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Threat II:

Leakage of Technology or Expertise to a Foreign-Controlled Entity

A proposed acquisition typically offers the foreign parent corporation some production or managerial expertise that it did not formerly possess, thereby providing the home government of the foreign parent an opportunity to deploy the newfound expertise in ways it deems desirable. Moreover, the additional production or managerial expertise usually strengthens, however marginally, the national defense (and specifically military) capabilities of the new home government.

For assessment of Threat II, the question then is twofold: How broadly available is the additional production or managerial expertise involved, and what difference would the acquisition make for the new home government? The following cases illustrate deliberations to address these questions.

Proposed Acquisition of LTV Missile Business by Thomson-CSF

The prototypical example of potentially worrisome technology transfer is the landmark case of the proposed acquisition of the LTV missile business by Thomson-CSF of France in 1992.[1]

The LTV Corporation found itself in bankruptcy due to underfunded pension obligations associated with the parent company's steel-making

1. Information about this case is drawn from materials prepared by Theodore H. Moran for the Subcommittee on Defense Industry and Technology, Senate Armed Services Committee, April 30, 1992.

operations. To raise cash, a federal bankruptcy court in New York considered proposals from Martin Marietta, Lockheed, and Thomson-CSF of France to purchase LTV's missile division and approved sale to the latter. Some of LTV's missile division capabilities were sufficiently close to those of multiple alternative suppliers that Thomson-CSF could obtain them elsewhere with relative ease. But three product lines—the multiple launch rocket system (MLRS), the Army Tactical Missile System (ATACM) long-range, near all-weather guided missile, and the line-of-sight antitank (LOSAT) missile—had few or no comparable substitutes, and one—the extended range missile interceptor (ERINT)—included highly classified technology that was at least a generation ahead of rival systems and virtually unique at the time. It is not clear from public sources exactly which LTV missile division products and services were formally included in the US export control regime of the time.

Thomson-CSF was 58 percent owned by the French government and had a long history of closely following its directives. Thus concern about the potential for sovereign conflict over the disposition and timing of Thomson-CSF sales, if the LTV missile division became part of the group, was substantial. Previous Thomson-CSF sales to Libya and Iraq had already provoked considerable controversy: A Thomson-built Crotale missile had shot down the sole US plane lost in the 1986 US bombing raid on Tripoli, and Thomson radar had afforded Iraq advance warning in the first Gulf War.

The US Department of Defense initially informed Congress that the Pentagon would insist on a special security agreement, or blind trust, for Thomson-CSF to perform security work on LTV programs, an arrangement that Thomson-CSF first opposed but later accepted. But CFIUS rejected the proposed acquisition when Thomson-CSF and the Pentagon failed to reach agreement on how to ensure that sensitive US technology did not somehow leak to the new French parent. (This concern reemerged in Finmeccanica's proposed acquisition of US defense supplier DRS Technologies; see chapter 4.)

This case demonstrated the importance of establishing a method for determining whether a foreign acquisition might threaten to provide a channel for unacceptable "leakage" of sensitive technology or other know-how. Such a method entails calculating the concentration or dispersion of the particular capabilities possessed by the acquired entity; when the entity presides over unique or very closely guarded capabilities that might be deployed in ways that could damage US national interests, the threat is genuine.

As the treatment of the proposed acquisition of 3Com by Bain Capital, with a minority stake by Huawei Technologies, will illustrate (see chapter 4), potential transfer of technology or know-how to a foreign company, and thence to a foreign government, via acquisition does not mean merely that such technology or know-how might give the latter an edge in capabilities. More importantly, in some circumstances, the acquisition may

enable the foreign government to identify weaknesses, shortcomings, or vulnerabilities to which US purchasers of the company's goods and services, including US government or US military purchasers, are exposed (perhaps unbeknownst to those purchasers). In other words, foreign acquisition might lead the new owner (and its government) to discover a hidden flaw in the company's systems that could be exploited at a later date against those who rely on the systems. Whether the US export control regime (including Department of Commerce Export Administration Regulations and Department of Defense certifications of exemption from Department of State International Traffic in Arms Regulations, or ITAR, categories) is sufficient to identify how the foreign government of an acquired firm might exploit knowledge obtained via the acquisition is not clear; the regulations may catalogue leading edge capabilities that the US government wishes to deny to potential adversaries but not address hidden chinks in the armor of home-country purchasers.

On the other hand, if rivalry among closely matched providers is strong, the potential harmful impact of technology transfer via foreign acquisition is greatly diminished and ultimately vanishes. If the entity that is the object of proposed acquisition presides over capabilities that offer roughly the same performance characteristics as alternative suppliers, the foreign acquisition poses no genuine threat.

Lenovo's Acquisition of IBM's PC Business

Competition among personal computer (PC) producers is sufficiently intense that basic production technology is considered "commoditized"—an observation that informs how CFIUS strategists should look at the Chinese purchase of widely available computer capabilities. More than a dozen producers compete for 50 percent of the PC market, and none shows an edge for long. Enhanced capabilities are embedded in the components, including hardware and software, for general or specialized uses that are sometimes highly concentrated.

An imaginary proposed foreign acquisition of Intel or Cisco would—and should—arouse the most serious CFIUS concerns, whereas an offer to acquire a PC assembler—even by a Chinese or a Russian company with close ties to the home government—should not. It is far-fetched to think that Lenovo's acquisition of IBM's PC business represented a risk of "leakage" of sensitive technology or provided China with military-application or dual-use capabilities that are not readily available elsewhere. (Deciding where the 3Com case falls along this spectrum of concern/nonconcern depends on an analysis of the interrelationship of all three threat types, as discussed in chapter 4.)

Beyond the "leakage" of technology and other capabilities, popular scare stories about foreign acquisitions in the United States sometimes en-

vision foreign investors coming in, like the Soviets in post–World War II Germany, dismantling plants and laboratories, and carting them off. But the reality is otherwise. Data show that foreign investors typically do not even transfer high-value-added activities and leading management functions back to the home country (the so-called headquarters effect) (Graham and Krugman 1989; Graham and Marchick 2006, chapter 3; Marchick and Slaughter 2008). On the contrary, they usually leave the most valuable newly acquired activities and management functions where they are—that is why they bought the assets in the first place—and bring new resources to improve the performance of the existing plants and laboratories.

Thus Lenovo has been expanding its operations in Purchase, New York, near IBM headquarters (in Armonk) and in Raleigh-Durham, North Carolina, even as it absorbed the IBM teams designing and selling ThinkPad notebooks and ThinkCenter desktop computers (IBM had outsourced most of the actual production years earlier). In general, the evidence demonstrates that greater foreign investment in a developed economy, including the US economy, bolsters the capabilities and competitiveness of firms based in the home country (for data see Moran 2009).

Once again, the use of a concentration test to assess Threat II is, as for Threat I cases, likely to be more useful in dismissing implausible assertions of potential harm to national security than in specifying the extent of an extra advantage from possible leakage of technology or product capability. Moreover, evaluations of Threat II will invariably have a dynamic dimension, as a foreign acquisition that affords the new owner (or its government) an initially small advantage may allow them to enhance the acquired capability over time.

Combining Threats I and II in a Controversial Case: CNOOC's Proposed Acquisition of Unocal

Taken together, the measures for identifying genuine national security threats provide the tools for a rigorous analysis of the Chinese oil company CNOOC's proposed acquisition of Unocal. Looking solely at the question of whether oil—and access to it—is "crucial" for the functioning of the US economy and military, the answer is clearly yes. Case closed![2] But from an analytical point of view, the case is far from closed. What about the concentration of alternative suppliers and potential switching costs? What about the potential "leakage" of sensitive technologies and managerial expertise?

2. Press statements on CNOOC's proposed acquisition of Unocal by Representatives Joe Barton (R-TX) and Duncan Hunter (R-CA). See Stephanie I. Cohen, "Lawmakers Rip CNOOC's Unocal Bid," July 13, 2005, available at www.marketwatch.com (accessed on June 17, 2009).

In the year preceding the proposed acquisition (2004) Unocal produced 159,000 barrels of oil per day (70,000 of them in the United States) and 1,510 million cubic feet of gas per day (577 million in the United States)— thus approximately 40 percent of its oil and gas production was in the United States. Unocal had proven reserves of 659 million barrels of oil and 6,658 billion cubic feet of natural gas, of which 26 percent were in the United States.

The proposed acquisition engendered concern that CNOOC might divert some or even all of Unocal's energy supplies exclusively to meet Chinese needs. (Rerouting the production would be a highly complicated and expensive undertaking, however, since US pipelines across western states flow west-to-east; thus oil from the Gulf of Mexico would have to be shipped by tanker via the Panama Canal.) If the Chinese government mandated such a reallocation, it is prudent to suppose that even a privatized CNOOC could be forced to follow home-country directives.

But would this outcome harm the United States? Based on the criteria set forth in chapter 2, such a diversion would constitute a "threat" to US interests (economic, political, or national defense) only if sources of supply are tightly concentrated and switching costs are high. But 21 countries (including 15 non-OPEC countries) have oil for export greater than Unocal's entire US production, and six more could be called on to make up for a large portion of Unocal's US output. With US oil consumption at 20.7 million barrels per day and US oil imports at 12.4 million barrels per day, US buyers would simply replace Unocal's minuscule production (three-tenths of 1 percent of US use) with extra imports, leaving net imports and the US balance of payments in energy unchanged. US courts would force CNOOC to pay the switching costs if contracts were broken.

Although US energy needs would be better served with an energy policy that promotes efficiency, reduces energy consumption, and stimulates the development of new energy sources that do not pollute or contribute to global warming, the idea that CNOOC's acquisition would have affected US national energy interests—negatively or positively—is a mirage. Protection of US interests derives from the dispersed structure and fungible qualities of the international oil industry. Whether CNOOC has Chinese government ownership (as at present) or is someday completely privatized, a CNOOC-Unocal subsidiary could still become the object of conflicting US government or Chinese government directives; however, based on the test of readily available substitutes, such a conflict would not necessarily constitute Threat I.

Could US oil be used to provision the Chinese People's Liberation Army (PLA)? Certainly, if the US government did not legally and/or physically block such shipments. But this would penalize the PLA through supplying more expensive oil from the Gulf of Mexico in comparison to provision from cheaper alternative commercial suppliers nearer to home. (If CFIUS strategists were permitted to enjoy a mischievous sense of hu-

mor, CFIUS would have *required* that a CNOOC-owned Unocal ship all of its North American output back to supply Chinese military forces.)

Moreover, in a bilateral crisis—perhaps over a confrontation across the Taiwan Straits—a CNOOC-owned US-based Unocal actually would represent a hostage in US hands, not the other way around. Allowing Unocal business (and Lenovo-IBM business) to proceed as usual would be a bargaining chip for the US government, helping to offset countervailing Chinese pressures on US investors on the Chinese mainland.

What about the second threat test? Might the sale of Unocal to CNOOC have represented a leakage or loss of technology that could damage the United States? Looking strictly at oil production technology (possible enhancement of Chinese antisubmarine warfare capabilities is considered separately below), the answer is clearly no: If the incorporation of Unocal's technology and managerial expertise into CNOOC enhanced the latter's performance in discovering and producing oil, the result would ease the pressure on world energy markets. That is, the spread of Unocal expertise throughout CNOOC would likely have had a positive global supply effect, even if small. At the margin, if (as is likely) Unocal engineers and managers improved CNOOC performance more than they might improve that of Chevron (the alternative bidder), the result would have been a net benefit for US—and global—energy consumers.

While the Chinese thirst for oil is a challenge that the entire world has to cope with, the Chinese drive to develop new energy sources is part of the solution, not part of the problem. Since the rise in oil prices, global investment in developing-country oil properties has fallen far below what the economics of the market would predict—20 percent below, in the calculations of the International Energy Agency (IEA)—largely due to lengthy haggling between host governments and traditional foreign investors over the extraordinarily lucrative terms involved. The Chinese determination to find additional energy supplies, in contrast, shows a consistent willingness to pay premium prices for properties they can bring into production rapidly. What serves US national interests can be illustrated with a hypothetical question: If the government of China came to the World Bank for loans to support $1 billion of Chinese investments in prospective oil production, would US national interests be served by having the US executive director vote yes or no? The answer is clearly yes, to help ease global production constraints.

But a complete assessment of CNOOC's proposed acquisition of Unocal requires a second pass through the questions of excessive dependence and potential leakage of technology.

The question of excessive dependence arises because the Unocal purchase would have included a wholly owned subsidiary, Molycorp, with the only rare earth mine located in the United States, at Mountain Pass, California (although Molycorp ceased mining production there in 2003, the property remains open on a care-and-maintenance basis). The term

"rare earths" is something of a misnomer, according to the US Geological Survey, as it refers to a "moderately abundant" group of 17 elements—the 15 lanthanides, scandium, and yttrium (Hedrick 2003)—for which there are multiple international sources (the principal exporters are Australia, Brazil, Canada, China, Kenya, Madagascar, Mozambique, and South Africa).[3] In addition, large new rare earth deposits exist in Australia and China (but have not been fully developed because of insufficient demand). Thus CNOOC ownership of Molycorp (via Unocal) would not have appeared to offer the Chinese government tight control over a crucial input for the US economy as substitute supplies are easily accessible.

Some members of the rare earth family, however, are genuinely rare. Europium, for example, is one of the least abundant. It absorbs neutrons and is used in control rods of nuclear reactors. Since the Molycorp property is located in the United States, it is difficult to see how Chinese government directives could have denied the United States access to europium. Nonetheless, it would have been appropriate for a thorough CFIUS analysis to consider whether Molycorp should be included in the proposed CNOOC acquisition of Unocal or sold off to an American buyer.

With regard to potential leakage of sensitive technology, assertions were made that Unocal seismic technology had dual-use possibilities that could not only enhance oil exploration but also reinforce Chinese antisubmarine warfare capabilities. Investigation of these assertions would involve highly specialized—perhaps highly classified—expertise. But the guiding criteria would remain the same: Would the acquisition of Unocal seismic technology confer capabilities that are closely held and not available for Chinese purchase or hire from other alternative sources? The assessment of Threat II hinges on how broadly the technology or managerial expertise conferred is available and what net difference the acquisition would offer to the new home government.

3. Rare earths are used in automotive pollution control catalysts, petroleum cracking catalysts, permanent magnets, rechargeable batteries, fiber optics, and medical applications such as magnetic resonance imaging. All US government stocks of rare earths in the national defense stockpile were sold off in 1998, in consideration of the relative abundance of supplies in the open market.