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NUCLEAR LEVERAGE

US Intervention in Sensitive Technology Transfers in the 1970s

Peter Tzeng

Most observers would surmise that the United States applies significant pressure on certain states behind closed doors to deal with nuclear proliferation threats. While information about such pressures today remains classified, information about similar pressures in the 1970s has become available via the Freedom of Information Act. This article draws on hundreds of unpublished, declassified government documents from multiple archives to recount how the United States intervened in sensitive technology transfers to Brazil, South Korea, and Pakistan in the 1970s. In each case, US officials employed concrete sources of leverage to pressure states to cancel their nuclear arrangements. Notably, however, the United States today no longer possesses the leverage it used in the 1970s to deliver pressure. In particular, US nuclear leverage—nuclear technology, nuclear financing, and nuclear fuel—has diminished significantly over the past three decades. Policy makers in Washington therefore must ask themselves: to what extent has this loss of leverage weakened the ability of the United States to deal with nuclear proliferation threats today?

KEYWORDS: Nuclear nonproliferation; export controls; technology transfer; Brazil; Pakistan; South Korea

When the nuclear nonproliferation regime fails to address certain proliferation threats, the United States has not shied away from taking unilateral action. Sometimes this action is open to public scrutiny (such as presidential initiatives and sanctions legislation). Other times this action is hidden from the public eye. Some today speculate that behind closed doors, Washington employs a variety of pressure tactics—as extreme as cyber-attacks and assassinations—to deal with nuclear proliferation threats. Although information about such pressure tactics today is classified, information about US pressure tactics in the 1970s has become available.

During the few years following India's "peaceful nuclear explosion" in 1974, Brazil, Pakistan, and South Korea all aimed to acquire sensitive technologies from either France or West Germany for purposes that were not purely peaceful. The nonproliferation literature concurs that the United States intervened in all three cases, privately delivering pressure on both the suppliers and the recipients to terminate the transactions (see [Table 1](#)).¹ Nevertheless, the literature is incomplete on the details of the pressure that the United States brought to bear.

TABLE 1
Summary of US interventions.

Supplier	Recipient	Sensitive Technology Transfer	Deal Signed	NCA Signed	Start of US Intervention	Cancellation of Deal
West Germany	Brazil	Enrichment, Reprocessing	February 1975	June 1975	February 1975	—
France	South Korea	Reprocessing	April 1975	October 1974	June 1975	January 1976
France	Pakistan	Reprocessing	October 1974	March 1976	Late 1974	May 1978

Note: “Deal” refers to the commercial contract of the transfer, whereas the “NCA” (nuclear cooperation agreement) refers to the treaty between the governments of the supplying and receiving states to permit the transfer.

For decades, government files on these three cases have been classified. But in recent years, the personal archives of top officials in the State Department and other executive branch agencies from the 1970s have been disclosed via the Freedom of Information Act. This article draws on interviews, congressional records, newspaper archives, and most importantly hundreds of unpublished, declassified government documents from multiple archives to recount how the United States delivered pressure to address these three proliferation threats. The article then examines the specific sources of leverage the United States used to deliver pressure, and ends with a discussion on the implications of the lack of much of this leverage today.

Brazil

On February 12, 1975, Bonn and Brasilia concluded an agreement for the transfer of the entire nuclear fuel cycle from West Germany to Brazil: uranium exploration and mining, jet nozzle enrichment, fuel fabrication, power reactors, and reprocessing.² The agreement was the largest nuclear deal in history, and was worth approximately \$8 billion over ten to fifteen years.³ The Brazilians purportedly pursued the deal for the sole purpose of enhancing their energy security, while the West Germans were attracted by the large commercial prospects. At the time, neither state was party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), but West Germany had declared that it would abide by the Treaty and thus would require trilateral safeguards with the International Atomic Energy Agency (IAEA) for the nuclear exports.⁴

US officials learned of the agreement a week after it was concluded.⁵ Concerned with the proliferation of sensitive technologies, Washington immediately appealed to Bonn to cancel the export and sent a four-member delegation to push for cancellation on April 7.⁶ The Americans further raised the issue at the NPT Review Conference that May.⁷ The Germans, however, were not responsive, not least because US disapproval was only voiced through middle-ranking officials.⁸ Moreover, the Germans thought US

objections stemmed from business interests rather than genuine nonproliferation concerns.⁹

At the NPT Review Conference, a member of the US delegation leaked information about the deal and US pressures to stop it to two congressional staff members.¹⁰ The news reached Congress, and on June 3, several members of the Joint Committee on Atomic Energy sharply criticized the deal on the Senate floor.¹¹ They called for US intervention in Bonn "at the highest levels of international diplomacy."¹²

After the Congressional outcry, Secretary of State Henry Kissinger entered the picture. He decided not to seek cancellation of the deal because he recognized that public knowledge of US pressures meant that it would be politically difficult for the Germans and Brazilians to cancel.¹³ Instead, he sought stringent safeguards beyond those required by the NPT.¹⁴ By late June, after further appeals by Washington, the Germans had agreed to include technology safeguards in the forthcoming trilateral safeguards agreement.¹⁵ Shortly after, on June 27, Bonn and Brasilia signed a nuclear cooperation agreement to permit the transaction. Nevertheless, in September, Bonn was still consulting with Washington over the safeguards agreement, and in the end, both Bonn and Brasilia accepted US suggestions that made the safeguards agreement the most stringent that had ever been signed with a non-NPT state.¹⁶ The agreement included strict technology safeguards and required Brazil to obtain German approval for re-exporting technologies and making future "pertinent agreements" with other states.¹⁷ In addition, Bonn established joint management schemes that gave it a veto over Brazilian enrichment and reprocessing activities.¹⁸ The IAEA Board of Governors approved the safeguards agreement on February 26, 1976.

Tacit US approval of the deal ended, however, when the Jimmy Carter administration entered office in January 1977. President Carter made a renewed effort to stop the sensitive transfers at the highest levels of government.¹⁹ By the time of Carter's inauguration, Secretary of State-designate Cyrus Vance had already informed West Germany's Secretary of State Peter Hermes that Washington opposed the sensitive technology transfers. A few days after the inauguration, Vice President Walter Mondale criticized the deal publicly in Brussels and then privately to Chancellor Helmut Schmidt in Bonn. Two weeks later, Deputy Secretary of State Warren Christopher was in Bonn pushing Schmidt to cancel.²⁰ The administration also approached Brazil: on January 27, Secretary Vance wrote to the Brazilian government proposing a postponement of the deal, though Brasilia rejected the proposal a few days later.²¹

The Carter administration had multiple sources of leverage over West Germany and Brazil. Bonn depended on Washington for military support and supplies of uranium and plutonium for research. Brasilia's nuclear program, launched with US support under the 1953 "Atoms for Peace" program, depended on the United States for nuclear fuel.²² Nevertheless, Washington chose to avoid delivering threats and violating nuclear fuel contracts to achieve its goals. Instead, by February 1977, US officials had put forth a set of positive incentives to Brazil, some of which had been discussed under the Gerald Ford administration, in exchange for canceling some of the nuclear deal's most sensitive elements.

First, US officials offered to guarantee the supply of nuclear fuel to the German power reactors to be built in Brazil, as it was unclear whether URENCO, the Dutch-Anglo consortium, would supply the fuel as planned.²³ To strengthen this offer, the Americans went so far as to approach URENCO officials in The Hague in April 1977 to seek an "indefinite delay" on the delivery of URENCO enriched uranium.²⁴ Second, Washington offered to set up a multilateral arrangement for enrichment or reprocessing in the region.²⁵ Various State Department officials and Brazilian Ambassador João Batista Pinheiro supported this approach, even though Secretary Kissinger had had "serious doubts" about it.²⁶ Third, in response to accusations that business interests were behind US efforts to foil the deal, Washington offered to prevent any US firms from competing for any of the remaining six nuclear reactors envisioned in the German-Brazilian agreement.²⁷ Nevertheless, despite these three offers, the Brazilians were unwilling to relinquish the sensitive technologies.

Consequently, the Carter administration began targeting German export licenses.²⁸ The applications for the pilot enrichment and reprocessing plant export licenses had been received in June and October 1976, respectively, but Washington convinced Bonn to delay their approval.²⁹ On February 3, 1977, President Carter himself spoke to Chancellor Schmidt over the phone about extending the postponement.³⁰ Chancellor Schmidt acquiesced, but pressed Washington to find a solution acceptable to Brazil. Since such a solution ultimately was not found, on April 5, Bonn finally issued the export licenses for the sensitive facilities.³¹ Despite the West Germans' unwillingness to cancel the sensitive transfers, they made other nonproliferation assurances to appease Washington. On June 17, 1977, Bonn announced that, after the transaction with Brazil, it would no longer export reprocessing plants, confirming that the deal would not become a precedent.³²

In July 1977, Argentina's attempt to acquire an unsafeguarded reprocessing plant rekindled fears in Washington that Brazil would pursue a bomb. Consequently, President Carter's Special Representative for Nonproliferation Gerard Smith went to Bonn in a renewed effort to "sanitize" the nuclear deal, and a parallel approach was made to Brasilia.³³ These final efforts, however, were unsuccessful. In December 1977, the first power reactor shipment left from West Germany to Brazil, and construction began on the pilot enrichment plant in Brazil.³⁴

Ultimately, what prevented the full implementation of the deal was not foreign intervention, but rather a combination of economic problems, technical obstacles, huge cost overruns, and domestic pressures. By 1985, the jet nozzle enrichment technology was determined to be impractical, the reprocessing project had been indefinitely postponed, and six of the eight planned power reactors had been cancelled.³⁵

South Korea

Negotiations between South Korea and France over a pilot reprocessing facility began as early as 1972.³⁶ In October 1974, Seoul and Paris signed a nuclear cooperation agreement to permit the transfer, and on April 12, 1975 the Korea Atomic Energy Research Institute (KAERI) and the French firm Saint-Gobain Techniques Nouvelles (SGN) reached an agreement for the reprocessing facility.³⁷ Seoul purportedly pursued the facility solely

out of energy concerns, while the French concluded the deal for commercial reasons: although the reprocessing facility was worth a mere \$20 million, there was an understanding that the deal's fulfillment would facilitate the French sale of two power reactors valued at \$1 billion.³⁸ France had not signed the NPT and South Korea had not yet ratified the treaty, but France—in light of its 1968 declaration to behave as an NPT state—would require trilateral safeguards with the IAEA.³⁹ In any case, Seoul would ratify the NPT on April 23, 1975 and conclude a comprehensive safeguards agreement with the IAEA on October 31, 1975.⁴⁰

US concerns with Seoul's nuclear program started before the revelation of the reprocessing deal. In early 1975, Washington worked with Ottawa to pressure South Korea to ratify the NPT. At the time, Seoul had requested that the United States Export-Import Bank (Ex-Im Bank) provide \$249 million in loans and guarantees for a second Westinghouse power reactor (Kori-2), and that Ottawa make a similar loan for a Canadian power reactor (Wolseong-1).⁴¹ To ratchet pressure on Seoul, the US Senate Banking Committee blocked Ex-Im Bank financing for Kori-2, while Ottawa blocked its loan agreement for Wolseong-1. Shortly after Seoul's ratification of the NPT in April 1975, the Ex-Im Bank bill for Kori-2 financing was submitted to Congress, and Ottawa agreed to provide \$300 million in loans for Wolseong-1.⁴²

In early June 1975, Seoul publicly announced the reprocessing deal with France. At the time, South Korea's Ex-Im Bank financing request for Kori-2 was still before Congress. As a result of the announcement, Congress sought extra assurances that US financing would not support a state developing nuclear weapons. Ultimately, Congress and the Ex-Im Bank agreed that they would postpone hearings on the loan until the State Department could assure them that the proliferation risks of the reprocessing plant were negligible.⁴³

In order to provide such an assurance, senior officials in the State Department concluded that they needed to intervene and seek cancellation of the reprocessing contract. Washington first appealed to Paris, but the French refused to cancel in light of political and reputation concerns. Paris agreed, however, not to object to a US request that Seoul cancel the deal as long as SGN was reimbursed for termination costs (a few million dollars).⁴⁴ The French furthermore agreed to include technology safeguards in the trilateral safeguards agreement with South Korea.⁴⁵

Not yet willing to push the Koreans to cancel the reprocessing arrangement, Washington next sought control over spent fuel in South Korea. First, US officials convinced Ottawa to negotiate a veto right over the reprocessing of spent fuel from Wolseong-1. Then, Washington decided not to supply contracted fuel to South Korea's first Westinghouse power reactor (Kori-1) until Seoul "confirmed" that the US-Korean bilateral nuclear cooperation agreement gave the United States an effective veto over the reprocessing of spent fuel produced from US-supplied reactors.⁴⁶ The cooperation agreement, however, only explicitly gave Washington a veto right over the reprocessing of US-origin spent fuel in South Korea.⁴⁷ Seoul eventually confirmed the US interpretation, and Washington delivered the contracted fuel for Kori-1, albeit two months late.⁴⁸ These controls over spent fuel, however, did not settle US qualms.

On July 2, Deputy Secretary of State Robert S. Ingersoll wrote to Secretary Kissinger with the recommendation that Washington formally ask Seoul to cancel the reprocessing deal. He proposed to inform Seoul that the reprocessing deal could jeopardize US nuclear assistance, in particular the Ex-Im Bank credits for Kori-2.⁴⁹ Kissinger, however, did not wish to apply "undue pressure on an already uncertain ally," and so refused to authorize such action.⁵⁰ But on August 7, Assistant Secretary of State Philip C. Habib, Director of the Bureau of Political-Military Affairs George S. Vest, and Director of Policy Planning Winston Lord wrote to Secretary Kissinger in support of Ingersoll's approach. They added that Washington should use future bilateral nuclear cooperation as leverage to pressure the Koreans to cancel. Ultimately, Secretary Kissinger accepted their proposal. That month, Washington formally asked Seoul to cancel the French reprocessing contract, in exchange for an expansion of US nuclear exports and financial assistance to their nuclear program.⁵¹

Nevertheless, contrary to US predictions, Seoul refused. On September 22, France, South Korea, and the IAEA signed the safeguards agreement for the reprocessing facility.⁵² After Seoul's initial refusal, US officials began to vigorously push for Korean cancellation: the issue was brought up in meetings between US Ambassador Richard L. Sneider and the Korean deputy prime minister, as well as between Ingersoll and Korean Ambassador Pyong Choon Hahm.⁵³ On October 23, Acting Foreign Minister Lho Shin Young informed Ambassador Sneider that Seoul would not cancel the contract, but would be willing to accept US inspections on top of IAEA safeguards.⁵⁴

By November, the Canadians had obtained a veto right over Korean reprocessing of spent fuel from Canadian reactors, relieving some US concerns. But soon after, Washington learned that the French planned to sell two power reactors to South Korea, providing an alternate source of spent fuel for the reprocessing facility. In the eyes of Washington officials, the French nuclear reactor sales were problematic for two further reasons. First, they would give the French a stronger incentive to deliver on the reprocessing deal. Second, they could displace projected US sales of more power reactors to Korea in the long run.⁵⁵

After several more unsuccessful approaches to the Koreans, on November 18, Secretary Kissinger, at the recommendation of Habib and Lord, decided to strengthen US pressure on Seoul to cancel the contract. He aimed to work in concert with the Canadians and exploit the leverage that both Washington and Ottawa had over South Korea's nuclear program: reactor sales, reactor credits, and reprocessing vetoes.⁵⁶ He also informed the French of these new efforts and revealed to them Washington's "firm conclusion" that Seoul had embarked on a covert nuclear weapons program.⁵⁷

Throughout December, Washington made a series of high-level representations to the South Koreans, approaching both Prime Minister Kim Jong Pil and President Park Chung Hee.⁵⁸ The US officials explained to Seoul the importance of the cancellation for their overall bilateral relationship and stability in the region.⁵⁹ They furthermore presented a series of offers to Seoul if the Koreans cancelled. They would increase US supply of non-sensitive nuclear technology to Korea, increase US training opportunities for Korean nuclear scientists, increase enrichment and reprocessing services to Korea, and support a multilateral arrangement for reprocessing in the region. At the same time, they also presented a series of consequences if Seoul did not cancel. On the nuclear end, they

would withdraw the Ex-Im Bank request to Congress for \$249 million in loans and guarantees for Kori-2, withhold the export licenses for Kori-2, and veto South Korean reprocessing of US-origin spent fuel.⁶⁰ They would also consider terminating military aid and arms sales to South Korea. Ottawa added to this pressure by threatening to withhold the sale of Wolseong-1.⁶¹

In light of these threats and offers, Seoul finally cancelled the contract in late January 1976. On January 29, Acting Assistant Secretary of State Myron B. Kratzer revealed at a Senate Government Operations Committee hearing that Seoul had “reached the decision that the cancellation of its plans was in its own best interests.”⁶²

Although Korean officials were upset at the loss of the transaction, US officials followed through on their offers, and the South Korean nuclear power program flourished. Soon after Seoul cancelled the contract, it announced that it had finally reached an agreement with Ottawa for the sale of Wolseong-1, which had been under discussion since November 1973.⁶³ More importantly, as Washington had unofficially promised, nuclear cooperation between the United States and South Korea expanded. Not only did the \$249 million worth of Ex-Im Bank credits for Kori-2 go through, but over the following years, Westinghouse provided four additional power reactors to South Korea, accompanied by \$995 million in US Ex-Im Bank credits.⁶⁴

Pakistan

In 1973, Islamabad began negotiations with SGN and French government officials for the construction of a large-scale reprocessing facility at Chashma for the purpose of building a nuclear weapon.⁶⁵ SGN and Islamabad signed the “basic design” contract for the facility in 1973 or 1974, and the “detailed design” contract on October 18, 1974.⁶⁶ The deal was valued at approximately \$55 million: \$10 million for SGN, and \$45 million for French subcontractors.⁶⁷ In addition, Pakistan promised that the deal would lead France to the multibillion dollar sale of three or four power reactors at Chashma, a fuel fabrication facility, and civil and military aircraft.⁶⁸ Although neither state had signed the NPT, France once again required trilateral safeguards with the IAEA.

In late 1974, Washington learned of the transfer and immediately pressed Paris to cancel the arrangement.⁶⁹ Paris refused, but agreed to include technology safeguards and strict retransfer provisions in the trilateral safeguards agreement, which it signed on March 18, 1976. Soon after, US pressures on France to cancel the deal merged with Washington’s greater efforts to institute a universal suspension of reprocessing technology exports. At the Nuclear Suppliers Group meeting in June 1976, the US delegation officially called for an eighteen-month reprocessing export moratorium, but Paris only agreed to have consultations before undertaking new reprocessing exports, noting that the Pakistani deal would not be subject to these consultations.⁷⁰ Prime Minister Jacques Chirac was personally committed to the contract, asserting that the deal was “an agreement between France and Pakistan and not subject to third-party interference.”⁷¹

US leverage over the Pakistanis was more concrete. On the economic end, the United States had provided \$829 million in aid commitments to Pakistan for economic recovery since the 1971 Indo-Pakistani War.⁷² On the military end, as early as September

1975, Islamabad had pressed Washington for the sale of and military credits for 110 advanced A-7 military aircraft to defend against a potential Indian attack.⁷³ Nevertheless, National Security Decision Memorandum 289 (NSDM 289) prohibited offensive arms sales, arms sales that would spark an arms race, and military aid (loans and grants) to Pakistan.⁷⁴ The initial US position was that the A-7 planes were offensive in nature and would spark an arms race with India, and so US officials refused to sell them, let alone give credits for them.⁷⁵ Nevertheless, Washington began using both aid and arms sales to pressure Pakistan in two ways.

First, in June 1976, Congress passed the Symington Amendment, which prohibited US economic and military aid (except food aid) to any nation importing or exporting enrichment or reprocessing material, equipment, and technology, unless the recipient state accepted full-scope IAEA safeguards.⁷⁶ Since Pakistan had rejected such safeguards, all US non-food economic and military aid to Pakistan, which had totaled \$106.7 million in fiscal 1976, would be terminated if the French transferred any reprocessing equipment to Pakistan.⁷⁷

Second, on August 8, Secretary Kissinger traveled to Pakistan and presented an offer to Prime Minister Zulfikar Ali Bhutto. In exchange for cancellation of the reprocessing transaction, Kissinger would seek to modify NSDM 289, provide the requested 110 A-7 planes and some arms sales credits, and provide Ex-Im Bank financing for a French power reactor and fuel fabrication facility.⁷⁸ The offer of the A-7s won the support of the Pakistani air force, but Bhutto refused to give up the reprocessing deal.⁷⁹

From Pakistan, Kissinger flew directly to Paris but failed to convince the Chirac government to cancel the deal. The French position changed, however, after Chirac resigned from office on August 25. President Valéry Giscard d'Estaing took control over French nuclear export policy, and began heeding the US concerns after a meeting with Kissinger in early September.⁸⁰ On October 11, Paris announced that it would prioritize nonproliferation concerns over commercial ones.⁸¹ Then on December 16, Paris announced that it would join a US moratorium on new reprocessing exports.⁸² Nevertheless, the French privately informed the Americans that they could not cancel the Pakistan contract for reputation and political reasons, unless given conclusive evidence that Pakistan was pursuing nuclear weapons.⁸³ The French also suggested that Washington convince Shah of Iran Mohammad Reza Pahlavi to pressure Islamabad to cancel the deal, but in the end, the Iranian pressure was ineffective.⁸⁴

Meanwhile, in a meeting with Pakistani Ambassador Sahabzada Yaqub Khan on September 11, Secretary Kissinger emphasized that if Jimmy Carter won the upcoming election, then the new administration "would like nothing better than to make a horrible example of somebody," potentially making all arms sales—not just of A-7s—impossible.⁸⁵ This warning was particularly significant at the time, as the State Department was going ahead with an \$80 million Pakistan arms sale notification to Congress and expected Congress to approve.⁸⁶ On December 17, after Carter won the election, Kissinger met with Ambassador Yaqub again and warned that the Carter administration would impose the Symington Amendment in such a way that would have a "draconian" effect on Pakistan.⁸⁷ Prime Minister Bhutto, however, maintained that, politically, he could not cancel the contract because he was planning on holding elections the following year before August,

and had relied on the reprocessing agreement to build domestic support.⁸⁸ Kissinger was respectful of these concerns, but recognizing that the Carter administration would take more drastic measures, he chose to find a middle ground.⁸⁹ By early January 1977, Kissinger had put together a second offer. In exchange for an "indefinite postponement" of the deal, he would provide a military package that included the A-7 aircraft, M-60 aircraft, Cobra helicopter gunships, and the necessary military credits, believing that Congress would acquiesce to such a package if Pakistan were to stop the reprocessing transaction.⁹⁰ In the nuclear realm, he would offer nuclear reactors, a fuel fabrication plant, and an assured supply of nuclear fuel.⁹¹ He would even guarantee a supply of nuclear fuel for the Canadian power reactor Kanupp-1, as the Canadians had cut off their supply.⁹² To top it off, Kissinger would provide Pakistan with a "generous" economic aid package.⁹³ Bhutto, however, was still unwilling to take action before the upcoming elections. On January 20, Secretary Kissinger left with the Ford administration, and took his offer with him.

When the Carter administration entered office, it first approached the French to cancel the deal. In the spring of 1977, Deputy Undersecretary of State Joseph Nye presented new evidence to the French on Pakistan's intent to use the Chashma facility for weapons purposes.⁹⁴ In response to this revelation, the French began delaying export licenses for shipments of sensitive technology to Pakistan. In particular, the French planned to not deliver the fuel-chopping machine, which they believed the Pakistanis could not easily find elsewhere.⁹⁵ The Carter administration simultaneously made an offer to Pakistan. Pending Congressional approval, it would provide the same nuclear financing and fuel supply that Kissinger offered, grant an additional \$100 to \$125 million in economic aid over two or three fiscal years, supply Pakistan with a "generous" food aid package, and hold more Pakistani currency to boost Pakistan's foreign exchange position.⁹⁶ The Carter package also included military sales of F-5 and A-4 aircraft, but unlike Kissinger, Carter administration officials stayed within the bounds of NSDM 289 and thus did not offer A-7s or military credits. As a result, when the Carter administration made the offer in June 1977, Islamabad emphatically rejected it.⁹⁷

In the end, Washington never reached an agreement with Bhutto. On July 5, the Pakistani military seized power through a bloodless coup d'état and placed Bhutto under arrest. General Zia-ul-Haq imposed martial law and continued with plans to acquire the reprocessing facility from France. Not only did he support Pakistan's nuclear weapon efforts, but he was also under domestic political pressure not to cancel the arrangement.⁹⁸

In August 1977, Congress passed the Glenn Amendment, which prohibited economic and military aid (except food aid) to any state importing or exporting a reprocessing facility after August 4, regardless of whether or not there were safeguards.⁹⁹ Then in September 1977, Washington suspended economic and military aid (except food aid) to Pakistan, under consideration of, but without formally invoking, the Glenn Amendment.¹⁰⁰

Meanwhile, the French had proposed the delivery of the more proliferation-proof co-processing technology in lieu of the reprocessing technology.¹⁰¹ In October 1977, the Pakistanis formally rejected France's offer, increasing French suspicions of Pakistani intentions to develop a nuclear weapon. As a result, French officials privately told US

officials that they would block the export licenses for the transfer of the remaining sensitive equipment.¹⁰² Nevertheless, the French would still not officially cancel for fear of “domestic repercussions” in France in light of legislative elections in March 1978. After the elections, however, France gave in. On May 29, 1978, Foreign Minister Louis de Guiringaud told Secretary Vance that President Giscard d’Estaing had decided to cancel the deal.¹⁰³ On August 23, Zia announced at a news conference in Rawalpindi that France had canceled the reprocessing agreement.¹⁰⁴

Immediately after Zia’s announcement in August 1978, US officials told Pakistan that they would lift the freeze on economic assistance and consider requests for military sales.¹⁰⁵ By August 25, two days after Zia’s announcement, the Carter administration had already asked Congress to approve \$122.4 million in economic aid to Pakistan for fiscal 1979, and was considering an additional \$80 million in food aid. On October 24, Washington formally announced the resumption of aid to Pakistan. Washington also offered to begin discussions on a bilateral nuclear cooperation agreement governing power reactor exports, and on requests for arms sales, including F-5s in limited numbers, but not including A-7s or military credits.¹⁰⁶ In November, the Carter administration offered the F-5s, but Islamabad rejected them and purchased Mirage 5 aircraft from the French instead.¹⁰⁷

Pressure and Leverage

In the three cases examined in this article, US pressures first materialized in the form of diplomatic appeals to the supplier states France and West Germany. These initial pressures led the suppliers to strengthen their safeguards agreements beyond NPT standards, but did not bring about the cancellation of the deals. US officials also made diplomatic appeals to relevant third parties, namely the Dutch in the Brazilian case, the Canadians in the Korean case, and the Iranians in the Pakistani case, but these efforts also did not achieve the intended results. As a result, the Americans turned to concrete sources of leverage to deliver pressure on the recipient states. This leverage included nuclear leverage—nuclear technology, nuclear financing, and nuclear fuel—as well as foreign aid and arms sales. Application of these various sources of leverage came in the form of offers (positive leverage) and threats (negative leverage).

Nuclear Technology Leverage

US firms undoubtedly possessed the most advanced nuclear technology in the 1970s. Historically speaking, the success of the nonproliferation regime had relied on this leverage: states accepted safeguards and other nonproliferation controls in exchange for the potential to acquire advanced US nuclear technology. Brazil, South Korea, and Pakistan were not exceptions. All three states signed nuclear cooperation agreements governing research reactor exports with the United States in the mid-1950s, and Brazil and South Korea also signed nuclear cooperation agreements governing power reactor exports with the United States in the early 1970s. Nevertheless, among the three cases in question, nuclear technology leverage proved the most useful in the Korean case because at the

time, Seoul had concrete plans to import a power reactor from the United States (Kori-2), and had long-term intentions to expand its nuclear energy program with US assistance. Brazil and Pakistan, on the other hand, looked primarily to West Germany and France, respectively, to expand their nuclear programs.

Washington employed its nuclear technology as both positive and negative leverage against South Korea. In August 1975, Washington offered to expand nuclear technology exports in exchange for cancellation of the reprocessing deal, and in December 1975, Washington threatened to inhibit future nuclear cooperation and withhold the export licenses for Kori-2 if Seoul did not cancel. After Seoul cancelled the transaction in January 1976, Washington facilitated the Korean purchase of an additional four power reactors and fuel fabrication technology from Westinghouse.¹⁰⁸ In the Pakistani case, Kissinger used nuclear technology as positive leverage in his second offer to Bhutto by proposing that the United States supply nuclear reactors and a fuel fabrication facility to Pakistan. Nevertheless, Bhutto, looking to the French for nuclear technology, was not swayed by these incentives.

Nuclear Financing Leverage

The United States also enjoyed significant nuclear financing leverage in the 1970s. Since the inception of Atoms for Peace, states without the resources for a nuclear program had depended on US grants and credits that accompanied US nuclear exports. Under the Atoms for Peace grant program (fiscal 1954 to fiscal 1962), the US government distributed \$11.7 million in grants for research reactor exports.¹⁰⁹ Similarly, the US government provided substantial financing for all significant power reactor exports: by fiscal 1975, the US Agency for International Development (USAID) had financed two of them with \$71.8 million in loans, and the Ex-Im Bank had financed the other thirty-seven with \$2.9 billion in loans and guarantees.¹¹⁰ In sum, the United States provided extremely generous financing for virtually every standard nuclear reactor export, including exports to Brazil, South Korea, and Pakistan (see [Table 2](#)).

Washington made use of its nuclear financing as positive leverage in the Korean and Pakistani cases. In the Korean case, Washington offered an expansion of financial assistance for US nuclear technology exports to South Korea, which appealed to South Korean nuclear power expansion ambitions. In the Pakistani case, Kissinger's two offers and the Carter's administration offer included financial support for a French power reactor and fuel fabrication facility. In the Korean case, Washington was also able to use nuclear financing as negative leverage because there was a pending \$249 million in credits for Kori-2 before Congress. In December 1975, Washington told Seoul that it would withdraw the request unless Seoul cancelled its reprocessing deal with France. After Seoul cancelled the project, Washington approved the \$249 million in credits for Kori-2, and over the next few years, the Ex-Im Bank provided South Korea with an additional \$995 million credits for the sale of the additional four Westinghouse reactors.¹¹¹

TABLE 2
US financing for reactor exports to Brazil, South Korea, and Pakistan (until 1976).^a

Recipient	Reactor Name	US Financing	Total Construction Cost
Brazil	IEA-R1	\$350,000	\$850,000
Brazil	IPR-R1	\$125,000	\$250,000
Brazil	Argonauta	\$100,000	\$200,000
Brazil	Angra-1	\$164,000,000	\$190,000,000
South Korea	KRR-1	\$350,000	\$750,000
South Korea	KRR-2	\$350,000	\$2,500,000
South Korea	Kori-1	\$253,000,000	\$320,000,000
South Korea	Kori-2	\$249,000,000	\$250,000,000
Pakistan	PARR-1	\$350,000	\$6,600,000

^a Clarence D. Long, "Nuclear Proliferation: Can Congress Act in Time?," *International Security* 1 (Spring 1977), pp. 56–57; Elmer B. Staats, "U.S. Financial Assistance in the Development of Foreign Nuclear Energy Programs," Report to the Committee on International Relations of the House of Representatives, US General Accounting Office, May 28, 1975; US Export-Import Bank, "Report to the U.S. Congress on Export Credit Competition and the Export-Import Bank of the United States," reports from 1971 to 1977.

Nuclear Fuel Leverage

The third source of US leverage stemmed from its nuclear fuel supply capabilities. In the early 1970s, all research reactors and almost 90 percent of power reactors required enriched uranium fuel.¹¹² At the time, the United States was a near-monopoly supplier of enriched uranium for states with market economies. Brazil, Pakistan, and South Korea all operated research reactors and, in the cases of Brazil and South Korea, also power reactors that depended on contracted enriched uranium from the United States.

Washington offered supplying nuclear fuel as an incentive for cancellation in all three cases. In the Brazilian case, Washington offered to guarantee nuclear fuel for future German reactors to be built in Brazil. In the Korean case, Washington offered a general increase in enrichment and reprocessing services to South Korea. And in the case of Pakistan, Kissinger's two offers and the Carter administration's offer included the supply of nuclear fuel to Pakistan's Kanupp-1 reactor, in light of the Canadian cutoff. Significantly, Washington was hesitant to threaten to cut off the supply of nuclear fuel to achieve its objectives, simply because doing so would have violated international contracts and jeopardized its reputation as a reliable supplier of nuclear fuel.¹¹³ Nevertheless, in the South Korean case, the United States did threaten to cut off the supply of nuclear fuel to Kori-1 if the Koreans did not "confirm" the US interpretation of their bilateral nuclear cooperation agreement.

Foreign Aid Leverage

In the years leading up to the three cases in question, USAID was providing approximately 100 states with foreign aid every year, including Brazil, South Korea, and Pakistan (see

Table 3). Nevertheless, foreign aid to Brazil paled in comparison to foreign aid to South Korea and Pakistan, simply because Brazil did not face the same level of regional security threats that South Korea and Pakistan did. Washington was also more willing to go beyond the nuclear sphere and use foreign aid as leverage in the South Korean and Pakistani cases because it had stronger evidence that these two states were pursuing nuclear weapons.

In the Pakistani case, the State Department used foreign aid as positive leverage: both of Kissinger's offers included arms sales credits, and Kissinger's second offer as well as Carter's offer included a generous foreign aid package. Washington also employed foreign aid as negative leverage through the Symington and Glenn Amendments, which threatened the suspension of economic and military aid (except food aid) to Pakistan. The threat of withdrawing foreign aid also appeared in the Korean case, when in December 1975, Washington told the South Koreans that pursuing the reprocessing contract would "jeopardize" US military aid.

Arms Sales Leverage

The fifth type of leverage that Washington employed was conventional arms sales. During the Cold War, the United States and the Soviet Union not only possessed the most advanced military technology, but also aggressively exported conventional arms to achieve their foreign policy objectives. Like foreign aid, US arms sales served as strong leverage over South Korea and Pakistan, but not over Brazil, since Brasilia had weaker regional security concerns.

In the realm of arms sales, Washington enjoyed significant positive leverage over Pakistan because NSDM 289 had effectively forbade the sales of advanced, offensive arms, and yet Pakistan had a strong desire for US A-7 aircraft. Secretary Kissinger twice offered to seek to modify NSDM 289 and provide the Pakistanis with A-7s. In his second offer, he included other arms sales such as M-60 tanks and Cobra helicopter gunships. The Carter

TABLE 3

US foreign aid to Brazil, South Korea, and Pakistan in millions of dollars (FY 1972 to FY 1976).^a

Country	Aid Type	FY 1972	FY 1973	FY 1974	FY 1975	FY 1976	Average
Brazil	Economic	21.0	53.8	17.2	14.7	4.0	22.1
	Food	5.7	9.6	6.2	8.4	0.7	6.1
	Military	20.8	17.6	52.7	65.4	44.6	40.2
South Korea	Economic	252.2	188.5	37.1	36.7	124.7	127.8
	Food	211.7	159.4	7.2	14.4	117.1	102.0
	Military	745.4	384.4	168.5	144.7	188.6	326.3
Pakistan	Economic	165.1	177.9	101.8	180.9	203.3	165.8
	Food	102.7	81.5	42.5	84.9	96.9	81.7
	Military	0.1	0.3	0.2	0.3	0.3	0.2

Note: Food aid is included in the economic aid figure.

^a USAID, "U.S. Overseas Loans and Grants and Assistance from International Organizations," report from 1977.

administration's offer also involved arms sales, but to Pakistan's disappointment, none that went beyond NSDM 289. In the South Korean case, Washington possessed significant negative leverage in arms sales, as South Korea was one of the largest recipients of US conventional arms exports at the time. In December 1975, Washington made use of this leverage by threatening to consider the termination of arms sales should Seoul not cancel the reprocessing transaction.

Implications for Today

This article recounts how the United States pressured suppliers and recipients to cancel proliferation-sensitive technology transfers in the 1970s. Pressure always first came in the form of diplomatic overtures to the supplier state; when this was not enough, US officials resorted to using concrete sources of leverage on the recipient state to achieve their objectives. Leverage centered around nuclear technology, nuclear financing, nuclear fuel supply, foreign aid, and arms sales.

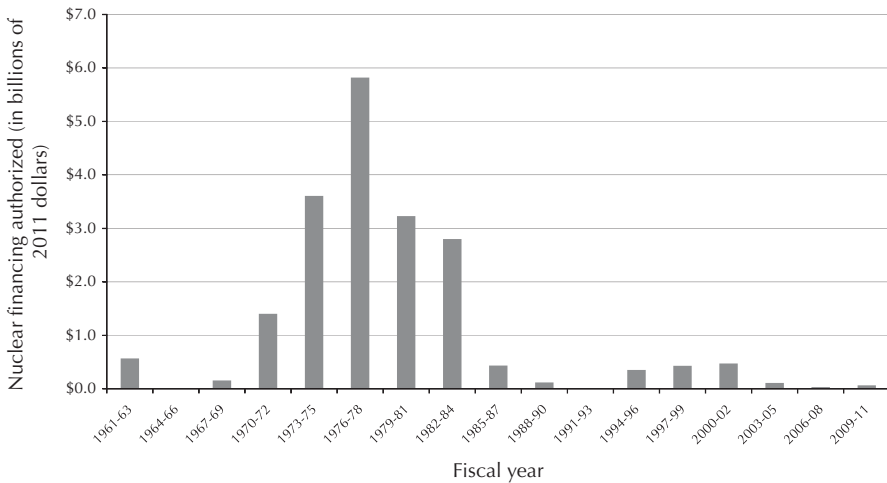
An examination of the way Washington privately dealt with proliferation threats in the 1970s may or may not speak to the way Washington deals with proliferation threats today. Nevertheless, one observation worthy of attention is that Washington no longer has at its disposal the nuclear leverage—nuclear technology, nuclear financing, and nuclear fuel—it once had and used.

In the nuclear technology realm, the position of US firms has dramatically changed since the 1970s. At the time, US firms boasted the most advanced nuclear technologies and dominated 90 percent of the power reactor market. Today, however, there are many competitive power reactor suppliers in Europe and increasingly in East Asia.¹¹⁴ The largest US nuclear reactor manufacturer, Westinghouse, is now owned and operated by Toshiba, a Japanese firm.

US dominance in nuclear financing has also disappeared. Whereas the Ex-Im Bank was the premier nuclear financing agency in the 1970s, today there are many national and international sources of reactor financing around the world. In fact, the Ex-Im Bank now provides far less financing than it did in the past, perhaps mostly as a result of the downward trend in US power reactor exports. In the 1970s, the Ex-Im Bank granted \$13.2 billion (in 2011 dollars) in nuclear export credits, whereas this past decade it has provided just \$207 million (in 2011 dollars) in nuclear export credits (see [Figure 1](#)).¹¹⁵ By contrast, South Korea's export financing bank is supplying \$10 billion in credits for a Korean consortium to construct and operate four power reactors in the UAE.¹¹⁶

The third type of nuclear leverage used by the United States in the 1970s, uranium enrichment, has also become much weaker. At the time of the three cases of intervention, the United States held a near-monopoly of enrichment services to states with market economies. Today, however, the United States is just one of many international enrichment suppliers, not to mention new international fuel banks that have emerged to enhance the security of nuclear fuel supply.

These three trends underscore that the United States today cannot effectively use the nuclear leverage it once had and used to deal with proliferation threats. Given that Brazil, South Korea, and Pakistan's intentions to acquire sensitive technologies in the 1970s

FIGURE 1United States Export-Import Bank nuclear financing (FY 1961 to FY 2011).^a^a Freedom of Information Act Request #201100037F, filed by the author (available upon request),

were not purely peaceful, this fact appears quite disturbing. Nevertheless, one cannot immediately conclude that the world today faces a greater threat of horizontal nuclear weapon proliferation for three major reasons. First, despite the loss of US nuclear leverage, the United States can still tap into other sources of leverage—such as foreign aid and military sales—to stem proliferation. Second, compared to the 1970s, other states in support of the nuclear nonproliferation regime now play a larger role in confronting proliferation threats. And third, most importantly, the nonproliferation world today looks very different from the nonproliferation world in the 1970s. Today, only five states—India, Pakistan, Israel, North Korea, and South Sudan—remain outside the NPT, most states are members of a nuclear weapon-free zone, and the norm among NPT non-weapon states against pursuing nuclear weapons has strengthened. As a result, some might argue that this lost nuclear leverage may simply be unnecessary today. Nevertheless, policy makers in Washington must realize that the United States no longer possesses the nuclear leverage it once depended on to deal with proliferation threats. At the very least, one could conclude that the ability of the United States to pursue its nonproliferation objectives unilaterally has significantly weakened.

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NOTES

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2. H. Jon Rosenbaum, "Brazil's Nuclear Aspirations," in Onkar Marwah and Ann Schulz, eds., *Nuclear Proliferation and the Near-Nuclear Countries* (Cambridge, MA: Ballinger, 1975), p. 255. Brazil had initially wanted the URENCO centrifuge enrichment technology, but the Dutch had vetoed its export. See Norman Gall, "Atoms for Brazil, Dangers for All," *Foreign Policy* 23 (Summer 1976), p. 171. See also Hartmut Krugmann, "The German-Brazilian Nuclear deal," *Bulletin of the Atomic Scientists*, February 1981, p. 34.
3. Lewis H. Diuguid, "Brazil Nuclear Deal Raises U.S. Concern," *Washington Post*, June 1, 1975, p. A1.
4. Werner Boulanger, "Nuclear Export Policy and Regulation for Non-Proliferation: Federal Republic of Germany," paper delivered at the International Conference on Regulating Nuclear Energy, Brussels, Belgium, May 16–19, 1978, p. 3. At the time, trilateral safeguards agreements between the supplying state, the receiving state, and the IAEA were standard for transfers of nuclear material or equipment from an NPT state to a non-NPT state. West Germany would ratify the NPT on May 2, 1975.
5. William W. Lowrance, "Nuclear Futures for Sale: To Brazil from West Germany, 1975," *International Security* 1 (Autumn 1976), p. 158.
6. National Security Archive (NSA), Nuclear Non-Proliferation Unpublished Collection (NNPUC), Box 6, Folder Nuclear Non-Proliferation 5703 (B6/5703), Secretary of State to US Embassy in Brasilia, "Brazil/FRG Nuclear Accord," June 14, 1975 (hereafter "FRG/Brazil Accord Telegram"); and David Binder, "U.S. Wins Safeguards in German Nuclear Deal with Brazil," *New York Times*, June 4, 1975, p. 16.
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9. NSA, NNPUC, B6/5703, Arthur A. Hartman to Mr. Sonnenfeldt, "FRG/Brazil Nuclear Accord and the Scheel Visit," June 12, 1975. See also Robert L. Beckman, *Nuclear Non-Proliferation: Congress and the Control of Peaceful Nuclear Activities* (Boulder, CO: Westview Press, 1985), p. 232.
10. NACP, RG59, HKS/B7, June 13, 1975, p. 3.
11. Rosenbaum, "Brazil's Nuclear Aspirations," pp. 255–56.
12. Senator John O. Pastore (Democrat of Rhode Island), *Congressional Record*, 94th Cong., 1st sess., June 3, 1975, p. S16582.
13. NACP, RG59, HKS/B7, June 13, 1975, p. 4.
14. NSA, NNPUC, B6/5703, FRG/Brazil Accord Telegram.
15. NSA, NNPUC, B6/5703, FRG/Brazil NCA Telegram, p. 6. See also Karl Kaiser, "The Great Nuclear Debate: German-American Disagreements," *Foreign Policy* 30 (Spring 1978), pp. 89–90. Technology safeguards meant that any facility in the recipient state (even if indigenously built) that replicated the technology of the transferred nuclear equipment would be under IAEA safeguards. As a result, these safeguards were often called "replication safeguards" at the time.
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17. NSA, NNPUC, B6/5703, US Embassy in Bonn to Secretary of State, "Brazilian Nuclear Deal: Replies to Parliamentary Questions," June 13, 1975. The technology safeguards were operationalized by requiring IAEA safeguards on any Brazilian facility constructed within the next twenty years that used the same physical or chemical process as a nuclear facility transferred by West Germany.
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19. Spector, *Nuclear Proliferation Today*, p. 243.
20. Kaiser, "The Great Nuclear Debate," p. 98.
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22. NSA, NNPUC, B6/5703, Secretary of State to US Embassy in Buenos Aires, "Brazilian Nuclear Debate," April 6, 1977.
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113. Washington's reputation as a reliable supplier of nuclear fuel had already been significantly damaged in 1974 when the US Atomic Energy Commission first stopped accepting new long-term enrichment contract requests and then classified almost half of the enrichment requests it had previously received as conditional. See *Congressional Record*, 94th Cong., 1st sess., June 3, 1975, p. S16591; and Elmer B. Staats, "Allocation of Uranium Enrichment Services to Fuel Foreign and Domestic Nuclear Reactors," Report to the Committee on Foreign Affairs of the House of Representatives, US Government Accountability Office, March 4, 1975.
114. Mark Hibbs, "Negotiating Nuclear Cooperation Agreements," Nuclear Energy Brief, Carnegie Endowment for International Peace, August 7, 2012, <<http://carnegieendowment.org/2012/08/07/negotiating-nuclear-cooperation-agreements/d98z>>.
115. Freedom of Information Act Request #201100037F.
116. Christopher M. Blanchard and Paul K. Kerr, "The United Arab Emirates Nuclear Program and Proposed U.S. Nuclear Cooperation," Congressional Research Service, R40344, December 20, 2010, p. 2.