

Conventional Arms Transfers and US Economic Security

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Abstract

This article explains the economic and practical considerations in various approaches to implementing President Trump's recent direction on conventional arms transfers (CAT) that decisions should consider economic security. CAT will require decisions about what to include in an economic security analysis, how to conduct the analysis, and who should conduct the analysis. Specifically, the analysis could focus on jobs and general economic effects or manufacturing and innovation concerns about the specific defense systems involved in the potential arms transfer. It could be based on detailed data collection specific to the proposed arms transfer or on the application of an economic model that would yield a faster but less precise result. Additionally, the analysis could be conducted by any of five plausible candidate organizations within the US government. While all options involve trade-offs, using an economic model would likely offer greater insight into the macroeconomic effects of a potential arms transfer, notably its effect on US employment. However, a targeted effort to collect and analyze transaction-specific data would offer greater insight into the effects on US defense industrial capability and the potential ability of the sale to save money in the US defense acquisition budget.

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On 19 April 2018, President Trump issued a National Security Presidential Memorandum directing revisions to the US Conventional Arms

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Transfer (CAT) policy.¹ The president has been especially interested in the economic implications of arms transfers, and they are, indeed, worth a good deal of money. The United States closed deals for \$55.6 billion in government-mediated Foreign Military Sales in fiscal year 2018, a 33 percent increase from the prior year but less than the 2012 record of \$69.1 billion.² Unlike most US trade, arms sales require specific approval from the US government, through a deliberate process involving several executive branch agencies—most notably the Departments of State (DOS) and Defense (DOD). Ultimately sales are subject to congressional approval (or disapproval) for amounts above certain threshold values.

Regulation of arms transfers by an overarching presidential policy statement dates to the Carter administration. The president set out to limit arms exports with “a strong presumption of denial,” a policy goal that did not even survive the Carter administration.³ The idea of a CAT policy did survive. Through four subsequent iterations, CAT policy made arms sales decisions depend on US diplomatic relations with the purchasing country, the national security implications of transferring particular technologies, and the human rights performance of the purchasing country. The CAT policy did not (and does not) provide an explicit prioritization of these various concerns. So each approval or disapproval of a transfer is determined on a case-by-case basis.

President Trump’s memorandum changed many parts of the process, attempting to streamline CAT and focus more upon the implications of third-party countries’ potential arms exports to the same purchasing country. Trump tasked the Departments of State and Energy with issuing detailed implementation memos. Additionally, the DOD’s Defense Security Cooperation Agency, whose job it is to oversee Foreign Military Sales, is also working on adapting its rules and procedures.

Perhaps the most significant change in President Trump’s memorandum is that it added “economic security” as a criterion to the arms transfer decision-making process.⁴ Nearly twenty-five years ago, President Clinton added a vague statement that the arms transfer policy should “consider the impact on the US arms industry when deciding whether to approve an export.”⁵ Critics worried that Clinton’s policy would draw pork-barrel political considerations into US foreign relations and that the effort to sustain the US defense industry would work against prioritizing strategic and human rights concerns.⁶ The industrial goal subsequently faded until President Trump resurrected it in his

new version of the CAT policy. Economic security interests, as defined in the memorandum, include “bolster[ing] our economy; spur[ring] research and development; enhanc[ing] the ability of the defense industrial base to create jobs; [and] increas[ing] our competitiveness in key markets. . . .”⁷ Future decisions on arms transfers will “consider . . . [t]he transfer’s financial or economic effect on United States industry and its effect on the defense industrial base, including contributions to United States manufacturing and innovation.”⁸

To be effective, the new policy must go beyond ad-hoc references to economic security as an additional rationale for approving sales that leaders desire for other reasons. The government must decide on specific criteria for measuring the economic security impact, a process for assessing proposed arms transfers, and an organization that will lead the assessments and make other participants in the arms transfer decision-making process pay attention to the economic security assessments.⁹

Giving due weight to the economic security impact analysis will require that it be completed reasonably quickly and that results be included in the same package of reports that cover foreign relations, technical, and human rights aspects of an arms transfer case. A complete data-gathering and analysis effort on the economic security impact of a proposed transfer might take longer to prepare than the other initial inputs to the decision process, potentially slowing an already slow process. Nevertheless, there are reasonable steps that could be taken—such as building the economic security analysis on existing, collected data or using an economic model to estimate the proposed transfer’s economic effects—that would prevent the new analysis from becoming the rate-limiting step in CAT decision making. Furthermore, even an ideal, streamlined process to consider foreign relations, technical, and human rights aspects of the case will always take time, allowing the potential for the economic security impact analysis to collect data without presenting an undue overall delay.

The new emphasis on economic security will add some complexity to an already complex, judgment filled process, but there is every reason to expect that the combined decision-making process will continue to function reasonably well. Combined with President Trump’s streamlining reforms, the change may on balance make the United States, already the leading arms exporter in the world, even more competitive.

This article explains what the economic security assessment should look for in a proposed arms transfer, how the economic security as-

assessment should be conducted, and who should conduct the economic security assessment. The implementation details of economic security analysis of CATs are themselves important. Furthermore, discussing the issues in this context also offers an opportunity to consider how we might think about the relationship between defense acquisition and economic security. We can also consider the appropriate definition of economic security more broadly.

What to Look For in an Economic Security Assessment

The Presidential Memorandum regarding US CAT policy emphasizes two distinct economic security goals. The first goal is to expand the US economy. The second goal is a more fine-grained emphasis on improving *economic security*.¹⁰ General US economic performance has security implications because the economic size and wealth of the United States ultimately funds the defense budget that converts economic power to military power. However, any contribution of arms transfers to the general economic health of the United States is separate from its detailed security effects such as stimulating innovation in defense systems or preserving defense industrial capability to make specific weapon systems. In some ways, this difference is akin to the difference between macroeconomics and microeconomics. The Presidential Memorandum directs that both kinds of effects be considered in the arms transfer approval process.

At the macroeconomic level, arms transfers can be a new source of demand for American industry. The additional effort to produce goods and services for export can stimulate and expand the supply side of the US economy relative to a hypothetical world in which that export demand did not exist. If the US economy has slack inputs, notably unused labor—unemployed workers or potential workers who choose not to look for jobs—the export demand can provide a stimulus that uses those slack inputs, expands the employed population, and increases total US economic output. If, instead, the United States were already at full employment before the export demand, then the exports would require producers to outbid existing users of inputs in the US economy—meaning the exporters would offer higher wages—and the new export-oriented production would increase at the expense of other US economic activity. Presumably, that other economic activity would be lower value-added work, because the effort to bid away inputs from the other activity would succeed by offering greater compensation in the export-oriented sector.

The net effect of the exports would increase US gross domestic product (GDP) and create “higher-paying jobs” for American workers. Foreign consumers would pay the higher costs of the export-oriented production, although with arms sales the US government sometimes subsidizes the transaction with military aid, reducing or even eliminating the net economic benefit to the US economy.¹¹

We have recently seen examples in the US defense industry of the multiple possible economic effects of approved arms sales. Foreign demand for Patriot sales (both for missiles and the entire weapon system) has been brisk lately, and that has led to commitments to expand production capacity and employ new workers at both Lockheed Martin and Raytheon.¹² Both Patriot producers have also placed additional orders with their suppliers—some of whom have presumably also expanded production capacity. Many of the particular supplier companies involved are less publicly visible, as are their commitments to expanded employment.¹³ These arms sales have created “new jobs,” meeting President Trump’s commitment to “jobs, jobs, jobs.”¹⁴ However, the United States is already near economists’ estimates of “full employment,” including specifically in the regions around the Grand Prairie, Texas, operations of Lockheed Missile and Fire Control Systems and the Andover, Massachusetts, operations of Raytheon’s Integrated Defense Systems.¹⁵ Assessing the economic impact of Patriot export sales requires detailed information about the job market in the areas where the missiles are made, the skill profile of the additional workers required to build the Patriot missiles, and the production of other products that might not happen as workers are drawn into the defense sector.

Other recent high-profile arms sales cases have only “created” jobs in a relative sense by maintaining production in a facility that would otherwise have closed and enabling the workers there to remain employed. For example, Boeing’s sales of F-15s to Qatar and F-18s to Kuwait have extended the aircraft production backlog at Boeing’s St. Louis facility, keeping alive a production line that faced imminent closure.¹⁶ An economist would count those sales as “job creating” compared to a future world in which the arms sales had not happened, even though Boeing did not need to hire a new workforce the way Lockheed and Raytheon did for Patriot’s expanding foreign sales. To assess this sort of job-creating effect of arms sales requires detailed knowledge of the backlog and operations of the defense contractor producing the exported weapon.

Overall, the economic benefit of expanding exports in a particular sector is greatest when that sector has slack inputs before the export transaction and when the costs of training workers and the time required to attract sufficient skilled workers to the export-oriented production facility are relatively low. Economists have argued that shifting workers into the defense industry as a mechanism for general economic stimulus is inefficient compared to other mechanisms of government-supported economic stimulus (ranging from infrastructure spending to tax cuts to funding for education). That is, the government needs to spend more money per job created or per dollar of expanded US output. However, if a foreign government is paying that cost, the net effect on the US economy would be positive, or we could think of the expanded employment as highly “efficient” per dollar of US government spending.¹⁷

Conventional arms transfers can have separate, microeconomic effects of interest to a discussion of economic security, including effects on innovation and manufacturing highlighted in the Presidential Memorandum. The defense industry is not like a normal commercial industry, where corporations use retained earnings from their past sales—or borrowing from investors, who expect to be repaid from future sales revenue—to invest in research and development.¹⁸ Innovation in the defense industry is mostly supported by direct government research and development (R&D) contracts. That is, the DOD customer directs the trajectory of innovation and pays for specific R&D effort. Another fraction of total defense R&D comes from companies’ Independent Research and Development (IR&D) expenditures, reimbursed by the government as part of the overhead cost of other government-funded defense projects. IR&D spending is company directed, but it is also paid for by the DOD customer, not drawn from the company’s retained earnings. As a result, general increases in defense firms’ profitability—which might stem from arms sales approved under the CAT policy—do not generally have much effect on defense innovation at the systems level. However, many suppliers in the defense supply chain operate on commercial terms, and for them, the general added revenues from expanded defense sales contribute to the retained earnings that support their R&D investment.¹⁹ Thus, at the supplier level, arms sales can contribute to US innovation. However, generally, the suppliers are less visible, as are the innovations they might choose to invest in with the marginal dollar of income. Due to that lack of visibility, it would be difficult for an economic assessment, as

part of the CAT approval process, to give much weight to the potential innovation-related investments by commercial firms at lower tiers of the defense supply chain.

Arms exports still sometimes contribute directly to innovation in a way that should be considered in arms transfer decisions. Specifically, foreign buyers sometimes purchase upgraded equipment compared to what the US DOD has purchased in the past, and foreign buyers then pay the R&D cost of producing those upgrades. In some instances, as with Lockheed Martin's F-16, the US has not purchased any of the upgraded product—meaning that the particular innovations created for export sales to the United Arab Emirates and others have not contributed directly to US national security. In those cases, perhaps CAT decision makers should have considered the option value that creating those upgraded F-16s offered to the US Air Force. On other occasions, the US has directly benefited from export-supported technology upgrades—as on Patriot, Aegis, and other missile defense systems—where DOD has continued to purchase post-upgrade weapons from US contractors after export sales funded technology investments. Considering this pathway to innovation in an assessment of the economic effects of a potential arms sale requires detailed knowledge of the likely trajectory of future US defense procurement spending. In general, the more recently the exported system has joined the US weapons inventory, the more likely that this pathway could contribute some economic security (innovation) benefit to the United States through approval of an arms transfer. This is because it would be more likely that the US military would still be building its inventory of the newly upgraded system.

CATs have a clearer, direct effect on economic security via their effect on US defense manufacturing. Because weapon systems tend to stay in the US military inventory for so long, they often require spare parts for maintenance years after the initial production run is complete. DOD needs to pay the overhead cost of maintaining the production capacity for those spare parts, even when the production rate for spares is much slower than the initial production rate during original manufacture of the defense system. That slower rate tends to drive the unit cost of spare parts dramatically upward. In some cases, demand for spare parts drops below the minimum technical sustaining rate, meaning that the workers lose the ability to maintain quality standards even when the buyer is willing to pay very high unit costs. In other cases, the government

does not realize how much the cost of production has risen over time and does not invest enough to keep the supplier interested or able to produce the part profitably, so production drops below the minimum economic sustaining rate. These situations create potentially very costly Diminishing Manufacturing Sources or Material Shortage (DMSMS) problems.²⁰ Arms exports and the expanded demand for future spare parts business that they create can help reduce the unit cost of spares production by keeping up production rates, maintaining workers' skills, and ameliorating the risk of DMSMS by bolstering revenue for critical and fragile niches in the supply chain. These effects have been observed in recent years in export sales of M-1 Abrams tanks and M-2 Bradley infantry fighting vehicles, among others. Assessing these manufacturing effects of arms sales requires detailed knowledge of the defense supply chain, including the technical characteristics of the components that suppliers make, the financial status of each of those suppliers, and the business strategy of the executives at each supplier—knowledge that is not often available to the government or defense industry prime contractors.

Finally, CATs can contribute economic benefits to the United States through the economies of scale that are often available in defense systems production. If foreign sales are figured into the cost estimates from the start of a project, and foreign buyers contribute to development and capital investment spending, the cost of a project to the US defense budget will be proportionately reduced, benefiting US economic security. For example, the F-35 program claims to have benefited from this dynamic, although the higher overhead cost of managing a multinational development program and the redundancies of building extra final assembly and sustainment facilities overseas cut against the economies of scale benefits.²¹ In some European multinational aircraft development programs, governments have presumed that programs would gain very large benefits from economies of scale that have not materialized. This is due to technical and management challenges in the programs or the countries' failure to follow through on their initial purchase commitments. The result in those cases was that including projected economy of scale benefits of foreign sales in a program's management baseline added to rather than reduced program instability and hurt economic security.²² Estimating the net economic effect of expected economies of scale as part of a CAT decision would require sophisticated, reliable understanding of program

dynamics that might be beyond what the US government should reasonably count on in its decision making.

Overall, the new economic assessment in the CAT policy could meaningfully consider two separate types of economic benefits that might derive from arms sales: first, macroeconomic effects, especially via effects on employment, and second, microeconomic effects on specific firms and products, such as funding for component upgrades and prevention of DMSMS challenges. The methods for assessing these two types of effects would likely differ, and each would present its own challenges to the data collection and analysis process.

Conducting the Economic Security Assessment

The two main methods for assessing economic and economic security impacts are: 1) collecting actual data on companies' planned reactions to a potential arms transfer, and 2) using an economic model to estimate the plausible effects of the potential arms transfer. Neither method can be expected to produce an exact answer, and both methods involve trade-offs. On the one hand, the first method (using real data) might perform somewhat better at assessing the microeconomic or economic security effects of the potential arms transfer. Only fine-grained data collection can find the critical niches in the defense supply chain that are on the brink of failure but that could be sustained by an arms export deal. An economic model cannot yield answers about specific companies, their labor forces, and their investment plans. On the other hand, the second method (using a model) might do better with the macroeconomic or generalized employment effects of the potential arms transfer. This is because a macroeconomic model can take into account general equilibrium effects (e.g., whether the economy is already at full employment) in a way that data collection from specific companies cannot (because the specific companies do not know what other companies they would potentially be poaching workers from, in their arms export-led growth scenario). Using a model would also be a more practical solution for real-world decision making. The model could rapidly yield an estimate about the effects of a particular CAT case without extensive fresh data collection. However, it would certainly sacrifice accuracy and ignore or neglect the most important economic security impacts of a potential arms transfer that President Trump highlighted in the Presidential Memorandum.

Collecting actual data about the effects of a potential arms transfer would be both slow and difficult. In the modern defense industry, the prime contractors still often employ the largest group of workers on a project at the site of final assembly, but many more workers are employed across hundreds of supplier companies. Moreover, the prime contractor often does not make many of the critical components that give the defense system its edge. As a result, collecting data just about the prime contractor would be insufficient to inform the economic security aspects of the CAT decision-making process.²³

Unfortunately, the government does not generally know the list of even the most critical companies in the supply chain for defense systems because prime contractors consider that information to be proprietary. The result is that the government would probably not know whom to contact regarding the economic security effects of a potential arms transfer. Furthermore, the process of developing the list of companies to contact, soliciting responses, and analyzing the data generally would take months—even if there were a substantial staff working on the project.²⁴ Adding a government data collection process to CAT decision making would slow down the process further and would be inconsistent with one of the other primary goals of the new Presidential Memorandum, streamlining CAT reviews.

The US could, as part of its renewed commitment to protecting American industry, invest substantial effort in better understanding the defense industrial base in a way that is not tied to a particular decision about a potential arms export deal. A routine data collection policy could be applied throughout the contracting process. For example, the US could require prime contractors to provide supply chain lists as part of normal language on all Major Defense Acquisition Program contracts and flow that requirement down to lower-tier suppliers.²⁵ A process along these lines is already used in the nuclear Navy.²⁶ Alternatively, the government could collect data on the supply chain separately from the contracting process through independent surveys, as it attempted to do briefly in the early part of this decade through the sector-by-sector, tier-by-tier (S2T2) project.²⁷ Such general knowledge about the defense supply chain could be applied as part of the CAT decision-making process. However, even the Trump administration shied away from such a massive data collection effort as part of its implementation of the July 2017

*Presidential Executive Order on Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States.*²⁸

The defense industry has also generally resisted such government data collection efforts. As an alternative, the prime contractors could take the lead in actual data collection by voluntarily providing information on critical niches, DMSMS problems that could be addressed through arms sales, and prospective hiring by themselves and their subcontractors to meet production requirements for the arms sale, etc. However, in many cases, the prime contractors also do not know who their critical suppliers are because the first-tier subcontractors consider their lists of suppliers to be proprietary. Furthermore, there is an obvious incentive for prime contractors and their suppliers to exaggerate the potential benefits of the arms sale in their data collection efforts—not by committing fraud, but rather by taking an optimistic view every time they consider a range of possible outcomes. Optimistic assessments would likely compound through the supply chain—as each level of respondent reported an assessment at the high-end of the range reported at the lower level. That kind of bias was one of the fundamental problems faced by the economic planning ministry in the Soviet Union.²⁹

If the economic analysis of the potential arms transfer were to focus only on employment effects, many of the small suppliers—even those that make critical components—could be ignored in the assessment. Large suppliers that employ the bulk of the workers on a project tend to be more visible to the prime contractor and the government.³⁰ It is plausible that the government could survey the relevant major suppliers to get a rough estimate of the overall employment and investment status of the system being considered for sale. The government could also draw an arbitrary line at the third- or fourth-tier of the defense supply chain, limiting the scope of any data collection effort. It could further focus on only the largest facilities within its tier limit, because they would be most likely to react to a particular arms sale with substantial hiring or new capital or R&D investment. That would make the survey effort more practical and would still capture most of the relevant effects. However, it would certainly be imperfect and would also require considerable time for data collection and analysis, even without a commitment to chase down information about small suppliers that would not significantly affect the overall number of jobs involved in the project.

If the government decided to focus on employment and macroeconomic effects rather than looking for fine-grained economic security information about R&D and diminished sources or shortage issues, it likely could achieve most of what it wants in the CAT decision-making process through the use of an economic model. This effort would still require data collection that is not part of the current government routine—for purposes of calibrating the model and keeping it updated—but it would be a much smaller and less time-sensitive data collection effort than the alternative of trying to collect actual data on each specific arms transfer case.

The challenge for economic models is that few are specifically attuned to the defense industry. Most macroeconomic models have been developed for other analytical purposes, and they include assumptions about competitive and investment dynamics that do not mirror the reality of the defense industry. However, a model that is useful for assessing the economic effects of arms sales must build on a model of the entire economy, not just because the defense industry competes with other sectors for skilled labor but also because the dedicated defense industry's supply chain includes companies that identify almost every North American Industry Classification System code as their primary area of effort.³¹ Perturbations induced by CAT will propagate into the rest of the economy, and the effects on every sector of the US economy can be estimated by using economic input-output tables. The modeling requirement is for a general model of the US economy that has been fine-tuned to focus on the defense sector by experience, calibration efforts, and modified assumptions. Unfortunately, the economic models themselves are often proprietary. This means that their usefulness is linked not just to the general tendencies of economic modeling but also to the specific issue of who owns the particular economic model and which organization performs the analysis. However, several reasonable options do exist for models that could contribute to the CAT decision-making process.

Organizing the Economic Security Assessment

There are five principal options for the organization that might lead the economic security analysis as part of the CAT decision-making process: the DOS's Office of Regional Security and Arms Transfers, the Department of Commerce's (DOC) Bureau of Industry and Security (BIS), the DOD's program office for the system under consideration, DOD's Office of Cost Assessment and Program Evaluation (CAPE), and a

Federally Funded Research and Development Center (FFRDC). None of the organizations mentioned is a perfect fit. However, some organizations fit better than others.

The State Department will always play an important role in arms transfer decisions because arms sales are an important tool for US diplomacy. The DOS will lead most discussions of the effect of an arms transfer on US foreign policy and human rights protections in foreign countries—the traditional considerations in arms transfer decision making. However, the State Department does not have background expertise in economic analysis, especially of the defense industry, even though US diplomacy plays an important role in export promotion. Economic statecraft is a recognized tool of the DOS, and many Foreign Service Officers choose “economic officer” for their career track. Although the Foreign Service may have largely overcome its historical legacy of dominance by political officers, yielding a more balanced Foreign Service, the DOS does not specialize in the economy.³² Moreover, Congress has persistently questioned the State Department’s commitment to the US economy. For example, Congress created and empowered the Office of the US Trade Representative to lead trade negotiations when previously trade negotiations were led by the State Department. Even if State were to develop the required expertise in defense economics, it would lack institutional commitment and organizational power to advocate on behalf of the results of the economic security analysis at the pinnacle of CAT decision making.

By contrast, the DOC is widely judged to have an organizational culture that is committed to the promotion of US industry. The DOC is not institutionally powerful in the US interagency decision-making process—a stark contrast to the position of many other countries’ ministries of industry or economy—but it is likely to use what power it has to advocate on behalf of economic security interests.³³ Furthermore, the DOC holds the authority to conduct mandatory surveys of industry under the Defense Production Act (DPA).³⁴ If the implementation of the economic security mandate under the CAT policy chooses to go the route of collecting actual data to pursue fine-grained microeconomic analysis, the DOC is likely to play a leading role. The Office of Technology Evaluation (OTE) within the Commerce Department has repeatedly used its DPA authority to conduct industrial base assessments of specific sectors of the US economy, notably including defense industrial base assessments.

OTE knows the particulars of industrial base impact well and is in a position, if augmented by additional data collection and analytical staff, to conduct the microeconomic DMSMS and innovation-oriented analysis to support decision making about arms sales.³⁵

Even more relevant, the Commerce Department's BIS already collects economic effects data related to arms transfers for its annual report on *Offsets in Defense Trade*, and BIS has built up defense-specific economic expertise as a result. The offsets report makes simplifying assumptions that would not be appropriate for a fine-grained assessment of the economic security impact of arms sales. Examples include assuming that all work that contributes to arms exports takes place within the United States (despite global participation in the defense supply chain) and assuming that all offset work takes place in foreign countries but would have taken place within the United States without the offset agreement.³⁶ These assumptions mean that the BIS offset report almost certainly gives a substantially inaccurate picture of the net employment effects of offset agreements, but perhaps BIS gets the order of magnitude right, which is a start. Additionally, BIS uses an established methodology for analysis of offsets that is based on the *Benchmark Input-Output Table* that the DOC maintains as a model of the US economy.³⁷ That input-output table is used as the basis for many non-DOC economic models and appears the best source for economic analysis based on that modeling methodology. Moreover, the DOC also conducts the *Census of Manufactures* of the United States, a comprehensive survey that takes place every five years, supplemented by a smaller *Annual Survey of Manufactures*. Those two sources provide vital contextual data for assessing the economic security impact of potential arms transfers.³⁸

Just because the Commerce Department collects routine economic data and creates a benchmark economic model does not mean that it is best equipped analytically to apply that model to specific circumstances, notably including potential arms transfer decisions. Even a government decision to apply the survey methodology as its mechanism to implement economic security analysis does not mean that the DOC should necessarily take the lead on economic security analysis for conventional arms transfer decisions. The DOC often conducts surveys on behalf of other government agencies, which can then analyze the resulting data themselves. However, the survey data collection mechanism might work

more smoothly and quickly if the DOC had the lead for economic security analysis of proposed arms sales.

The third candidate for leading the economic security analysis of potential arms sales is the relevant DOD program office. Because the program office is in routine touch with the companies involved in the program and is directed as part of the *Defense Acquisition Guidebook* to monitor the manufacturability of the components and the overall system the DOD is acquiring, the program office has the best sense of critical and fragile niches in the supply chain that could be aided through an arms sale.³⁹ The program office, in cooperation with the Defense Contract Management Agency, also has actual (reported) cost data for the weapon system and has a sense of how production rates and economies of scale might affect production costs. Yet program office knowledge of the industrial side of its program is quite imperfect. After all, the program office often has an adversarial bargaining relationship with the companies that produce the defense system (over price, performance, and schedule), and it only receives data from the companies on topics that are covered by contractual language. Furthermore, the main source of the program office's data is the companies that build the system. These companies have a vested interest that leads them to be more willing to provide some kinds of data than others. Thus, program office data is likely to be biased in a way that might exaggerate the economic security impact of an arms transfer that the company wants to see approved. The program office itself may also have a reason for bias in considering the range of possible outcomes of an arms sale. Program managers are prone to optimism about their program's success to such an extent that DOD has established rules about managing programs to Independent Cost Estimates (ICE) performed outside the program office (either by or under the supervision of DOD CAPE) rather than to the Program Office Estimate. Program office staff may also lack the advanced analytical skills that would enable them to conduct credible economic analysis. Furthermore, there are many program offices, and most program office employees necessarily will not have a background in economics. As a result, program office analysis of the economic security impacts of potential arms sales may be considered suspect and could be downplayed in CAT decision making.

The fourth option for the economic security assessment would be to use the DOD Office of Cost Assessment and Program Evaluation.

It provides the Independent Cost Estimates for program management and has a set of well-established (yet imperfect) models for projecting programs' costs and economic impact. The Secretary of Defense has also designated CAPE as the lead advisor on defense economics. As a result, CAPE maintains several analytical models of the US economy that are fine-tuned to the needs of defense analysis. Specifically, CAPE has worked for many years with Interindustry Forecasting at the University of Maryland (INFORUM) to create an economic model called Defense Employment and Purchases Projection System (DEPPS).⁴⁰ If the economic security assessment process chooses to focus on aggregate employment impacts of arms sales, it would be natural to work on an evolution of DEPPS to estimate those impacts.

As it stands today, DEPPS incorporates a fine-grained model of the impact of defense expenditure regionally within the United States and on various categories of skilled labor. Even though the model makes imperfect assumptions about the location of actual outlays, at least DEPPS incorporates a rigorous input-output table, using a proprietary modified version of the DOC's benchmark table to make connections throughout the economy.⁴¹ DEPPS is designed to assess the employment impact of the entire defense budget proposal. However, one could also imagine CAPE working with the INFORUM experts to create a more fine-tuned version that could assess the impact of a particular arms sale. INFORUM engages in similar project-level work for other clients.⁴² The output of such a model would provide a general sense of the impact upon skilled labor in the US; however, it would not yield information about specific DMSMS challenges or innovation opportunities that program office-level analysis or detailed data collection could offer the CAT decision-making process. Using CAPE would exchange practicality and ease of estimation for the detail and accuracy that could be offered by another organization—assuming that potential bias could be overcome in the analysis by that other agency.

However, being part of DOD might hold back CAPE's usefulness for economic security analysis. While DOD has a strong interest in addressing DMSMS issues and in finding ways to share the fixed cost of its acquisitions with foreign partners, the organizational culture of DOD has long resisted paying serious attention to economic security issues. DOD believes that acquisition and arms transfer decisions are made exclusively through considerations of the national (military) interest.⁴³

Manufacturing and industrial base analysis are included in DOD's milestone decision-making framework for program management, but they are often perfunctory analyses. For example, Manufacturing Readiness Levels have not been incorporated as part of DOD programs' milestone reviews, nor has the DOD Industrial Policy office participated directly in milestone reviews in recent years.⁴⁴ Moreover, if DOD paid serious attention to DMSMS and critical and fragile niches in the industrial base, presumably DOD would face fewer surprises and desperate last-minute rescue efforts as critical suppliers go out of business because they are not paid enough to cover their fixed costs. Due to DOD's inattention regarding economic and industry issues, it is not likely that a DOD organization such as CAPE, even if it took the lead on the CAT economic security analysis, would present a strong case for ultimate decision makers to emphasize economic security in their reasoning. DOD would likely favor traditional national security concerns such as alliance relationships in CAT decision making.

Finally, FFRDCs might be tasked with conducting economic security reviews of potential arms sales. DOD calls on FFRDCs, notably including the RAND Corporation, the Institute for Defense Analyses (IDA), and the Center for Naval Analyses (CNA), to provide independent, high-quality industrial analysis for decisions.⁴⁵ FFRDCs employ high-end economists who have the requisite skills for the kind of economic security analysis suggested by the Presidential Memorandum on CAT policy. FFRDCs are also designed to maintain their analytical independence, and they generally have the historical track record to support their claims of maintaining independence.⁴⁶ Their analysts could also shift from program to program, as potential arms sales arise, which would make their employment at an FFRDC more efficient than trying to scatter economic analytical skills throughout DOD program offices.

FFRDCs have many other important commitments: they do not have slack resources, as each faces a congressionally imposed cap on the amount of work it can do for the federal government under its FFRDC contract each year.⁴⁷ Contracting with FFRDCs to conduct an economic security impact analysis of potential arms sales would likely come at the expense of established analytical efforts. Moreover, their analyses are relatively expensive, because the government must pay for very high-end skilled labor (Ph.D. economists, physical scientists, and political scientists) with security clearances. FFRDCs cannot compel sources to

reveal proprietary data. They mostly analyze data collected by the government or request data through voluntary surveys or interviews with companies and acquisition officials. That process may be slow, unreliable, and potentially biased—as discussed above concerning program offices requesting data from interested parties. Finally, FFRDCs also need a client for their analysis. In the end, FFRDCs might best fit into economic security analysis for CAT decision making by providing analytical support to CAPE (in the case of IDA, RAND, or CNA) or the DOC (which would require a new FFRDC arrangement, since the DOC does not currently have an FFRDC contract).

Conclusion

Even if it did not face time and resource constraints, the US government would not likely receive access to the data and analytics required for an ideal CAT decision-making process. Any practical process will be imperfect, but there are two reasonable approaches available that would better inform decision makers than the previous system, which did not significantly consider economic security impacts of potential arms transfers. A fine-grained analysis that would directly examine economic security effects—identifying critical and fragile niches that would benefit from arms transfers and opportunities to ameliorate DMSMS problems or to fund upgrades and innovations—would be slower than a model-based alternative that could emphasize general employment effects of arms transfers. Each of these approaches would reflect a different emphasis in the definition of economic security. Is economic security about particular technologies and industrial capabilities? Or is it about latent economic power in general, represented by overall industrial activity measured by employment levels and GDP?

On balance, a fine-grained analysis seems best undertaken either by the DOC's Bureau of Industry and Security or by DOD program offices. The independent expertise of FFRDCs would ideally support each organization. Alternatively, a model-based analysis that would emphasize general-equilibrium effects on overall employment in the United States would suit the analytical experience and capabilities of DOD's Office of Cost Assessment and Program Evaluation, again perhaps supported by one or more FFRDCs.

If resources and time were made available, the fine-grained solution would be more desirable than the model-based solution, especially if the

goal is to take economic security concerns seriously in the CAT process. Of course, the United States could ultimately decide to both collect specific data and use an economic model, if it were willing to make a major resource commitment to economic security analysis. This would provide insight into both macroeconomic considerations like the potential creation of high-quality jobs and also microeconomic considerations like ameliorating DMSMS problems. The Trump administration is already hiring additional staff to support the federal government's efforts on conventional arms transfers, but the additional resources may primarily seek to speed processing rather than to expand the analytical effort to engage economic security substantively.⁴⁸ It would be asking a great deal to hope that the new process might incorporate the full range of micro- and macroeconomic analysis.

There is not a perfect answer for how the economic security impact assessment should be conducted or who should conduct it. Ultimately, deciding whether to approve or reject a proposed arms transfer will require top decision makers to compare economic security effects to traditional concerns like national security and human rights effects.⁴⁹ There can be no formula for deciding how many dollars of economic impact would outweigh a likely human rights abuse or a tendency for an arms transfer to undermine rather than increase regional stability. However, the political judgment behind the final decision must weigh the full spectrum of factors and should be informed about all aspects of a potential arms transfer's effects, including its economic security effects, to the extent practical.

It is difficult to say whether arms sales have the potential to increase US economic security significantly. Critics are already questioning whether arms sales generate many good quality jobs, while advocates are confident arms sales can make a very substantial contribution.⁵⁰ Realistically, we do not yet have the data and evaluation process in place to judge effects. President Trump's memorandum offers the opportunity to create a process to resolve the question during future conventional arms transfer deliberations—and to allow future political leaders to weigh those economic benefits against other considerations in making arms transfer decisions. **SSQ**

Notes

1. White House, “Presidential Memorandum Regarding the U.S. Conventional Arms Transfer Policy,” 19 April 2018, <https://www.whitehouse.gov/presidential-actions/national-security-presidential-memorandum-regarding-u-s-conventional-arms-transfer-policy/>.

2. Paul McLeary, “US Arms Sales Overseas Skyrocketed 33% in 2018,” *Breaking Defense*, 9 October 2018, <https://breakingdefense.com/2018/10/us-arms-sales-overseas-skyrocketed-33-in-2018/>. “Direct Commercial Sales,” still regulated by the government but contracted directly between arms manufacturers and foreign governments, accounted for an additional \$136.6 billion in fiscal year 2018. Aaron Mehta, “The US Brought in \$192.3 Billion from Weapon Sales Last Year, up 13 Percent,” *Defense News*, 8 November 2018, <https://www.defensenews.com/industry/2018/11/08/the-us-brought-in-1923-billion-from-weapon-sales-last-year-up-13-percent/>.

3. Shimon Arad, “Trump’s Arms Exports Policy: Debunking Key Assumptions,” *War on the Rocks*, 28 September 2018, <https://warontherocks.com/2018/09/trumps-arms-exports-policy-debunking-key-assumptions/>.

4. White House, Presidential Memorandum.

5. Lora Lumpe, “Clinton’s Conventional Arms Export Policy: So Little Change,” *Arms Control Today* 25, no. 4 (May 1995): 9–15.

6. Lumpe, “Clinton’s Conventional Arms Export Policy.”

7. White House, Presidential Memorandum.

8. White House.

9. Even if the White House leadership actually intends to make decisions in an ad hoc manner or, more cynically, intends simply to use the rhetoric of economic security as a public justification for decisions that it makes on other grounds, it is quite likely that the executive branch departments involved—primarily State, Defense, and Commerce—will develop some sort of analytical process to support the economic security component of the CAT policy. Bureaucracies have good reasons to focus on standardized rules and processes, whether those reasons are rational-legal reasons designed to yield an optimal decision or are political reasons designed to protect bureaucrats from allegations of shirking and malfeasance. James Q. Wilson, *Bureaucracy: What Government Agencies Do and Why They Do It* (New York: Basic Books, 1989), 315–45; and Stephen P. Rosen, “Systems Analysis and the Quest for Rational Defense,” *Public Interest* 76 (Summer 1984): 3–17.

10. White House, Presidential Memorandum.

11. For a summary of relevant economic theory, see Charles H. Anderton, “Economics of Arms Trade,” in *Handbook of Defense Economics*, vol. 1, ed. Keith Hartley and Todd Sandler, (New York: Elsevier, 1995), 524–61.

12. Jen Judson, “Lockheed to Double Patriot Missile Production as Orders Explode,” *Defense News*, 11 July 2018, <https://www.defensenews.com/land/2018/07/11/lockheed-to-double-patriot-missile-production-as-orders-explode/>.

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14. Philip Rucker and Karen deYoung, “Trump Signs ‘Tremendous’ Deals with Saudi Arabia on His First Day Overseas,” *Washington Post*, 20 May 2017, https://www.washingtonpost.com/politics/trump-gets-elaborate-welcome-in-saudi-arabia-embarking-on-first-foreign-trip/2017/05/20/679f2766-3d1d-11e7-a058-ddbb23c75d82_story.html?noredirect=on&utm_term=.acf2d152046e.

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16. Chuck Raasch, “Boeing Jet Deal Means Big Boost for St. Louis Jobs,” *St. Louis Post-Dispatch*, 28 September 2016, https://www.stltoday.com/business/local/boeing-jet-deal-means-big-boost-for-st-louis-jobs/article_30fea475-4246-569b-8ede-1ade79d571c8.html.

17. Heidi Garrett-Peltier, “The Job Opportunity Cost of War,” Watson Institute, Brown University, 19 August 2014, <http://watson.brown.edu/costsofwar/files/cow/imce/papers/2014/The%20Job%20Opportunity%20Cost%20of%20War2014.pdf>.

18. William P. Rogerson, “Economic Incentives and the Defense Procurement Process,” *Journal of Economic Perspectives* 8, no. 4 (Autumn 1994): 65–90.

19. Eugene Gholz, Andrew James, and Thomas Speller, “The Second Face of Systems Integration: An Empirical Analysis of Supply Chains to Complex Product Systems,” *Research Policy*, 47, no. 8 (October 2018): 1478–94, <https://doi.org/10.1016/j.respol.2018.05.001>.

20. DOD defines DMSMS as “the loss or impending loss of the last known manufacturer or supplier of raw material, production parts, or spare parts.” See Defense Logistic Agency’s “Diminishing Manufacturing Sources and Material Shortages (DMSMS),” Department of Defense, <http://www.dsp.dla.mil/Programs/DMSMS/>; see also DOD’s, *Diminishing Manufacturing Support and Material Shortage Guidebook* (Washington, DC: Department of Defense, 2016), [https://www.dau.mil/guidebooks/Shared%20Documents%20HTML/DMSMS%20Guidebook%20\(SD-22\).aspx](https://www.dau.mil/guidebooks/Shared%20Documents%20HTML/DMSMS%20Guidebook%20(SD-22).aspx). Program offices establish plans to try to proactively prevent DMSMS problems from disrupting systems development, production, and sustainment, but those plans do not always work, and program offices often scramble to maintain schedule and performance in the face of DMSMS problems, often at significant cost.

21. Jonathan Caverley and Ethan B. Kapstein, “Arms Away: How Washington Squandered Its Monopoly on Weapons Sales,” *Foreign Affairs* 91, no. 5 (September/October 2012): 125–32; and Cynthia Cook et al., *Final Assembly and Checkout Alternatives for the Joint Strike Fighter* (Santa Monica, CA: RAND, 2002), https://www.rand.org/pubs/monograph_reports/MR1559.html.

22. Marc R. DeVore, “The Arms Collaboration Dilemma: Between Principal-Agent Dynamics and Collective Action Problems,” *Security Studies* 20, no. 4 (October–December 2011): 624–62, <https://doi.org/10.1080/09636412.2011.625763>.

23. Gholz et al., *Second Face of Systems Integration*.

24. As demonstrated by the government’s aborted 2010–2013 sector-by-sector, tier-by-tier (S2T2) assessment of the industrial base and its other, smaller, more targeted industrial base surveys. For criticism of the expense and time required to use surveys, see Nancy Y. Moore, Clifford A. Grammich, and Judith D. Mele, *Findings from Existing Data on the Department of Defense Industrial Base* (Santa Monica, CA: RAND Corporation, 2014), 1–2, https://www.rand.org/content/dam/rand/pubs/research_reports/RR600/RR614/RAND_RR614.pdf.

25. Creating such a requirement to reveal proprietary information to the government would run counter to the past two decades of acquisition reform efforts that have attempted to reduce the burden that inhibits some commercially oriented companies from participating in the defense supply chain. Jacques S. Gansler, *Democracy’s Arsenal: Creating a Twenty-First-Century Defense Industry* (Cambridge, MA: The MIT Press, 2011), 134–35.

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27. Jared Serbu, "DoD to Create Map of Defense Industry," *Federal News Radio*, 2 November 2011, <https://federalnewsnetwork.com/all-news/2011/11/dod-to-create-map-of-defense-industry/>.

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30. Harvey M. Sapolsky, Eugene Gholz, and Caitlin Talmadge, *U.S. Defense Politics: The Origins of Security Policy*, 3rd ed. (New York: Routledge, 2017), 127–28.

31. Gholz et al., *The Second Face of Systems Integration*, 1486, 1488–91.

32. Stephen D. Cohen, *The Making of United States International Economic Policy: Principles, Problems, and Proposals for Reform*, 5th ed. (Westport, CT: Praeger, 2000), 52–55.

33. Cohen, *Making of United States*, 55–57.

34. Department of Commerce, Bureau of Industry and Security, 15 CFR Part 702 [Docket No. 140501396-5463-02], US Industrial Base Surveys Pursuant to the Defense Production Act of 1950, Final Rule, *Federal Register* 80, no. 135 (10 July 2015): 41426–32.

35. For access to past reports and explanation of the survey authority, see US Department of Commerce, Bureau of Industry and Security's "Industrial Base Assessments." <https://www.bis.doc.gov/index.php/other-areas/office-of-technology-evaluation-ote/industrial-base-assessments>.

36. US Department of Commerce, Bureau of Industry and Security, *Offsets in Defense Trade: 21st Study*, (Washington, DC: US Department of Commerce, December, 2016), <https://www.bis.doc.gov/index.php/documents/pdfs/1620-twenty-first-report-to-congress-12-16/file>.

37. The DOC's Bureau of Economic Analysis (BEA) maintain data that "offer a comprehensive picture of the inner workings of the US economy, showing production relationships among industries and commodities." The idea is that the tables show the effects of a change in output in a particular industry on other industries in the U.S. economy. As the BEA goes on to state, "Businesses can use input-output data to develop economic projections and forecasting models. Economists can use the data to examine the role of information technology on structural change, productivity, and the sources of economic growth. Researchers can use the data to analyze the economic effects of specific events. Input-output data are updated each year and provide information on 65 industry categories. Detailed benchmark input-output statistics, produced roughly every five years, are further subdivided into 425 industries." See Bureau of Economic Analysis, "Input-Output Accounts." <https://www.bea.gov/data/industries/input-output-accounts-data>.

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41. OSD, CAPE, *Projected Defense Purchases*.” Appendix A. As an example of the imperfections in the DEPPS model, consider that it “hold[s] the spending distribution by state constant across all years for each industry and major category, based on the most recent three years’ average of prime contract award data,” as if prime contract award location matches the actual production location for the prime contractor (quote from p. 160).

42. “Inforum.” <http://inforumweb.umd.edu>.

43. Sapolsky et al., *U.S. Defense Politics*, 171–72.

44. Manufacturing Readiness Levels (MRLs) are a standardized scale for assessing manufacturing risk as an aid to program management. The Department of Defense has debated using MRLs as part of its acquisition process for more than a decade, but they are not currently required by policy. The DOD’s Manufacturing Technology Program maintains and regularly updates a “Body of Knowledge” on MRLs as “best practice,” but its uptake across the DOD is uncertain at best. See OSD Manufacturing Technology Program and Joint Service/Industry MRL Working Group, *Manufacturing Readiness Level (MRL) Deskbook*, (Washington, DC: Office of the Secretary of Defense, 2017) http://www.dodmrl.com/MRL_Deskbook_2017.pdf; for some of the historical debate about MRLs, see US Government Accountability Office, *DOD Can Achieve Better Outcomes by Standardizing the Way Manufacturing Risks Are Managed*, GAO-10-439 (Washington, DC: United States Government Accountability Office, April 2010), <https://www.gao.gov/assets/310/303512.pdf>.

45. For example, at the end of a weapon system’s initial production run, the DOD needs to decide whether to mothball production equipment to preserve the ability to reactivate production in the future. See Obaid Younossi et al., *Ending F-22A Production: Costs and Industrial Base Implications of Alternative Options*, (Santa Monica: RAND, 2010), <https://www.rand.org/pubs/monographs/MG797.html>. In other cases, DOD may decide to continue low-rate production, buying more of a system than threat- or capabilities-based planning suggests that the military requires, to prevent a production hiatus from leading to plant closures or skill atrophy that will increase the cost of developing follow-on systems. Sapolsky et al., *U.S. Defense Politics*, 133. IDA and CNA publish fewer of their studies than RAND.

46. Peter Dombrowski and Eugene Gholz, *Buying Military Transformation: Technological Innovation and the Defense Industry*, (New York: Columbia University Press, 2006), 111–35; and Harvey M. Sapolsky, Eugene Gholz, and Allen Kaufman, “Security Lessons from the Cold War,” *Foreign Affairs* 78, no. 4 (July/August 1999): 77–89, <https://www.doi.org/10.2307/20049366>.

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48. Aaron Mehta, “Here’s How the Trump Administration Plans to Increase American Weapon Sales Abroad,” *Defense News*, 8 November 2018, <https://www.defensenews.com/industry/2018/11/08/heres-how-the-trump-administration-plans-to-increase-american-weapon-sales-abroad/>.

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50. For example, Jonathan D. Caverley, “Want to Punish Saudi Arabia? Cut Off Its Weapons Supply,” *New York Times*, 12 October 2018, <https://www.nytimes.com/2018/10/12/opinion/saudi-arabia-arms-sales.html>; Jonathan Caverley, “America’s Arms Sales Policy: Security Abroad, Not Jobs at Home,” *War on the Rocks*, 6 April 2018, <https://warontherocks.com/2018/04/americas-arms-sales-policy-security-abroad-not-jobs-at-home/>; and Keith Webster, “It’s time to up It’s Time to Update U.S. Defense Export Policies,” *Defense News*, 13 August 2018, <https://www.defensenews.com/top-100/2018/08/09/its-time-to-update-us-defense-export-policies/>.

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