack of new airframes over the past two decades, and there is only limited evidence of modernization across the services. North Korea’s capability is arguably more reliant on its substantial personnel strength and its potential for asymmetric warfare. Whilst exercises are regularly conducted, they often appear staged and as such are not necessarily representative of wider operational capability. Though North Korean progress on nuclear-warhead miniaturization continues to be debated, its pursuit of missile delivery capability remains a priority. US officials now view the so-far-untested Hwasong-13 (KN-08) road-mobile ICBM as operational, a position perhaps reinforced by the subsequent parade appearance of a redesigned model, in contrast to previous mock-ups.
Guesstimating the DPRK’s Military Spending

The DPRK does everything possible to disguise the level of its military effort, and this makes it difficult to find any unclassified estimates of the DPRK’s annual military spending. There are, however, some useful unclassified estimates. A report by Jon Grevatt in Jane’s Defense Weekly in 2009 provided some insights, but must again be treated as a rough estimate:61

The DPRK’s defense budget reached nearly USD 9 billion in 2009, around 15 times more than the official amount declared by Pyongyang, the [ROK] state-run Korea Institute of Defense Analyses (“KIDA”) has said in a report...The KIDA report—cited by the [ROK] state-funded Yonhap news agency on 18 January—said North Korea had previously announced a USD 570 million defense budget, although the real expenditure, calculated on an exchange rate based on Purchasing Power Parity (“PPP”) terms, was USD 8.77 billion...Yonhap quoted the report as saying, “In spite of its economy shrinking since the mid-2000s, North Korea has gradually increased its military spending.”

According to KIDA, official North Korea figures state that the defense budget increased to USD 570 million in 2009 from USD 540 million in 2008, USD 510 million in 2007 and USD 470 million in 2006, although these figures do not reflect PPP...Previous estimates have indicated that DPRK defense spending is equal to at least 15 per cent of [Gross Domestic Product] (“GDP”). In 2008 Pyongyang said it was allocating 15.8 percent of GDP on defense although it has not released any GDP figures for a number of years. In 2009 the US Department of State stated that the DPRK’s defense spending was more than 22 percent based on its estimate that the DPRK’s GDP in 2009 was USD 40 billion based on PPP...How much North Korea is allocating towards defense procurement is similarly contested but it is thought to be at least 40 per cent of its expenditure, with most of these finances directed at centrally controlled indigenous programs: a consequence of the DPRK’s impoverished economy and its international isolation.62

The ROK’s state-run Korean Institute of Defense Analyses [KIDA] reported that the total gross national income of the DPRK in 2009 was approximately $25 billion, meaning that the DPRK spent about a third of its national income on its military.63

The 2014 Japanese Defense White Paper noted that:64

Although North Korea has been facing serious economic difficulties and has depended on the international community for food and other resources, it seems to be maintaining and enhancing its military capabilities and combat readiness by preferentially allocating resources to its military forces. North Korea deploys most of its armed forces along the DMZ. According to the official announcement at the Supreme People’s Assembly in April 2014, the proportion of the defense budget in the FY2014 national budget was 15.9%, but it is believed that this represents only a portion of real defense expenditures.

Again, it must be stressed that these numbers are little more than educated guesses, though they are almost certainly correct in indicating that the DPRK is willing to devote far more of its total economy to national security expenditures than the ROK. Given a DPRK GDP that experts estimate is around $40 billion and the size of the DPRK’s forces, it also seems likely that Western, ROK, and Japanese estimates that DPRK military spending is close to $9-11 billion are far more accurate than the DPRK’s official military budget of $1 billion.65

The DPRK’s Defense Industry

In spite of its weak economy, the DPRK still maintains a significant defense industry, following the ideas of juche and songun described in Chapter I. A ROK think tank analysis by Tak Sung Han in 2013 still provides a useful overview of the history and current status of this sector. The development of the defense industry started in the 1950s with the “preparation stage,” as the DPRK built or rebuilt factories and produced munitions and small arms with the help of the USSR and China. The 1960s saw the “foundation stage,” when the DPRK expanded its production base, initiating development and increased production of conventional firearms by copying Chinese and
Soviet models. The “expansion stage” of the 1970s increased the emphasis on quality and modern technology, moving to indigenous production of many weapons types – such as tanks, self-propelled artillery, and combat vessels.  

Tak Sung Han feels that since the 1990s, the DPRK:

...has maintained or increased the production level of its ammunitions, missiles, nuclear weapons, strategic materials, and other export-oriented products, and accelerated the technological development in spite of overall production reduction in the defense industry. As a result, North Korea has achieved the top-class level in certain military technologies including missiles, nuclear and bio-chemical weapons. Moreover, North Korea displays high-level military technologies in ammunitions, artillery, and maneuvering equipment. Even though North Korea’s technological level in aircraft, communications, and electronics is quite low, there has been substantial progress in digital weapons and jamming devices.

The “sophisticated development stage” spanned the 1980s and 1990s, when the DPRK further improved quality and modern technology. During this period, North Korea developed and produced missiles, nuclear weapons, and aircraft. In the 2000s, the DPRK “accelerated its efforts to improve existing weapons systems, develop GPS jamming devices, and advance asymmetric weapons technologies such as missiles and nuclear weapons, rather than increasing the quantity of conventional weapons that have already reached a saturation point.”

Tak Sung Han indicates there are three primary economic sectors in the DPRK – civilian, military, and “royal.” The latter two receive national priority in manpower and resources. In particular, the defense industry is the foundation of the DPRK’s military power and identity, employing approximately 500,000 workers and accounting for 25-75% of the economy. While the DPRK’s defense industry operated at 80% of capacity in the 1980s, this fell to 38% in the early 1990s and 22% in the late 1990s. Over the past decade, operating capacity has recovered somewhat and currently stands at approximately 30%. Production peaked at $3-4 billion in the 1980s and is likely currently around $1-1.2 billion.

He also estimates that the DPRK’s economic development can be divided into three periods. Since the 1990s: “Arduous March” (1990-98), economic recovery (1999-2005), and now economic stagnation (2006-present). In each period, the DPRK tried to boost the defense industry despite economic hardship – as shown in Figure VI.19. In spite of the -4.18% average economic growth rate over 1990-98, the DPRK still maintained a 30.5% defense industry operating rate, compounding and prolonging the country’s economic crisis. From 1999-2005, economic growth reached 2.74%, during which time the defense industry’s operation rate was 24.9%. From 2001-06, economic growth dropped to .05%, and the industry’s operating rate rose back to 30.9%.

Jane’s Sentinel Security Assessment from December 2015 notes regarding North Korea’s budget and defense industry:

Assessing North Korea’s actual defence budget is problematic since it only publishes fragmentary economic information, and then primarily for propaganda purposes. At the April 2014 annual meeting of the Supreme People's Assembly, North Korean Finance Minister Choe Kwang-jin informed the assembled members that the government had allocated 15.9% of its annual budget to national defence. However, the minister did not disclose what the total annual budget was, making it difficult to estimate the actual amount represented.

Both South Korean and US intelligence sources have variously estimated that the actual amount North Korea allocates to defence is equivalent to 25-30% of its gross domestic product (GDP). If the Bank of Korea’s (South Korea) 2015 estimate for North Korea’s 2014 GDP of KPW34.2 trillion (USD25.96 billion) is correct, this would represent KPW5.43-10.26 trillion (USD4.13-7.79 billion) available for defence spending. Historically, North Korea’s ‘military first’ policy has ensured that priority is given to defence spending. While
how much it is allocating towards defence procurement is similarly contested, it is thought to be at least 40% of its expenditure. Most of these finances are directed at centrally controlled indigenous programs.

Figure VI.19: The DPRK’s Economic Growth Rate and the Defense Industry’s Average Operating Rate

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Growth Rate</td>
<td>-4.18%</td>
<td>2.74%</td>
<td>0.05%</td>
</tr>
<tr>
<td>(On Average)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Rate of</td>
<td>30.5%</td>
<td>24.9%</td>
<td>30.9%</td>
</tr>
<tr>
<td>Defense Industry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(On average)</td>
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### ROK

The ROK makes a sharp contrast to the DPRK. It has become one of the most advanced economies in Asia and now has a technology base that, in some areas, rivals that of the most advanced economies in the world. As Figure VI.13 has already indicated, the CIA estimates that the DPRK’s GDP was roughly $40 billion in 2014 in purchasing power parity terms (114th the world), and the ROK’s GDP in 2016 was approximately $1.85 trillion (14th in the world). This made the ROK’s GDP some 46 times larger. The DPRK had an estimated GDP per capita of $1,800 in 2014 (210th in the world), while the ROK’s GDP per capita was 20 times higher, at $36,500 (48th in the world). While the DPRK inherited a far larger industrial base after World War II, and was the more developed of the two economies for several decades after the Korean War, the ROK has vastly outpaced its rigid, over-militarized rival.
Defense Economics, Defense Spending, and Defense Reform

As noted earlier, the CIA portrays South Korea's economy in a far more positive light than that of the DPRK.\textsuperscript{73} The ROK has, however, had to devote significant resources to defense spending and military modernization. The economy’s capacity to continue such development is essential for ROK preparedness in a potential conflict on the Peninsula.

Figure VI.20 shows past ROK and Japanese estimates of ROK defense spending and annual growth rates over 2006-2010. Figure VI.21 compares the data in the ROK’s 2013 defense budget to reporting on the overall ROK government budget and GDP from 2009-2013, showing spending by key category in the 2013 budget.

According to SIPRI, the 2014 budget totaled 35.7 billion, accounting for 2.6% of ROK GDP. This was the fourth largest national spending category, after healthcare, welfare, and labor; general public administration; and education. The increases focused on troop operation expenses, maintenance of combat capability expenses, and defense capability improvement expenses.\textsuperscript{74}

The ROK’s military expenditures amounted to $36.4 billion in 2015, or approximately 2.6 percent of the country’s GDP, while the IISS reports government spending at $33.4 billion, roughly $683 per person.\textsuperscript{74} The ROK’s FY2016 defense budget showed an increase of approximately 3.6% over the previous year down from 4.9% in 2015. Still, it marked the 17\textsuperscript{th} consecutive year-on-year rise.\textsuperscript{75}

The steadily rising levels of ROK defense spending reflect that fact the ROK is undergoing a defense reform project with an ultimate goal, according to the ROK Ministry of National Defense (MND) Deputy Ministry for Planning and Coordination, “to build a ‘slim but strong military.’” The government plans to maintain fiscal soundness in budgeting, seeing mid- and long-term defense spending as a percentage of GDP and as a percentage of the government budget remaining approximately the same.\textsuperscript{76}

Past commentary on the 2012 budget helps explain the more current trends and how they affect the balance. An analysis by Kim Kwang-woo, Deputy Minister for Planning and Coordination at the ROK MND, writing for the government-supported Korea Institute for Defense Analyses (KIDA), explained the 2012 budget’s force maintenance and force improvement projects in detail.\textsuperscript{77}

In order to foster a “combat-oriented” military, the Force Maintenance budget for the year 2012 prioritizes maximizing war-fighting capability by tightening military operation and watch systems on the front line and expanding scientific combat training equipment and personal combat equipment. It also focuses on improving the working and living conditions for military service members as well as boosting their morale and welfare by advancing military medical services and improving their living quarters. Consequently, the expenses for military uniforms, military service member health and welfare enhancement, military personnel management, and training and education show a rapid year-on-year increase of more than 10 percent.

The budget for dispatching ROK Forces overseas was set at KRW 22.6 billion, with 21.6 billion allotted for sending troops to multi-national forces (MNF) and 1 billion for PKO activities. The overseas deployments of the Cheonghae Unit (Somali Waters), the Danbi Unit (Haiti) and the Dongmyeong Unit (Lebanon), scheduled to end in late 2011, will continue their PKO activities with the ROK National Assembly approving a bill to extend the dispatch period for the three Units by one year until the end of 2012. As of January 1st, 2012, there are 1,448 Korean troops deployed in 18 areas of 15 countries.

Meanwhile, the cost for defense cost-sharing under the Special Measures Agreement on Defense Cost-sharing from 2009 to 2013 amounts to KRW 746.1 billion, taking into account past budget execution results and the estimated size of future spending.
The 2012 Force Improvement Programs (FIPs) budget prioritizes reinforcement of deterrence capabilities to actively cope with North Korean infiltration/local provocation as well as the threat of long-range artillery. Additionally, in preparation for the OPCON transition in 2015, the budget prioritizes on improving the command and control capacity of the ROK Joint Chiefs of Staff and strengthening core combat capabilities of each service. North Korea bombarded Yeonpyeong-do, an island within the territory of the Republic of Korea, on November 23, 2011. Since the YP-do shelling incident, the ROK Armed Forces have further fortified emergency shelters and protective facilities to ensure sustainability and survivability in the northwestern frontline islands.

To actively cope with various future threats, the ROK Armed Forces aim to secure strategic capabilities. Accordingly, projects for acquiring advanced fighter aircrafts, new submarines, and modernized destroyers are being planned. Along with projects to introduce new weapons systems, the ROK Forces are also improving existing ones. Performance improvement for the K1A1 tank, maritime patrol aircrafts, and KF-16 fighter jets are also underway.

Meanwhile, to prepare for the OPCON transition, the ROK Armed Forces are planning to newly develop or upgrade modeling & simulation systems and war-gaming simulation facilities, which are mainly led by the ROK Armed Forces, and expenses for such performance improvements are reflected in the 2012 defense budget. In a bid to develop ability to produce indigenous advanced weapons systems, the investment in defense R&D has been expanded to 7.0% of the total defense budget, up from 6.4% in the previous year.

The defense budget still increased by a substantial 3.5%, although a need for local economic stimulus did lead to defense cuts in 2014, An analysis by KIDA described the details of the 2014 budget as follows:78

The 2014 ROK defense budget was drawn up with a focus on the following objectives: maintenance of steadfast military readiness posture by strengthening the combat capability of frontline units and providing necessary logistics support, enhancement of military personnel welfare to boost their morale, and reinforcement of core combat capabilities to counter asymmetric threats and local provocations. Simultaneously, great efforts were made to eliminate waste and economize budget use.

South Korea’s 2014 defense budget comes to about KRW 35.7 trillion, a 3.5% increase over that of 2013 (based on supplementary budget). It also accounts for 2.5% of the GDP (based on estimated figures) and 14.4% of the government budget (general accounts). The defense budget is the fourth largest after the budgets for health, welfare, and employment (KRW 97.4 trillion), general and provincial administration (KRW 55.8 trillion), and education (KRW 49.8 trillion), among the 12 categories of the government budget.

By item, the Force Operating Costs, which fall under the responsibility of the Ministry of National Defense (MND), stand at KRW 25.19 trillion, a 3.6% year-on-year increase, and Force Improvement Budget2, which falls under the responsibility of the Defense Acquisition Program Administration (DAPA), amounts to KRW 10.5 trillion, a 3.3% year-on-year increase. Defense capability improvement expenses were increased by 3% in the 2014 budget, compared to increases of a little over 2% for the past two years, despite a deep cut (KRW 366.4 billion) in the budget for the next-generation fighter aircraft projects caused by a delay in determining the final candidate. Apparently, this increase in Force Improvement Budget was the result of positive efforts made to enhance defense capabilities by the Government and the National Assembly. Another indicator of the positive view held by the National Assembly members regarding the need for a stable defense budget is a significantly reduced cut of KRW 94.5 billion in the defense budget deliberation process this year, compared to a cut of KRW 189.8 billion in the 2013 budget.

The 2014 Force Operating Costs focus on enhancing the troops’ combat survival ability and maximizing their combat capability by improving the quality of uniforms and equipment and furnishing more training equipment and supplies. The monthly salary for enlisted soldiers was increased by 15% over the preceding year, and the basic meal expense was increased by 6.5%. These expense increases reflect the need to improve the barracks and recreation facilities in order to improve military welfare.

The 2014 defense budget also considered the need to replace or update exiting combat support facilities in order to ensure adequate logistics support capability and a higher rate of operation of recently adopted core equipment, such as AWACS, by securing maintenance expenses. As a result of these considerations, logistics
support and collaboration programs showed a 7.2% year-on-year increase in funding, far exceeding the percentage of year-on-year increase of the entire Force Operating Costs.

The 2014 budget for troops dispatched overseas, including the Araw Unit dispatched to the Philippines in December 2013 to provide disaster relief, comes to KRW 126.8 billion, a KRW 31.7 billion increase from 2013. Amounts of KRW 78.7 billion and KRW 48.1 billion were allocated for the dispatch of ROK troops to the Multinational Force and the UNPKO, respectively. As of January 1, 2014, the number of ROK troops dispatched overseas stands at 1,690 in 17 areas in 16 different countries.

As for the Force Improvement Budget, priority was given to the early establishment of the Kill Chain and the Korea Air and Missile Defense (KAMD) system to counter the North’s asymmetric threats, including nuclear weapons and ballistic missiles. The 2014 defense budget includes the installation of artillery locating radar systems, next-generation thermal imaging cameras and surveillance systems, and the GOP Scientific Guard System in an effort to deter the North’s local provocations and enhance the country’s capability to deal with any provocations.

The ROK military plans to strengthen its future-oriented defense capabilities to counter diverse potential threats. Such efforts include adoption of next-generation Multiple Launch Rocket System (MLRS) and high-performance jet fighters, new submarine projects, and additional procurement of AEGIS warships, in addition to improving the performance of its KF-16 fighter jets.

Part of the budget has also been allocated to securing the country’s endogenous weapons system through defense R&D. The 2014 defense budget includes a plan for the development of next-generation Korean-made fighter jets and small-sized gunships. The budget also shows a drastic increase in funding for the development of core technologies and military and civilian “dual use technologies,” which is in step with the Park Geun-hye government’s goal of creating a “creative economy.”

The 2014 Special Accounts allocated to the MND include funding for the relocation of defense and military facilities (KRW 356 billion), the relocation of USFK bases (KRW 641.8 billion), and the construction of an ‘Innovative City’ (KRW 26.9 billion).

As for the Special Account for the relocation of USFK bases, an amount, which was increased by KRW 188.2 billion over the preceding year, is earmarked for full-fledged promotion of the said relocations. The Special Account also includes the Phase-2 Project for the relocation of USFK bases to Pyeongtaek, the Land Partnership Plan (LPP), the support programs for Pyeongtaek, and a project to investigate and deal with environmental pollution associated with the relocation of USFK bases. The Phase-2 Project for the relocation of USFK bases to Pyeongtaek concerns the base in Yongsan, Camp Nimble/H-220 (in Dongducheon), Camp Market (in Bupyeong), and Camp Kim (in Seoul). Its work progress stands at 62.1% as of the end of 2013, and a total of 26 USFK bases have been returned to the ROK government, with 21 more USFK bases to be returned in the future.

Special Account for the construction of the ‘Innovative City’ includes the project for the relocation of the National Defense University (KNDU) to Nonsan, Chungnam-do, by 2016.

Independent evaluations by groups like the IISS describe the trends in the ROK’s military spending as follows:79

Defence outlays over the next five to ten years will be driven by the need to meet threats from North Korea, modernization imperatives, reducing the size of the armed forces, and moving to a ‘leaner’ and ‘smarter’ force. The armed forces’ ability to achieve the latter two objectives depends on balanced investments between the services, given the historic army lead. As Seoul prepares for the transfer of full OPCON in 2015, some analysts think that it may be called on to shoulder an increased portion of the defence burden shared with the US. Defence exports are one area of potential growth, though South Korean firms will have to compete in an era of reducing budgets.

The 2012 defence budget amounted to US$29bn or 14.8% of the central government budget and 2.5% of GDP. There is a growing consensus that defence spending should increase to at least 2.7% of GDP. The ‘Mid-Term Defense Plan 2013–17’ called for increased spending on capabilities including surface-to-surface missiles, standoff precision-guided weapons and airborne electronic-attack systems. However, additional outlays will be constrained by annual growth rates that, due to the country’s maturing economy, will likely
hover around 2–3%, as well as by calls for increased social-welfare spending by presidential election candidates.

*IHS Jane’s Defence Weekly* described the 2016 budget as follows:80

South Korea's National Assembly approved on 3 December a 2016 defence budget of KRW38.8 trillion (USD33.5 billion), representing a decrease against the expenditure earlier requested by the Ministry of National Defense (MND).

According to the MND, the approved expenditure represents a 3.6% increase against actual spending in 2015. However, it is less than the KRW40.1 trillion initially requested by the MND, which was later trimmed to KRW38.9 trillion. The approved defence budget also amounts to 10% of the total government expenditure for 2016 and nearly 2.5% of GDP.

The MND said in a statement to *IHS Jane's* that the approved 2016 budget encompasses a 2.7% increase in operating and personnel expenses to KRW27.16 trillion, and KRW11.64 trillion for defence modernization, an increase of 5.7%.

**Figure VI.20: ROK Defense Budget and Annual Growth, 2006-2015**

Japanese Estimate in 2015

Figure VI.21: The ROK 2016 Defense Budget (KRW Billions)

Spending: 2009-2016

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<tr>
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<tbody>
<tr>
<td>GDP</td>
<td>1,065,037</td>
<td>1,173,275</td>
<td>1,237,128</td>
<td>1,308,642</td>
<td>1,399,078</td>
<td>1,413,978</td>
<td>1,544,900</td>
<td>1,610,200</td>
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<tr>
<td>Defense Budget (Billion $)</td>
<td>28,980 ($22.3)</td>
<td>29,563 ($25.7)</td>
<td>31,403 ($27.3)</td>
<td>32,958 ($30.8)</td>
<td>34,345 ($30.4)</td>
<td>35,706 ($31.9)</td>
<td>37,456 ($36.4)</td>
<td>38,800 ($34.0)</td>
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<tr>
<td>YoY Increase %</td>
<td>8.7</td>
<td>2</td>
<td>6.2</td>
<td>5</td>
<td>4.2</td>
<td>3.5</td>
<td>4.9</td>
<td>3.6</td>
</tr>
<tr>
<td>As % of GDP</td>
<td>2.72</td>
<td>2.52</td>
<td>2.54</td>
<td>2.52</td>
<td>2.45</td>
<td>2.53</td>
<td>2.42</td>
<td>2.41</td>
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Break Out of Spending by Category

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<tr>
<th>Classification</th>
<th>2016 Spending</th>
<th>Share (%)</th>
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<tbody>
<tr>
<td>Defense Budget</td>
<td>38,799.50</td>
<td>100</td>
</tr>
<tr>
<td>* Force Improvement Program</td>
<td>11,639.80</td>
<td>30</td>
</tr>
<tr>
<td>* Force Maintenance</td>
<td>27,159.70</td>
<td>70</td>
</tr>
<tr>
<td>- Personnel Expense</td>
<td>14,271.60</td>
<td>36.8</td>
</tr>
<tr>
<td>- Food &amp; Clothing</td>
<td>2,135.10</td>
<td>5.5</td>
</tr>
<tr>
<td>- Defense Informatization</td>
<td>525.3</td>
<td>1.4</td>
</tr>
<tr>
<td>- Service Members Welfare</td>
<td>266.5</td>
<td>0.7</td>
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<tr>
<td>- Logistics Support</td>
<td>4,602.10</td>
<td>11.9</td>
</tr>
<tr>
<td>- Training &amp; Education</td>
<td>532.6</td>
<td>1.4</td>
</tr>
<tr>
<td>- Installation Construction</td>
<td>2,656.70</td>
<td>6.8</td>
</tr>
<tr>
<td>- Others</td>
<td>2,169.80</td>
<td>5.6</td>
</tr>
</tbody>
</table>

1 CIA, *World Factbook*, “North Korea” and “South Korea.” GDP measured in purchasing power parity terms.


Increase/decrease is for the 2007-2011 period, while the amount and share are for the 2006-2011 period.

With “other” included, the total of shares would equal 100%.

Equipment maintenance, equipment/materials procurement, fuel/ammunition, transportation/disaster management, ammunition management.

Defense cost sharing, dispatch of troops out of the country, and military attaches’ activities.

The high increase in the amount of defense-related administrative support is due to the reflection of compensation concerning military plane-caused noise in residential areas (120 billion won).


CIA, World Factbook, “North Korea” and “South Korea.”

Ibid.

Ibid.

IISS, Military Balance 2014, 204.


Ibid.


Ibid.


Ibid.

Ibid.

Ibid.
70 Ibid.


72 CIA, World Factbook, “North Korea” and “South Korea.”

73 CIA, World Factbook, “South Korea.”


77 Ibid.

78 Ibid., 2-4.
