



North Korea's Missile Supply Relationship With Iran and Syria: Lessons for Policy

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1st Asan Plenum
Seoul, June 13, 2011

Summary

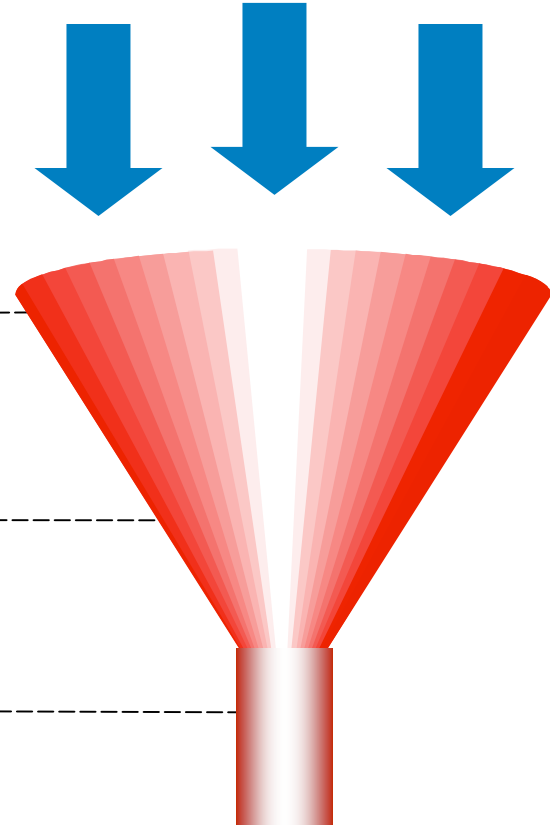
- Today, North Korea (DPRK) is the single most important supplier of ballistic missile technology to Iran and Syria
- Ties to Burma (Myanmar) are also suspected
- But in the 1980s and 1990s, the DPRK supplied at least seven states
- North Korea's foreign missile ties are now more exclusive and collaborative
- These changes were partly in response to attempts to curtail the global missile trade
- Enough time has passed to judge the effectiveness of these policy measures

Outline

- DPRK missile trade as a funnel
- Policy measures against missile proliferation
- What could make policy measures more effective?

DPRK Missile Trade as a Funnel

- Acquisition
 - Technology from multiple sources
- Exports (sales or barters)
 - At least seven customers
- Technology transfer
 - At least five customers
- Joint development
 - Iran and Syria only



Acquisition (1)

North Korea is not self-sufficient

- The DPRK acquired missile technology of Soviet origin starting in the 1970s
 - Chinese, Egyptian, and Russian specialists seem to have been involved at different times in North Korea's missile pursuits
- Dual-use tools, parts, and materials of Japanese, Chinese, and other foreign origins have been crucial
 - The Korean Association of Science and Technology of the Chongryon (in Japan) appears to have played an especially important role in acquisition

Acquisition (2)

Defector testimony

- Defector testimony emphasizes the importance of Japanese tools and parts
 - “[A defector] says the vast majority of the computer chips and electronic components used in missile guidance systems there were Japanese. He recalls unloading a shipment of equipment from Japan that was like a Christmas stocking for missile scientists, packed with oscilloscopes for analyzing trajectory, special welding machines to make the seamless joints needed in a missile body, computer chips and picture tubes used in monitors to track missile routes. ‘Without foreign parts we couldn't have made the missiles...’”

Source: John Larkin and Donald MacIntyre, “Arsenal of the Axis,” *Time*, July 7, 2003

Acquisition (3)

Seized evidence

- Evidence from seized cargo indicates Japanese and Chinese suppliers
 - “A striking feature of the cargo was the high proportion of foreign-made parts and machines, many of which still bore country-of-origin markings from Japan or China...”
- And Russian and Chinese technical heritage
 - “The documents were filled with a unique kind of technical jargon invented by North Korean scientists to replace scientific terms in Russian or Chinese.”

Source: Joby Warrick, “On North Korean Freighter, a Hidden Missile Factory,” *Washington Post*, August 14, 2003

Ballistic Missile Exports

Over 80% of known DPRK missile deliveries occurred prior to 1994

- The U.S. Congressional Research Service (CRS) releases an annual report on arms transfers to developing nations
- Comparing versions makes it possible to reconstruct missile deliveries approximately

Period	1987 - 1993	1994 - 2000	2001 - 2009	Totals
From Russia	350	40	10	400
From China	270	-	-	270
From North Korea	420	30	60	510
Totals	1,040	70	70	1,180

Technology Transfer (1)

Metastasis

- “North Korea’s missile trade is like a localized cancer that starts to spread. First you see the missile sales, but then it spreads to services and production technology and becomes harder and harder to track.”
 - Anonymous U.S. official, 1996

Source: Wisconsin Project on Nuclear Arms Control, “North Korean Missile Exports,” *Risk Report*, No. 2, November/December 1996

Technology Transfer (2)

Missile deliveries gave way to local manufacturing in the 1990s

- Details of seized shipments can be found in news reports and official documents
- 1994 to 2000 had the fewest DPRK missile deliveries (30 out of 510) and the most seized shipments of manufacturing equipment or parts

Period	1981 - 1993	1994 - 2000	2001 - 2010
Complete missiles from DPRK	-	-	1
Missile manufacturing equipment or parts from DPRK	1	7	2
All other arms from DPRK	1	3	7
Totals	2	10	10

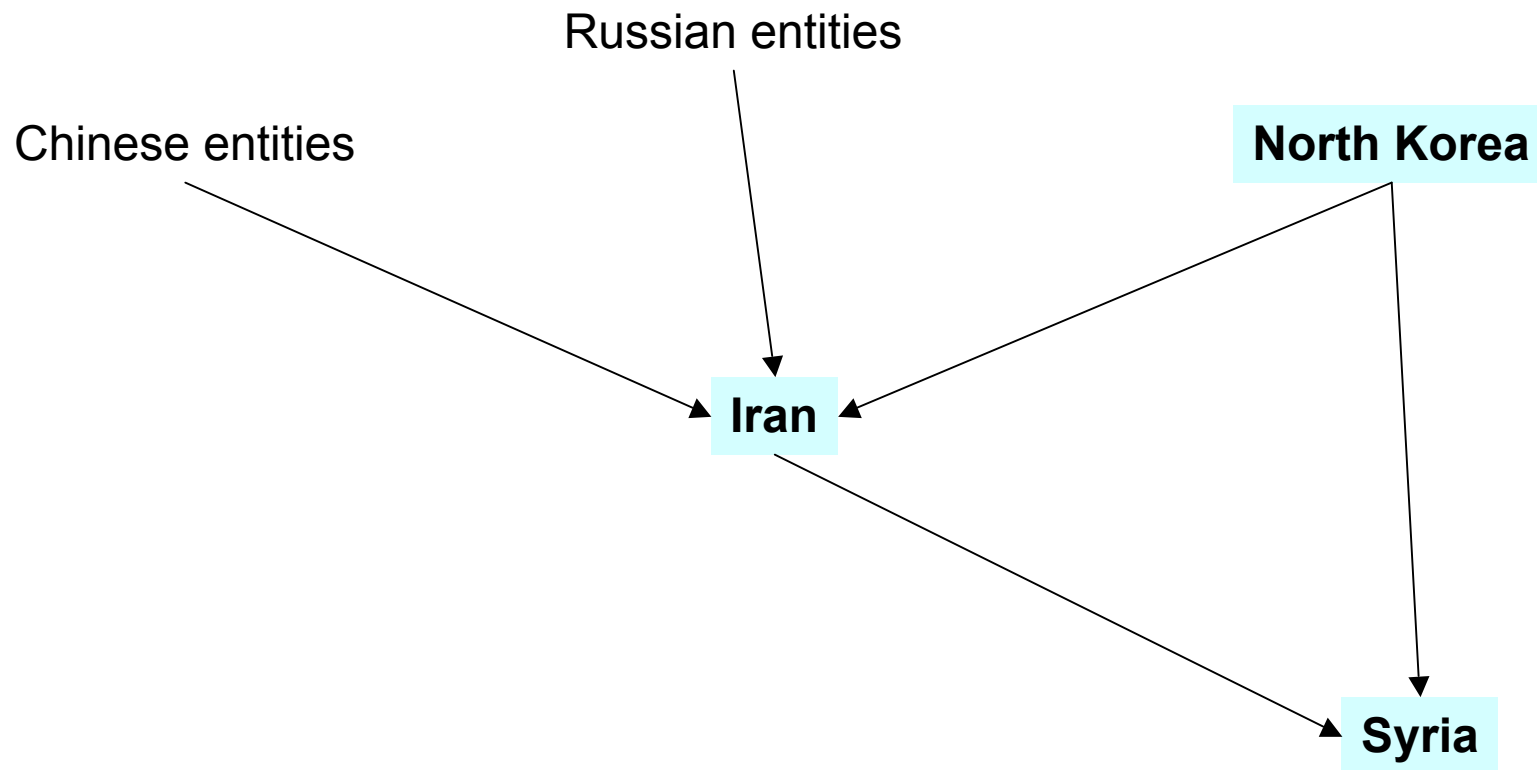
Joint Development (1)

Claims of the U.S. intelligence community

- According to the latest edition of an annual report of the U.S. intelligence community to Congress:
 - Iran is moving toward “self-sufficiency in the production of ballistic missiles” but “almost certainly remains dependent on foreign suppliers”
 - “Entities in China and Russia along with North Korea”
 - Syria is “developing” its own Scud variants “with assistance from North Korea and Iran”

Joint Development (2)

Claims of the U.S. intelligence community (as a diagram)



Joint Development (3)

Other perspectives

- According to the UN's Panel of Experts on North Korea:
 - The DPRK allegedly “employs various techniques” in collaborating with other countries in missile development, “including exchange of visits by scientists and technicians, exchange of data, reciprocal participation in tests and analysis of results.”
 - The October 10, 2010 military parade in Pyongyang featured a new re-entry vehicle for the Nodong missile, very similar to “the Iranian Shahab-3 triconic warhead.”
- From a January 2009 interview with President Bashar al-Assad of Syria:
 - Q: Do you work closely together with countries like North Korea and Iran as part of these weapons programs?
 - A: We work trustingly together with many countries on research programs.

Sources: Panel of Experts, “Report of the Panel of Experts established pursuant to resolution 1874 (2009),” May 2011
“SPIEGEL Interview with Syrian President Bashar Assad: 'Peace without Syria Is Unthinkable,’” *Der Spiegel*, January 19, 2009

The Narrowing Funnel

From exports to technology transfer to joint development

- Exports
 - Published sources describe DPRK missile exports to Iran, Syria, Egypt, Pakistan, Libya, United Arab Emirates, and Yemen (seven states)
- Technology transfer
 - Manufacturing equipment or parts from the DPRK have been found headed for Syria, Egypt, Pakistan, Libya, an unnamed Middle Eastern state (Syria or Iran?), and possibly also Burma (five or six states)
- Joint development
 - Iran and Syria are described as having developed large, increasingly sophisticated ballistic missile arsenals in cooperation with the DPRK (two states)

Policy Measures against Missile Proliferation

- Since the 1980s, four major policies have been undertaken against missile proliferation
 - Export-control diplomacy
 - Sanctions and interdiction
 - Pressure on buyers
 - Ballistic missile defense development
- Enough time has passed to judge the effectiveness of these policy measures
 - In some cases, policy measures have had multiple objectives
 - The following judgments concern only the effects of policy measures on missile proliferation

Export-Control Diplomacy

Partly effective in reducing supply

- The Missile Technology Control Regime (MTCR) and related bilateral diplomacy have helped to limit the spread of highly sophisticated Russian and Chinese ballistic missiles
 - But some Russian and Chinese “entities” are still cited as suppliers to the Iranian missile program
- Israel-DPRK and U.S.-DPRK missile talks in the 1990s were inconclusive
- North Korea has had extensive access to dual-use components in Japan, China, and elsewhere
 - Japan started to crack down in 2005

Sanctions and Interdiction

Not effective in reducing supply

- The Proliferation Security Initiative (PSI) of 2003 has had no observable influence on the missile trade
- Interdictions under PSI, UNSCR 1718 (2006), and UNSCR 1874 (2009) have mostly resulted in the seizure of conventional weapons shipments
- The DPRK has adapted to the threat of interdiction
 - According to the UN's Panel of Experts, air transit is increasingly important

Pressure on Buyers

Partly effective in reducing demand

- Egypt(?), Pakistan(?), Libya, United Arab Emirates, and Yemen appear to have discontinued DPRK missile ties
- The U.S. openly pressured Yemen to discontinue trade with DRPK after the Spanish Navy stopped a Scud delivery at sea in December 2002
- Egypt, Pakistan, and United Arab Emirates enjoy access to high-tech Western weapons, which may create incentives not to deal with the DPRK
- But pressure has had no effect on Iran or Syria

Ballistic Missile Defenses

Counterproductive in reducing demand

- According to the U.S. *Ballistic Missile Defense Review Report* (2010), Iran, Syria, and North Korea are now amassing increasingly large and sophisticated ballistic missile arsenals
 - “Proliferators are increasing the number of deployed systems (and thus raid sizes), shifting from liquid- to solid-fueled systems, and deploying missile defense countermeasures.”
- Ballistic missile defense has helped to stimulate these developments

From the *Ballistic Missile Defense Review Report* (2010)

Salvo launch as a means to defeat BMD



IRANIAN SALVO LAUNCH. The technique of launching missiles in salvos (shown here during an Iranian exercise in 2006) demonstrates interest and capability in defeating missile defenses, thereby increasing the likelihood of a missile reaching its target. Two years later Iran would make world headlines by doctoring a photo of a different salvo launch during a follow-on exercise, but that should not be construed as an inability to conduct such launches.

Source: U.S. Department of Defense, *Ballistic Missile Defense Review (BMDR) Report*, February 1, 2010

What the Iranians are Saying

New missiles exhibit BMD countermeasures

- In August 2010, Iran announced a new Scud variant designed to evade interception
 - According to Iran's Defense Minister, the Qiam-1 has “a smart navigation system” and no fins, which suggests boost-phase countermeasures



What Could Make Policy More Effective?

- Limited Chinese participation has weakened efforts to stop missile proliferation (and weapons of mass destruction proliferation)
 - Poor enforcement of dual-use export controls
 - Few controls over transit of DPRK shipments through Chinese seaports, airspace
 - Technology transfers from more advanced countries could have implications for BMD countermeasures
 - Chinese, Russian “entities” tied to Iranian missile program
 - On May 24, 2011, the U.S. Department of State named one Chinese individual and three firms as involved in WMD or missile proliferation related to Iran, Syria, or North Korea
- But the DRPK is adaptable, and might be able to adjust to a tougher Chinese stance over time

Thank you!



Reasons that Future DPRK Nuclear Exports will be Exclusive

- It's a risky business; trust matters
- DPRK's known nuclear exports have involved its established partners in the missile trade
 - Syria, ca. 1997-2007, Magnox reactor (sale)
 - Pakistan, late 1990s, Krytron tech. (barter)
 - Libya, 2000 and 2001, UF6 via Pakistan (sale)
- Known nuclear exports started during the “arduous march,” a desperate time
- A barter with Iran could be attractive
 - DPRK has more advanced centrifuges
 - Iran has more advanced solid-fueled ballistic missiles and cruise missiles

Reasons that Future DPRK Nuclear Exports will be Broad

- Arab states feel threatened by Iran's nuclear capabilities, less sure of American support
 - Saudi Arabia, Jordan (and Vietnam!) are reluctant to forswear enrichment technology
- Starting in 2009, G-8 members have pledged not to spread enrichment or reprocessing technology...
 - ...but the DPRK has a centrifuge enrichment capability more advanced than Iran's
- DPRK needs cash
 - Kim Jong-il allegedly told senior Korean Workers Party officials in 2010 that he would judge their loyalty based on how much hard currency they brought in