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Israel and the Iron Dome System: A Lesson for the United States

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Since Israel deployed its new Iron Dome artillery and rocket interceptor system in April, it successfully used it to shoot down Hamas Grad rockets. The Israeli experience with Iron Dome shows that the criterion of cost effectiveness for missile defenses has been defined too narrowly in the United States.

More to the Story. The missile defense cost-effectiveness debate began following President Reagan's 1983 announcement of the Strategic Defense Initiative, after which President Reagan's Senior Advisor Paul Nitze established three criteria for determining the merits of moving to the deployment of ballistic missile defense systems. One of them was that the missile defense system had to be cost effective at the margin. This was defined to mean that it would have to produce a defensive interceptor at less cost than for the enemy to produce an additional offensive ballistic missile.

While the Nitze criteria for the U.S. missile defense program remain relevant, Israel's experience with the deployment and use of the Iron Dome system has a very important implication for how the U.S. should consider the question of the cost effectiveness of missile defense systems it has deployed in the past and continues to develop.

Each Iron Dome Tamir interceptor costs more than \$100,000 to produce. This is many times the cost for Hamas or Hezbollah to produce the Grad, Qassam, Katyusha-style, and other rockets. But there is more to assessing the cost effectiveness of a defensive system such as Iron Dome than a simple calculation of the cost of an additional defensive

interceptor compared to the cost of an additional offensive rocket to Hamas or Hezbollah. Specifically, this calculation leaves out four essential considerations, which increase the relative cost effectiveness of the defensive systems.

- **The value of what is being defended.** Until the deployment and use of Iron Dome, Hamas found great advantage in launching rockets at Israel precisely because it knew that with these "free shots" they could jeopardize targets that are far more valuable than the rockets used in the attacks. Likewise, the Israelis will find that the value of what they are defending far exceeds the cost of the more expensive Tamir interceptors.
- **"Force on force" comparisons of offensive and defensive systems.** The Iron Dome system has the capability to determine the trajectory of incoming rockets with sufficient precision to permit an informed judgment by its operators that many of the attacking rockets are headed toward areas where there is nothing of value to defend and not launch an interceptor against it. In April, the Israelis found that they needed to launch an interceptor against only about 20 percent of the rockets launched by Hamas. Accordingly, until

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Hamas deploys more accurate rockets, it will have to launch about five times as many rockets before Israel's Iron Dome is fully utilized.

- **The cost of escalation.** Defensive systems can serve to establish breaks in the escalation ladder. Until the deployment of the Iron Dome system, the Israelis faced a stark choice: They could absorb the attacks or escalate the conflict by conducting retaliatory offensive operations against their enemies. Escalation, for justifiable reasons, is what the Israelis chose to do both against Hezbollah in 2006 and against Hamas periodically. To the extent the Israelis used these retaliatory strikes in attempts to destroy enemy rocket launchers—itsself a fundamentally defensive purpose—they found the offensive counterstrikes themselves to have limited effectiveness and cost effectiveness. The Iron Dome system provides the Israeli leadership with the political, policy, and military options as well as the space and the time to make the right decision in order to prevent an escalation.
- **Intangible elements in the assessment of cost effectiveness.** Calculating the political advantage derived from the application of military power depends as much on the intangibles of human behavior as on the precise calculations of quantifiable costs and benefits. The Israelis are likely to find that the deployment and use of the Iron Dome system increases the chance that they will break the will of their enemies and that these enemies will come to accept a genuine peace. Even short of the ideal outcome of a genuine peace, there are important intangible considerations. Its use of the Iron Dome system, for

example, permits Israel to draw an even clearer distinction between itself and its enemies as to which side is the aggressor (not that there should be much doubt by anyone making an honest assessment). Nevertheless, there is considerable, albeit intangible, value in depriving an enemy of plausible arguments against an effective military system. For Hamas and Hezbollah to argue against Iron Dome, they will have to assert that Israeli use of this defensive system is an aggressive measure. The argument is implausible.

Not a Simple Calculation. On the basis of the Israeli experience with Iron Dome, the U.S. should revise the Nitze criteria's provision for calculating the cost effectiveness of missile defenses. This is not to say that it is appropriate to dismiss the need for a cost-effectiveness criterion. Nor does it follow that defensive systems will be found more cost effective than offensive systems in every instance. There are inherent advantages in offensive systems under many circumstances.

Political and military leaders should understand that calculating the relative cost effectiveness of offensive and defensive systems is an elaborate undertaking and cannot depend on the kind of simple calculation that Paul Nitze asserted in his cost-effectiveness criterion for missile defense systems.

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