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Report to the Chairman, Subcommittee  
on Foreign Operations, Export Financing  
and Related Programs, Committee on  
Appropriations, House of  
Representatives

July 1993

# MILITARY AID TO EGYPT

**AD-A283 908**



## Tank Coproduction Raised Costs and May Not Meet Many Program Goals



**94-28046**



**National Security and  
International Affairs Division**

B-253412

July 27, 1993

The Honorable David R. Obey  
Chairman, Subcommittee on Foreign Operations,  
Export Financing and Related Programs  
Committee on Appropriations  
House of Representatives

Dear Mr. Chairman:

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In response to your request, we assessed the benefits and costs of the M1A1 tank coproduction program in Egypt. Our specific objectives were to (1) identify the rationale behind the U.S. decision to coproduce the tanks with Egypt, (2) compare the cost of coproduction with the cost of providing complete tanks, and (3) provide information on future plans for the Egyptian tank factory.

**Background**

As part of the Camp David Accords in 1979, the United States has provided billions of dollars in military assistance to Egypt. This assistance, provided in the form of annual grants, has remained steady at \$1.3 billion per year since 1987. Subject to U.S. approval authority, this assistance can be used by Egypt for a variety of military requirements.

In the early 1980s, Egypt decided to modernize its Army by procuring a new main battle tank. At that time, Egypt also had requirements for light armored vehicles and tank maintenance facilities. Egyptian officials studied these requirements and decided to build one large tank factory (called Factory 200) to produce the new tanks and light armored vehicles and repair M60 tanks. Egypt sought and received U.S. financial support for constructing the tank factory, and later, for coproducing M1A1 tanks there.

Although Egyptian officials told us they would like to produce 1,500 M1A1 tanks, the coproduction agreement only authorizes 524 tanks (25 complete U.S.-built tanks and 499 Egyptian-built tanks).<sup>1</sup> Six increments of production were initially planned, with Egypt progressively completing more of the tank. However, the plans for Egypt completing more of the tank in each increment have been reduced, limiting the production

<sup>1</sup>The agreement originally called for 555 tanks. This initial amount was reduced due to increased program costs.

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technologies transferred to Egypt.<sup>2</sup> As of July 1993, Egypt had just completed the first increment, which involved simply assembling tank kits from the United States. Operations at the tank factory began in 1991, and approximately 75 tanks have been produced.

Planned U.S. and Egyptian expenditures for providing the tanks, including coproduction costs and building the related factory, total about \$3.2 billion. U.S.-paid costs include \$1,881 million for the tanks and related support (consisting of \$1,634 million for the tank kits and \$247 for fielding and technical support), \$150 million to design and oversee construction of the factory, and \$460 million for coproduction support. Egyptian-paid costs include \$605 million for factory construction and equipment, and \$58 million for labor, supplies, cannon coproduction, and other costs. Most of these costs will occur between 1990 and 1998.<sup>3</sup>

On the U.S. side, the Defense Security Assistance Agency (DSAA) manages the program's budget and the U.S. Army's Security Assistance Command and Tank and Automotive Command manage coproduction details. The Office of Military Cooperation (OMC) provides overall management at the U.S. Embassy in Cairo, and the U.S. Army's coproduction field office provides detailed management at the factory. On the Egyptian side, the Ministry of Defense's Armament Authority manages the program's budget, and the Ministry of Military Production manages operations at the tank factory.

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## Results in Brief

DSAA's 1984 decision to provide \$150 million to design and oversee the construction of an Egyptian tank factory started the momentum toward Egyptian coproduction of the M1A1 tank. State Department officials currently downplay the importance of this decision, but it raised Egyptian expectations for later U.S. support for tank coproduction. Department officials stated that the 1988 decision to provide the tank coproduction program was made for important political reasons. Department officials, citing Egypt's insistence on coproduction and other factors, were convinced that Egypt would not accept complete U.S.-built tanks as a substitute, so they never considered that option seriously. If the United States had not provided the initial funding for factory design and

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<sup>2</sup>For more details on what steps the Egyptians were originally planning on taking, and revisions to those plans, see table I.1 and the narrative that follows.

<sup>3</sup>Cost estimates in this report are in current (nominal) dollars. We did not adjust these estimates for inflation because we did not have detailed information on when each type of cost would be incurred.

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construction oversight, the United States would have been in a better position to resist an Egyptian request for coproduction.

Coproducing the tanks in Egypt, as opposed to providing complete U.S.-built tanks, increased program cost from about \$1.9 billion to about \$2.7 billion (an increase of \$820 million). The additional costs were paid by both the United States and Egypt. This \$820 million in added costs could have been used to provide support equipment for the new M1A1 tanks or fulfill other Egyptian military requirements.

Egyptian officials believe the additional costs are justified by other program goals, such as economic development, modernization of their tank fleet, self-sufficiency in tank production, manufacture of light armored vehicles, expansion of arms exports, and maintenance of M60 tanks. Economic development was certainly helped by coproduction, which may create an estimated 21,950 work years in Egypt. However, we found indications that the other goals may not be achieved. Modernization of the tank fleet is hindered because Egypt is not retiring its Soviet tanks. Self-sufficiency will be limited to spare parts production because the United States is withholding critical technologies. Other technology transfers may be minimal because of changes in U.S. funding due to increased program costs. The production of light armored vehicles may never materialize because Egypt is looking at excess U.S. equipment to fulfill this requirement. The tank factory has not contributed to arms exports as Egyptian officials had hoped for. Further, maintenance of M60 tanks has yet to occur, and when it does, it will compete with other U.S. assistance.

Moreover, coproduction costs will be even higher if some of these goals are not met. For example, if other factory uses are not realized (e.g., the production of light armored vehicles and M60 tank maintenance), the factory overhead costs will have to be reallocated, and the costs of providing tanks will increase by an additional \$435 million to about \$3.2 billion. Table 1 shows the costs of providing M1A1 tanks under three scenarios.

**Table 1: Costs of Providing 524 M1A1 Tanks Under Various Scenarios**

Dollars in millions

	U.S. provides complete tanks, no coproduction	Egyptian coproduction, assuming other factory uses	Egyptian coproduction, no other factory uses
U.S.-funded costs	\$1,880.6	\$2,400.4	\$2,490.4
Egypt-funded costs	0.0	300.3	663.7
<b>Total costs</b>	<b>\$1,880.6</b>	<b>\$2,700.7</b>	<b>\$3,154.1</b>
Cost per tank	\$3.6	\$5.2	\$6.0

Anticipating an end to M1A1 coproduction in 1998, Egyptian officials are already seeking new uses for the factory, and they would like to convert part of the factory to civilian uses, potentially with U.S. assistance. Department of Defense (DOD) officials are assisting Egypt by looking for U.S. companies who are interested in working with the Egyptians at the factory. Some civilian uses of the tank factory envisioned by Egypt, such as a joint venture with Japan's Komatsu to manufacture heavy equipment, could directly compete with U.S. manufacturers.

## Views of U.S. and Egyptian Officials

At your request, we did not obtain written comments from the U.S. government agencies involved. However, we discussed a draft of this report with relevant officials from DOD (including DSAA, the Army, and OMC) and the State Department. DOD and State Department officials agreed that the coproduction program substantially raised the costs of providing M1A1 tanks. However, they stated that it is too early for us to conclude that other Egyptian goals for the factory (such as producing light armored vehicles and maintaining M60 tanks) may not be achieved. DOD officials stated that they would probably not support such a coproduction program today because the U.S. defense industrial base is declining with the end of the Cold War. However, they said that in the late-1980s, the U.S. defense industrial base was very strong and coproduction programs were not a major concern. DOD and State Department officials provided additional comments and suggestions to clarify the report, which have been incorporated where appropriate.

We also discussed a draft of this report with Egyptian officials who agreed with \$742 million of the \$820 million in additional costs that we calculated. However, they said that the tank factory would serve many purposes well into the future, so in the long-term, costs of coproduction per tank might be much lower than our estimates. For example, Egyptian officials said

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they still hope to build a total of 1,500 M1A1 tanks at the factory, so it was inappropriate for us to spread the tank factory costs (including overhead) only across the 524 M1A1 tanks currently authorized for the program. We believe that these future purposes are speculative, particularly the production of over 1,000 additional M1A1 tanks when there are no indications of U.S. approval. Therefore, we did not consider these other purposes in our cost analysis. Egyptian officials provided additional comments and suggestions to clarify the report, which have been incorporated where appropriate.

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## Scope and Methodology

To conduct this review, we met with various U.S. and Egyptian officials and examined available records and files. In Washington, D.C., we visited the State Department, DSAA, and the U.S. Army's Security Assistance Command. In Cairo, we visited the U.S. embassy and met with OMC and other post officials. We also visited Egyptian officials in Washington, D.C., and Cairo. Specifically, we met with officials from the Egyptian Procurement Office, the Armament Authority, and the Ministry of Military Production. Further, we visited the tank factory and Army Workshop 101 (a maintenance facility for M60 tanks and other armored vehicles) where we discussed operations and toured the facilities. Our work was conducted from July 1992 through June 1993 in accordance with generally accepted government auditing standards.

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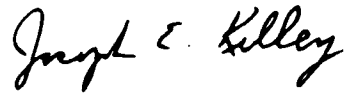
Further details on our results are provided in appendix I. Documentation of our calculations on the additional costs of coproduction are provided in appendix II.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time we will send copies to the Secretary of State; the Secretary of Defense; the Director, DSAA; the Director, Office of Management and Budget; other interested congressional committees; and selected Egyptian officials. Copies will also be made available to others upon request.

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Please contact me at (202) 512-4128 if you or your staff have any questions concerning this report. Major contributors to this report were Louis H. Zanardi, Assistant Director, and Stephen L. Caldwell, Senior Evaluator.

Sincerely yours,



Joseph E. Kelley  
Director-in-Charge  
International Affairs Issues



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## Abbreviations

DOD	Department of Defense
DSAA	Defense Security Assistance Agency
OMC	Office of Military Cooperation



# U.S.-Egyptian M1A1 Coproduction

## U.S. Funding to Build Tank Factory Started Momentum for Coproduction

In August 1984, General Dynamics and Egypt signed a \$150-million commercial contract for the design, construction management, facilitization, and start-up of an Egyptian tank factory near Cairo. In November 1984, the Defense Security Assistance Agency (DSAA) decided to finance this commercial contract with the security assistance monies that Congress had appropriated for Egypt. Because this was a commercial contract, as opposed to a government contract, the Army was not involved in contract approval.<sup>1</sup> The State Department was not involved either, other than approving the export license, because it does not scrutinize DSAA approvals on commercial contracts.

This 1984 decision started the momentum toward U.S. involvement in tank coproduction in Egypt. State Department officials said that this contract was not a factor in the later U.S. decision to approve a complete M1A1 tank coproduction program. However, Egyptian officials told us that U.S. assistance in constructing the tank factory was seen as strong U.S. support for Egypt's plan to coproduce tanks. After U.S. expenditures of \$150 million and Egyptian expenditures of \$605 million to build the tank factory, it would have been very difficult for the United States to later reject an Egyptian request for coproduction. Thus, this 1984 decision effectively closed the U.S. option of providing completely U.S.-built tanks.

In our discussions with DSAA officials and our review of DSAA files on this contract, we found no evidence that DSAA ever analyzed the implicit long-term consequences of the contract (i.e., a U.S. commitment to tank coproduction).

## Coproduction Program Approved for Political Reasons

According to State Department officials, the United States agreed to the M1A1 coproduction program with Egypt primarily for political reasons. Department officials said that in the mid-1980s high Egyptian officials had pushed very hard for the coproduction deal and saw it as an important indication of the U.S. commitment to Egypt. They said that Egypt's request came at a crucial time in the two countries' relationship because Egypt was an important U.S. ally in the Arab World and the Camp David Accords were still being implemented.<sup>2</sup>

<sup>1</sup>Egypt, in using U.S. security assistance, can either procure the items through a commercial contract with a U.S. company, or through a government-to-government contract (also known as Foreign Military Sales) with the U.S. government. In the latter cases, a U.S. military service does the actual contracting.

<sup>2</sup>While the Camp David Accords were reached in 1979, some of the implementation provisions (such as Israel's returning the Sinai Peninsula to Egypt) occurred several years later.

Department officials credited the coproduction agreement, among other factors, for the close U.S.-Egypt relationship of recent years. They added that the strength of this relationship was recently proven through close U.S.-Egyptian cooperation during the Gulf War with Iraq.

## Providing Complete Tanks Not Considered an Option

We found no evidence that the Department of Defense (DOD) or the State Department ever presented a completely U.S.-built tank option to Egypt. State Department officials told us that Egypt would only accept a coproduction arrangement and would not accept complete tanks. As a result, the Department never seriously considered providing complete tanks as an option. An internal State Department memo cited the following reasons for not proposing the complete-tank option:

- A \$2-billion tank purchase, without the benefits of coproduction, would probably create a prohibitive strain on Egypt's economic system.<sup>3</sup>
- A U.S. refusal to participate in coproduction would likely result in Egypt's seeking a tank coproduction program from another country.

However, providing complete tanks would not have created such a strain on Egypt's economy because the tanks would have been financed through U.S. security assistance grants. Although the Department indicated that coproduction would reduce the amount of scarce foreign exchange that Egypt would have to spend, our review showed that Egypt used foreign exchange to pay European companies to help build the factory.<sup>4</sup> Egypt could have saved these funds if it had sought U.S.-built tanks and not built the factory for coproduction.

Regarding Egypt seeking coproduction with another country, Egyptian officials did look at tanks from the United Kingdom, France, Germany, and Sweden before deciding on the M1A1. But while Egypt received some security assistance from two of these countries (the United Kingdom and France), this assistance was in the form of loans, not grants. Thus, Egypt would have had to forgo "free" American tanks for European tanks it would have had to pay hard currency for. Borrowing money to buy tanks from the Europeans would have exacerbated Egypt's debt problems. The

<sup>3</sup>Similarly, in July 1987, State Department officials testified before the Senate Foreign Relations Committee that Egypt could probably not afford to purchase a large quantity of M1A1 tanks from General Dynamics.

<sup>4</sup>Egypt spent \$605 million in its own funds to build the factory, including hard currency payments to European firms. However, we did not obtain data on the exact amount of hard currency paid.

U.S. governments willingness to provide billions of dollars in grants greatly reduced the chances that Egypt would buy tanks elsewhere.

## Providing Complete Tanks Would Have Met Most U.S. Goals

If Egypt had not started building the tank factory, with the 1984 U.S.-financed tank factory contract, the United States would have been in a better position to provide completely U.S.-built tanks to Egypt. For a number of years the United States had provided more than \$1 billion per year to Egypt and had approval authority over how Egypt spent the funds. Therefore, the United States had a great deal of leverage over Egypt's military procurement decisions. Given this leverage, the United States might have dissuaded Egypt from a costly tank coproduction program. At a minimum, early U.S. disapproval of funding for tank factory construction would have positioned the United States to later reject Egypt's coproduction request with fewer political repercussions.

## Achievement of U.S. Goals

As noted, the State Department said the primary U.S. goal in the coproduction program was political. However, most of the other U.S. economic and security goals for the coproduction program could have been achieved if complete tanks had been provided.

One of the other goals for the coproduction program was to foster economic development in Egypt. According to Egyptian officials, the coproduction program will add 21,950 work years to Egypt's economy over a 6-year period. This stimulus would not have occurred if the United States had provided complete tanks instead.

But some other U.S. goals for the program could have been achieved if the Egyptians had accepted complete tanks. Other U.S. goals for coproduction cited by DOD or the State Department included (1) modernizing Egypt's military capabilities, (2) promoting compatibility between U.S. and Egyptian military equipment, and (3) providing certain financial benefits to the U.S. government. These financial benefits were estimated at \$717 million,<sup>6</sup> consisting of \$138 million in procurement savings (due to larger quantity buys), \$405 million in tax revenues, and \$174 million in recouped fixed costs for research, development, and production. All of these goals could be achieved by providing complete tanks.

<sup>6</sup>The \$717 million figure was estimated based on the original quantity of 555 tanks, and not the 524 currently planned.

## Impact on U.S. Defense Industrial Base Is Unclear

Another U.S. goal of coproduction, according to DOD, was to strengthen the U.S. defense industrial base. In 1988, Army officials told us they envisioned the coproduction of "thousands" of M1A1 tanks in Egypt.<sup>6</sup> According to these officials, as U.S. Army requirements for the M1A1 would decline, the Egyptian tank program would keep the U.S. production line open. As a result, the United States would retain a highly skilled work force and a strong defense industrial base for producing tanks.

One comparison of coproduction with the option of providing complete tanks suggested that coproduction had a negative impact on the U.S. defense industrial base. This General Dynamics sponsored study<sup>7</sup> showed that coproduction would require 12,675 fewer U.S. work years, when compared with providing complete tanks.

We believe it is unclear whether coproduction had any net impact, positive or negative, on the overall U.S. defense industrial base. Coproduction was financed largely through U.S. security assistance funds, which must generally be spent in the United States. So if the United States had not provided Egypt with any tanks at all, the \$2.4 billion in U.S. grants would have probably funded Egyptian purchases of other U.S. weapon systems, such as the F-16 aircraft. A purchase of another weapon system, while not strengthening U.S. tank capabilities, would still support other parts of the U.S. defense industrial base, provide economies of scale in DOD procurements and generate U.S. jobs.

To examine the impact on the overall defense industrial base, a number of factors would be required to compare funds spent on M1A1 tanks to funds spent on any other weapon system for Egypt. First, we would need to know what U.S. weapon system the Egyptians would have sought in lieu of M1A1 tanks. Other factors include whether different weapon systems (1) incorporate important technologies, (2) generate different types and numbers of jobs, and (3) are in demand by DOD and other countries. Further, as we recently reported, DOD does not systematically maintain data on many aspects of the defense industrial base.<sup>8</sup> Without information

<sup>6</sup>We discussed the M1A1 Coproduction Program with Army officials from the Tank and Automotive Command in 1988 in preparing our report Military Coproduction, U.S. Management of Programs Worldwide (GAO/NSIAD-89-117 Mar. 22, 1989).

<sup>7</sup>This economic analysis, dated February 1988, was done for General Dynamics by Science Applications International Corporation.

<sup>8</sup>See Industrial Base: Impact of Defense Downsizing on Selected Abrams Tank Subcontractors (GAO/NSIAD-93-214, July 15, 1993).

on these factors, neither we nor DOD can determine the potential impact on the U.S. defense industrial base.

## Coproduction Added \$820 Million to the Cost of Providing Tanks

Our analysis indicates that coproduction increased the cost of providing tanks from about \$1.9 billion to about \$2.7 billion, an increase of \$820 million. Thus, coproduction increased the cost of an individual tank by \$1.6 million (from \$3.6 million to \$5.2 million). Of the \$820 million in additional costs, the United States has borne \$520 million and Egypt has borne \$300 million.

These calculations, in line with Egyptian comments, assume that 40 percent of the tank factory (including overhead cost) is devoted to M1A1 production and that 60 percent is devoted to other purposes. If these other purposes do not materialize, the cost of providing tanks would rise from about \$1.9 billion to about \$3.2 billion, an increase of about \$1.3 billion. Under this scenario, the cost of an individual tank would increase by \$2.4 million (from \$3.6 million to \$6 million).<sup>9</sup>

Both the Office of Military Cooperation (OMC) and Egyptian officials said that despite \$2.4 billion in U.S. financing for the coproduction program, Egypt still has several unfunded requirements to support the new M1A1 tanks, such as specially designed fuel trucks. If the United States had provided complete U.S.-built tanks instead of the coproduction program, Egypt would have had an additional \$820 million available to purchase needed support items to fully field the new M1A1 tanks. Alternately, the funds could have been used to fulfill other Egyptian military requirements.

## Many Egyptian Goals for Tank Factory Are in Jeopardy

Egyptian officials said the additional costs of coproduction are justified because the tank factory serves other Egyptian goals such as economic development, modernization of the tank fleet, self-sufficiency in tank production, manufacture of light armored vehicles, expansion of arms exports, and maintenance of M60 tanks. Economic development was certainly helped by coproduction, which will generate an estimated 21,950 work years in Egypt. However, other Egyptian goals for the tank factory may not be achieved. To some extent, Egyptian goals are in jeopardy because they conflict with U.S. goals.

<sup>9</sup>The costs of providing 524 tanks would increase under this scenario due to the reallocation of factory costs already incurred; no additional funds would be required.

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## Modernization of Tank Fleet

Egyptian officials have repeatedly expressed their desire to replace their Soviet tanks (T-54, T-55, and T-62 models) with U.S. tanks (M60 and M1A1 models). In addition to agreeing to provide Egypt with 524 new M1A1 tanks under the coproduction program, the United States provided Egypt 759 M60 tanks in the 1980s, 700 excess M60 tanks in 1990, and now Egypt is requesting 865 more excess M60 tanks.<sup>10</sup> While the Egyptians told us that they are retiring "some" of their oldest Soviet tanks (T-54 models), DOD and State Department officials stated that the numbers are not significant. Other factors suggest that Egypt plans to continue operating its Soviet tanks for some time. Egyptian officials acknowledged that they recently upgraded 200 T-55 tanks by fitting them with 105mm cannons. Also, according to OMC staff, Egypt has a large stockpile of T-62 spare parts that it acquired just before the break-up of the Soviet Union.

OMC officials stated that the M1A1 tanks were a major improvement over both Soviet tanks and M60 tanks. But they cited logistic problems in supporting so many types of tanks, especially the older Soviet models. The officials were concerned that fielding new M1A1 tanks, without retiring old Soviet tanks, would potentially reduce the overall effectiveness of the Egyptian Army's tank fleet.

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## Self-Sufficiency

Egyptian officials said that coproduction would make them self-sufficient in tank production. But from the program's inception Egyptian self-sufficiency was limited because, for security reasons, the United States retained control of key technology items needed to produce the tank.<sup>11</sup> The tank factory has started to produce spare parts for high-consumption items such as road wheels and tank tracks, so a small degree of self-sufficiency has been achieved.

Technology transfer (i.e., providing the Egyptians with new manufacturing technologies and skills) is an important aspect of self-sufficiency. The M1A1 coproduction program was designed around six increments of production. In most increments, Egyptian labor was expected to progressively build more and more of the tank. Table I.1 shows what major parts of production were to be performed at the Egyptian tank factory in each increment.

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<sup>10</sup>Excess tanks are U.S. tanks that are in excess of all U.S. military requirements.

<sup>11</sup>Specifically, the United States retained control of the special armor, the fire control system, and the power pack (i.e., the engine and transmission).

**Table I.1: Original Plans Called for Egypt to Produce Progressively More of the Tank**

Increment of Production	Significant part of production conducted by Egyptian labor at the tank factory
One	Hull assembly, attachment of turret, powerpack build-up, paint, and ship. All parts produced in the United States.
Two	Above, plus appurtenance welding. Some parts (road wheels and track) will be produced in Egypt.
Three	Above, plus hull machining, hull priming, painting, turret assembly, and hull race ring grinding.
Four	Above, plus hull structural welding, selected flame cutting, turret machining, turret appurtenance welding, turret priming, and painting.
Five	Above, plus hull sub-assembly welding, hull flame cutting, plus additional detailed welding.
Six	Same as above.

However, U.S. technology transfers to the Egyptians may be minimal due to changes in U.S. financing. Initial U.S. funding for technology transfer was diverted to keep the program within original budget targets. In 1992, coproduction cost estimates increased by \$311 million.<sup>12</sup> To stay within budget, Egypt and the U.S. Army made several changes in the coproduction program, including a cancellation of U.S. funding of technology transfers in increments three, four, five, and six. According to U.S. tank experts, the significant technology transfers were to occur in these increments.<sup>13</sup> Without additional funding, technology transfers will stop at increment two, and all tanks coproduced in later increments will not incorporate any additional manufacturing technologies or skills. Egyptian officials said they might fund the critical technology transfers in later increments from their own national funds. However, OMC officials told us that they did not believe that Egypt had adequate national funds available.

## Light Armored Vehicles

Initial Egyptian plans for the factory included the capability to produce up to 240 light armored vehicles per year.<sup>14</sup> Egyptian officials told us that the production of light armored vehicles is still a long-term goal. However, we found no evidence that Egypt was pursuing this endeavor at the tank

<sup>12</sup>Program costs were higher than original estimates due to poor initial cost estimates, increased production overhead, Egyptian requests for more technical assistance, and decreased economies of scale as a result of reduced U.S. Army purchases.

<sup>13</sup>Significant technologies in these increments were hull machining, precision grinding, and flame cutting.

<sup>14</sup>The specific model of such a light armored vehicle (whether indigenous or coproduced) has not been established.

factory. While Egypt has been planning the tank factory for 10 years, there are still no arrangements to produce light armored vehicles. According to OMC officials, Egypt does not have funds available (either national funds or U.S. security assistance) to finance such a production program. In addition, Egypt's recent requests for over 1,500 excess U.S. M113s (a light armored vehicle of which Egypt already has 1,000 units) is an indication that Egypt is looking at alternatives to locally produced models.

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### Egyptian Arms Exports

While Egyptian arms exports were never a U.S. goal for the program, Egyptian officials hoped that the tank factory would support Egypt's role as an arms exporter. In 1987, a high-ranking Egyptian government official declared Egypt's desire to export M1A1 tanks. And in 1988, during negotiations with the United States on the coproduction program, Egypt announced it was launching a 5-year plan aimed at increasing output, improving its technology, and capturing a sizable part of the \$20-billion annual arms market in the Middle East. Egypt saw the tank factory as a way to enhance its regional influence and earn foreign exchange.

But Egypt must have U.S. permission, which includes congressional notification, to export M1A1 tanks built through the coproduction program. As of May 1993, Egypt had yet to receive such permission. Egyptian officials told us that they would like to be involved with U.S. sales of M1A2 tanks (the updated version of the M1A1) to Saudi Arabia and Kuwait, and General Dynamics has applied for an export license to discuss M1A2 coproduction with Egypt. However, DSAA officials said that the U.S. government has rejected both Egyptian and General Dynamics requests.

Egypt also planned to use the tank factory to support its arms exports and generate hard currencies by performing tank overhauls for other countries in the region. However, as of March 1993, there had been no tank overhauls of any kind, and Egyptian officials told us that they did not have any foreign customers lined up for such work.

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### M60 Tank Maintenance

Since the initial planning in 1983, Egyptian officials saw depot level M60 tank maintenance as one of the most "urgent" reasons for building the tank factory.<sup>15</sup> State Department presentations to Congress in 1987 indicated that the Egyptians would start using the factory for M60 tank

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<sup>15</sup>Plans for M60 tank maintenance also include work on a small number of M88 recovery vehicles, which share the same engine.

maintenance and gradually develop into M1A1 tank coproduction. While Egyptian officials were able to show us definite plans for M60 tank maintenance at the factory, no such maintenance had occurred as of March 1993. Contrary to Egyptian and State Department presentations, Egypt has gone right into M1A1 coproduction before doing any M60 tank maintenance at the tank factory.

Assuming that M60 depot level maintenance commences at the tank factory, it may duplicate other U.S. assistance. According to U.S. and Egyptian officials, Egypt already has such capabilities at nearby Army Workshop 101, which has received \$74 million in U.S. funding.<sup>16</sup> While the Chairman of the tank factory indicated that Workshop 101 may not be capable of performing depot level tank maintenance, the Commander of Workshop 101 and an in-country U.S. technical expert disagreed. They stated that Workshop 101 was currently performing some depot level work on M60 tanks and could greatly expand its operations with a minimal investment for more storage space.

Because of disagreements with the Ministry of Military Production, the Egyptian Army may favor M60 tank maintenance at Army Workshop 101. As of July 1993, the tank factory had produced about 75 M1A1 tanks, but the Egyptian Army had refused to accept any of them due to a disagreement over terms of delivery. The Ministry of Military Production will charge the Army for its costs, plus a profit. After prolonged negotiations, the two sides have agreed upon a price, but they have still not agreed on the details of the warranty. Similar disputes over price and warranty may occur regarding M60 depot level maintenance at the tank factory. If this happens, the Army could favor M60 maintenance at its own Workshop 101 to avoid the profit payment and disagreements over delivery terms. This scenario could lead to underutilization of M60 maintenance capabilities at the tank factory.

OMC has requested that Egypt better plan its tank maintenance activities to minimize duplication and maximize the effectiveness of U.S. security assistance. According to OMC, Egypt's tank maintenance system consists of numerous workshops competing for maintenance and repair missions in support of both M1A1 and M60 tanks. OMC, in a letter to the Armament Authority, suggested that many of these U.S.-funded workshops are redundant and urged the Egyptians to come up with a comprehensive plan to address tank maintenance. According to OMC officials, Egypt should

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<sup>16</sup>While Army Workshop 101 has received \$74 million in U.S. funding, we could not determine how much of this funding was slated for M60 tank maintenance, as opposed to other uses.

replace its fragmented maintenance system with centralized depots that concentrate on a single type of tank (e.g., one depot for M60 tanks and one for M1A1 tanks).

## Future Use of Tank Factory Raises Issues of Defense Conversion

Once the M1A1 coproduction program ends in 1998, Egypt must address the question of defense conversion (i.e., follow-on use for the tank factory). Even during M1A1 coproduction, there is enough excess capacity at the tank factory for the manufacture of other goods. Senior Egyptian officials are already investigating various concurrent and follow-on uses for both military and civilian endeavors. For military uses, Egypt would like to use the tank factory for depot-level tank maintenance or production of tank spare parts, possibly as a subcontractor to a U.S. firm. For civilian uses, Egyptian officials have approached American firms regarding power generator turbine production (with General Electric and Westinghouse), track and road wheel production (with FMC Corporation), engine assembly (with General Motors), and heavy equipment production (with Caterpillar). Egypt has also had discussions with Japanese, German, and British firms on civilian uses for the tank factory.

To assist Egypt, DOD officials met with U.S. defense industry representatives in July 1992 to discuss follow-on uses for the tank factory.<sup>17</sup> There was some initial interest in assisting Egypt develop the tank factory for alternate uses. DOD plans further discussions with U.S. defense industry representatives.

In Cairo, OMC is exploring the use of security assistance to finance defense conversion, not just at the tank factory, but across the spectrum of Egypt's defense industry. OMC in Cairo has approached the American Chamber of Commerce (in Egypt) and the American University (in Cairo) about developing plans for defense conversion of the tank factory and other production facilities. OMC has not actively solicited or invited American defense firms to consider joint projects at the tank plant. But OMC officials said they would encourage dual-use projects (e.g., trucks and trailers) that contribute to military sustainability yet have commercial applications. While OMC has recently requested \$25,000 to conduct an in-country study on defense conversion, DSAA has denied the request.

Many aspects of defense conversion would be consistent with U.S. interests. If U.S. firms participated in defense conversion, a partnership

<sup>17</sup>The DOD officials were from the Office of the Under Secretary of Defense for Acquisitions, International Programs Section.

with Egypt could enhance their access to Middle Eastern markets. Defense conversion could also contribute to the U.S. goal of economic growth in Egypt. According to OMC, economic development, and thus increased employment, would enhance regional stability by countering current social unrest in Egypt.

Nevertheless, there are economic and political challenges to using security assistance to fund defense conversion. U.S. industry representatives have shown concern that new uses for the tank factory may compete against them, and the prospect of U.S. security assistance subsidizing competitors to U.S. industry (as outlined below) would justifiably raise political concerns in Congress.<sup>18</sup>

Further, there may be legal and administrative challenges. The DSAA legal counsel told us that the Foreign Military Financing Program (the current mode of financing for M1A1 coproduction) must be used for military purposes, so defense conversion would not qualify. He stated that the Arms Export Control Act would have to be amended to use Foreign Military Financing for strictly nonmilitary purposes. However, based on our discussion with the DSAA legal counsel and our legal analysis, security assistance funds might be used for defense conversion if Egypt's military operates the tank plant to benefit the country's economic and social development. In addition, Economic Support Funds might be used for defense conversion to nonmilitary purposes. However, Economic Support Funds are not managed by DSAA; they are managed by the U.S. Agency for International Development. In Cairo, the Deputy Director of the Agency for International Development mission told us that his office was reducing staff and would have difficulty managing a major new program in Egypt.

On a positive note, DOD efforts could be successful to help arrange for a U.S. firm to provide private capital for a joint venture with Egypt. The joint venture could lead to the production of items that would not compete with items produced in the United States. According to OMC officials, this could happen if U.S. firms had previously been unable to penetrate the Middle East market with such products but were able to do so with Egyptian assistance. Ideally, there would still be some level of production in the United States, with additional assembly or finishing performed in Egypt.

Alternately, if no U.S. firm was interested in a joint venture, the tank factory could lie idle in the desert. Or, a foreign firm could use the factory,

<sup>18</sup>Congress has shown its opposition to such activities in the past through legislation. Provisions in Foreign Assistance Appropriation Acts have restricted funding for certain activities that could compete with American manufacturers or workers.

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including the equipment already funded by the United States. If ongoing discussions between Egypt and Komatsu (a Japanese firm) result in the production of heavy equipment at the tank factory, this could compete directly with U.S. manufacturers, such as Caterpillar.

# Additional Costs of M1A1 Coproduction

This appendix documents our calculations on the additional costs of M1A1 coproduction in Egypt compared with providing completely U.S.-built tanks. These calculations do not include \$1,634 million for the costs of the tank kits because there is no significant cost difference between a complete M1A1 tank and a tank kit. We also do not include \$247 million for fielding support and technical data that would be needed to support the M1A1 tanks whether they were coproduced or provided complete.

These calculations are based on data supplied by U.S. officials (for U.S. costs) and Egyptian officials (for Egyptian costs). U.S. and Egyptian officials reviewed our calculations, and their comments were incorporated where appropriate. Table II.1 below provides a summary of the additional costs under two scenarios. The first scenario assumes that Egyptian officials use the tank factory for other uses such as producing light armored vehicles or maintaining M60 tanks. The second scenario assumes that these other uses never materialize.

**Table II.1: Additional Costs of Coproduction**

Dollars in Millions		
Type of cost	Assuming other factory uses	Assuming no other factory uses
<b>U.S.-funded costs</b>		
Technical assistance	\$236.0	\$236.0
Factory facilitization	105.9	105.9
Cannon coproduction	99.8	99.8
Factory design and construction oversight	60.0	150.0
Coproduction management	18.2	18.2
<b>Subtotal</b>	<b>519.9</b>	<b>609.9</b>
<b>Egyptian-funded costs</b>		
Capital costs	242.0	605.0
Parts and supplies	23.4	23.4
Profit for Ministry of Military Production	19.7	19.7
Labor costs	8.3	8.3
Cannon coproduction	6.9	6.9
<b>Subtotal</b>	<b>300.3</b>	<b>663.3</b>
<b>Total</b>	<b>\$820.2</b>	<b>\$1,273.2</b>

## Additional U.S. Costs

In our calculations, we only included costs uniquely related to coproduction that would not have been incurred had Egypt purchased complete U.S.-built tanks. Such additional U.S.-funded costs, part of the Foreign Military Financing Program, total \$519.9 million. This figure comprises \$236 million for technical assistance, \$105.9 million for factory facilitization, \$99.8 million for cannon coproduction, \$60 million for factory design and construction oversight, and \$18.2 million for coproduction management. Of the \$519.9 million in additional U.S. costs that we calculated, U.S. officials agreed with \$459.9 million and Egyptian officials agreed with \$441.7 million.

If Egypt does not use the tank factory for other purposes (e.g., to produce light armored vehicles and perform M60 tank maintenance), the overhead costs of factory design and construction oversight will rise to \$150 million and total U.S. costs applied to M1A1 coproduction will rise to \$609.9 million. These are sunk costs at this point, and no new funding will be required.

Details on each of these costs follow:

**Technical Assistance:** \$236 million for manufacturing technical assistance provided through the foreign military sales program. U.S. and Egyptian officials agreed that this figure was an additional cost of coproduction.

**Factory Facilitization:** \$105.9 million to set up the factory for manufacturing. U.S. and Egyptian officials agreed that this figure was an additional cost of coproduction.

**Cannon Coproduction:** \$99.8 million for 120mm cannon coproduction. U.S. and Egyptian officials agreed that this figure was an additional cost of coproduction.

**Factory Design and Construction Oversight:** \$60 million of the \$150-million commercial contract for factory design and construction oversight. DOD officials said they had no comment because they do not monitor such commercial contracts.<sup>1</sup> Egyptian and State Department officials stated that none of the \$150-million contract related to M1A1 coproduction because Egypt had not selected the M1A1 when the contract was awarded. They said that the factory was for producing a "main battle tank" as well as producing light armored vehicles and performing M60 tank maintenance.

<sup>1</sup>While this commercial contract was approved by U.S. officials in DSAA, all monitoring of the contract is done by Egyptian officials.

However, the contract clearly shows that one of its purposes was to help build an Egyptian tank factory capable of manufacturing 100 "M1 type" main battle tanks per year. We confirmed this with a representative of the contractor, General Dynamics. Whether the tank was the M1A1 or a generic "main battle tank" at the time of the contract is not the issue. Since Egyptian officials told us that 40 percent of the capital costs of the tank factory can be attributed to M1A1 coproduction, we used \$60 million (0.40 X \$150 million) as an additional cost of coproduction. If the tank factory does not realize its other purposes (i.e., producing light armored vehicles and performing M60 maintenance), the entire \$150-million cost of this contract should be attributed to M1A1 coproduction.

Coproduction Management: \$18.2 million to operate the coproduction management office. Egyptian officials said that none of these costs were related to coproduction; rather, they were only related to fielding the tanks. This is contrary to our discussions with staff from the U.S. coproduction field office in Cairo, who showed us that fielding support costs are covered in a separate \$244-million foreign military sales contract.

## Additional Egyptian Costs

Egyptian additional costs of coproduction total \$300.3 million. This figure comprises \$242 million in capital costs, \$23.4 million in parts and supplies, \$19.7 million in profits for the Ministry of Military production, \$8.3 million in labor, and \$6.9 million for 120mm cannon coproduction. These figures were all provided by Egyptian officials. U.S. officials had no comments on Egyptian costs, except where noted. This total may be conservative because, according to Egyptian officials, labor and supply costs could rise in later production increments if all technology transfers eventually occur. In a worse case scenario, the tank factory will not be used for anything else (e.g., light armored vehicle production and M60 tank maintenance) and the entire \$605 million in capital cost would be allocated to M1A1 coproduction. This would raise total Egyptian costs to \$663.3 million.

Details on each of these costs follow:

Capital Costs: \$242 million. Egypt expended \$605 million in capital costs for the tank factory. This cost is broken down into \$335 million for construction and utilities, \$220 million for machines and equipment, \$22 million for tools, \$21 million for material handling equipment, and \$7 million for furniture. Egyptian officials said not all of these costs should be allocated to the tank program because the tank factory potentially serves other purposes. According to Egyptian officials, only 40 percent of

these capital costs can be associated with M1A1 coproduction. Therefore, Egypt incurred \$242 million (0.40 X \$605 million) as an additional cost of coproduction. If the tank factory's other stated purposes (light armored vehicle production and M60 tank maintenance) fail to materialize, the entire \$605 million in capital cost should be allocated to M1A1 coproduction.

Parts and Supplies: \$23.4 million. Egyptian costs for parts and supplies (e.g., expended tools, lubricants, etc.) will be LE<sup>2</sup> 154,921 per tank (or \$46,946). Multiplying this figure by 499 coproduced tanks totals \$23,426,054. This estimate only covers increments one and two, so it only applies to the first 175 of the 499 tanks to be coproduced. The factory chairman told us that parts and supply costs would increase considerably in later increments of production, assuming successful implementation of all technology transfers. However, he did not have a figure available for later increments.

Profits for Ministry of Military Production: \$19.7 million. Egyptian cost for profit for the Ministry of Military Production is LE 130,156 per tank (or \$39,441). Multiplying this figure by 499 coproduced tanks provides a total of \$19,681,059. According to the tank factory chairman, profit payments will increase in the more costly later increments, assuming successful implementation of all technology transfers. State Department officials said that these profits were not a real cost; they only represented an internal transfer of funds within the Egyptian government. However, as evidenced by the prolonged price negotiations between the Egyptian Army and the Ministry of Military Production, as well as our discussions with Egyptian officials, the Army considers this a very real item in its procurement budget.

Labor Costs: \$8.3 million. Egyptian labor cost is expected to be LE 55,104 per tank (or \$16,698). Multiplying this figure by 499 coproduced tanks totals \$8,332,302. Again, the factory chairman told us that labor costs could rise considerably in later increments, assuming all technology transfers, but he did not know what the higher costs would be.

120mm Cannons: \$6.9 million. After increments one and two (the first 175 tanks) Egypt will coproduce the 120mm cannon for increments three through six (the remaining 324 tanks). Egyptian officials told us that their costs for cannon coproduction (the price the Ministry of Military

<sup>2</sup>LE is the symbol for Egypt's currency, the Egyptian pound. We used an exchange rate of \$1 = LE 3.3 to convert the Egyptian costs into dollar equivalents. This was the prevalent exchange rate when we finalized our report in June 1993.

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**Appendix II**  
**Additional Costs of M1A1 Coproduction**

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Production will charge the Egyptian Army) will be LE 70,000 per tank (or \$21,212). Multiplying this figure by 324 tanks totals \$6,872,688. Egyptian officials did not give us a breakdown on cannon costs with respect to capital, labor, supplies and profits.