

Indian Missile Defence Development: Implications for Deterrence Stability in South Asia

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Abstract

India has pursued the development and acquisition of a ballistic missile defence (BMD) system since the 1990s. Its indigenous system consists of a two-tier system that aims at intercepting ballistic missiles at higher and lower altitudes. It has also tried to acquire BMD systems or components from the US, Russia and Israel over the years. The development of ballistic missile defence by India challenges the very basis of deterrence. The concept of deterrence is based on mutual vulnerability. Ballistic missile defence disturbs deterrence by at least theoretically providing the Indian side protection against incoming ballistic missiles. Even though missile defence is not completely foolproof, it is costly, and at the moment only provides limited cover. Still it provides a false sense of security to the Indian leadership, making them act with belligerence in a crisis. Thus, it increases instability and deepens Pakistan's security dilemma vis-à-vis India. The paper argues that BMD erodes the credibility of Pakistan's nuclear deterrent. It also increases the balance of resolve in India's favour in any crisis, whereby it is willing to take higher risk knowing that it would have protection from BMD if events spiral out of control. It leaves Pakistan open to Indian aggression, coercion, and even intervention. It also encourages preemption. Pakistan's best option to counter the instability introduced by missile defence is to pursue a mix of qualitative and quantitative enhancements to its nuclear and missile forces.

Keywords: Ballistic missile defence; deterrence instability; balance of resolve; pre-emption; arms racing; counter measures

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Introduction

India has pursued development and acquisition of a ballistic missile defence (BMD) system since the 1990s. Its indigenous system consists of a two-tier system that aims at intercepting ballistic missiles at higher and lower altitudes. Reportedly, the first phase of the BMD became operational in 2012, and the second will become operational in 2016, which aims at protecting two Indian cities - Delhi and Mumbai - initially. India has also tried to acquire BMD systems or components from the US, Russia, and Israel over the years. The development of ballistic missile defence by India challenges the very basis of deterrence. The concept of deterrence is based on mutual vulnerability. Ballistic missile defence disturbs deterrence by at least theoretically providing the Indian side protection against incoming ballistic missiles.¹ Even though missile defence is not completely foolproof, it is costly, and at the moment only provides limited cover. It provides a false sense of security to the Indian leadership, making them act with belligerence in a crisis, and encourages pre-emptive tendencies. It, thus, increases instability and deepens Pakistan's security dilemma vis-à-vis India. In a region that has seen four wars, and where the nuclear-armed adversaries (India and Pakistan) have come eyeball-to-eyeball on several occasions, the development of the BMD is likely to destabilise a fragile deterrence equation. Therefore, it is imperative to assess the security implications of the Indian BMD. This paper aims to assess the development of BMD by India, its implications for deterrence stability in South Asia, impact on Pakistan's security, and possible counter-measures and policy options that the latter can pursue.

The literature on the issue is broadly divided into two schools on whether BMD is destabilising or not. The first argues that missile defence, whether the US or Indian, is detrimental for deterrence and strategic stability.² These scholars have a mix of arguments from the cascading effect of BMD,³ whereby states would react to missile defence acquisition by a rival by acquiring systems of their own or going for counter-measures, to the dangers of arms racing and preemption, arguing that it disturbs the very basis of deterrence by making one side invulnerable to missile attacks. Others argue that the BMD would not have any negative impact on deterrence or strategic stability;⁴ indeed it would be stabilizing since it provides assurance against rogue states and

accidental missile launches. This is essentially the argument that American scholars developed in order to support the US BMD. Indian scholars have gone as far as arguing that BMD is a doctrinal imperative for India, not a luxury.⁵ They argue that it is necessary for maintaining strategic balance rather than upsetting it by bringing about a defensive transition in strategic forces that could lead to a safer nuclear world.⁶

The present study argues that the Indian BMD would be destabilising for deterrence and strategic stability. It essentially argues that BMD affects the credibility of Pakistan's nuclear deterrence. It uses Robert Powell's balance of resolve theory⁷ and applies it to India and Pakistan's case to argue that BMD makes India more resolute in a crisis, leaving Pakistan open to coercion and vulnerable to intervention. In this manner, the paper makes a contribution to the existing literature since Powell's theory has not been applied to South Asia yet.

The paper has three sections. Section one looks at the pursuit of missile defence options by India. It briefly looks at India's efforts to acquire BMD and components over the years, and its efforts to develop an indigenous system in more detail. The second section looks at how the introduction of BMD will affect deterrence stability in particular, and Pakistan's security in general. The third section looks at possible counter-measures and options that Pakistan can pursue in order to counter the instability.

Theoretical Framework

The overall theoretical framework of the study comes from the realist tradition. Within the realist paradigm, the paper takes guidance from the rational deterrence theory,⁸ and Robert Powell's dynamics of brinkmanship and subsequent balance of resolve theory. The rational deterrence theory sees deterrence as a function of capability and credibility, which essentially means: Deterrence = Capability x Credibility. The introduction of missile defence by India basically disturbs the credibility of Pakistan's nuclear deterrent. The realist tradition also postulates, through its offence-defence theory, that peace is maintained through a delicate balance of offence and defence.⁹ Stephen Van Evera argues that war is more likely if victory is cheap.¹⁰ This theory

is also relevant to South Asian nuclear deterrence equations since a BMD may give India the feeling that it can launch an offensive (conventionally or otherwise) on Pakistan without the fear of being vulnerable to a counter-attack.

Robert Powell argues that crises between nuclear-armed states become a kind of brinkmanship since neither can credibly threaten to destroy the other as both states run the risk of being annihilated. During a crisis, states exert pressure on each other with the chances that the confrontation will end in a nuclear exchange. These are terrible choices that states face where they can hang on a little longer and accept greater risk, in the hope that the other adversary will find the risk too high and back down.¹¹ Brinkmanship is thus a contest of resolve where states bid up the risk of events spiraling out of control until one state finds the risk too high and backs down. Crises and conflicts are fundamentally linked to balance of resolve. Crises arise only when there is uncertainty about the balance of resolve.¹²

This model is relevant and applicable in the case of South Asia, since in any crisis possession of BMD increases the resolve of India. In any crisis between India and Pakistan, India would have greater resolve, and be willing to take greater risks knowing that if events lead to a nuclear exchange, it would run a lesser risk of being hit while protected by BMD.

The paper employs the single case study method. The paper envisages BMD as the independent variable and deterrence stability as the dependent variable. It seeks to assess the effects of BMD on deterrence stability using assumption of rational deterrence theory and balance of resolve theory. It relies on primary sources like official documents and statements, as well as secondary sources like newspapers, journal articles, books and reports. The present study also relies on elite interviews from Pakistani experts on South Asian security in general and nuclear deterrence in particular.

India's Pursuit of Missile Defence

India has pursued a missile defence option for over two decades now. It has taken two avenues – one to acquire missile defence systems and

*Indian Missile Defence Development: Implications for
Deterrence Stability in South Asia*

components from abroad, and secondly to develop an indigenous system. This section will examine these two avenues as well as examine the broader reasons for India's pursuit of BMD.

India almost took a policy U-turn when it chose to support and endorse the US announcement to pursue extensive missile defence in May 2001. Indian support to the US and its subsequent development of BMD had wider policy connotations. This was the beginning of the Indo-US strategic partnership with the expectations of civil nuclear cooperation and military technology transfers. The pursuit of BMD is also a part of India's grand strategy, where it has aspirations to become a global power. Over the years, India has pursued acquisition and development of BMD systems.

India's efforts to acquire BMD systems have revolved around variants of Russian S-300, the Israeli Arrow system, and the US Patriot Advanced Capability-3 (PAC-3) systems. Reportedly, in 1995-6 India negotiated a \$1b deal with Russia to acquire six S-300 systems, with each system consisting of 48 missiles.¹³ According to other reports, India has also acquired ABM Antey module from Russia.¹⁴ This system is capable of engaging 8 Intermediate Range Ballistic Missiles (IRBMs) from a distance of 2500km or 16 Theatre Ballistic Missiles (TBMs) from 3000 km away.¹⁵ India has also long been keen to acquire the Arrow theatre missile defence system from Israel. The Arrow-2 version can intercept upto 14 short- and medium- range ballistic missiles simultaneously launched from 500km away.¹⁶ However, the system was jointly developed by Israel and the US and needs US approval for the sale, which the US has not given to date. India has managed to purchase a component of Arrow, 2-3 Green Pine radars in early 2000s. The Green Pine radar is an electronically scanned, solid state, phased array radar that can detect multiple targets simultaneously of up to ranges of 500km.¹⁷ The deployment of the Green Pine radar along India-Pakistan border potentially provides India strategic advantage by giving it tracking and surveillance deep into Pakistani territory. India has also acquired three Phalcon Airborne Early Warning Command and Control Systems (AWACS) in 2009-10 and signed up to acquire another two systems.¹⁸ The Phalcon AWACS, Green Pine radar, combined with acquired and indigenous missile defence systems give India great surveillance,

detection and interception capabilities against Pakistani ballistic missiles and aircraft. India has also expressed interest in the US Patriot Advanced Capability (PAC-2) and PAC-3 missile defence systems. With the picking up of India-US relations in 2005 with the two declaring an Indo-US Strategic Partnership, the US reportedly cleared the sale of the PAC-3 system to India.¹⁹ However, there has been no further development to indicate that the sale of PAC-3 has gone through.

India has simultaneously been developing an indigenous BMD system and has made significant progress in the last decade or so. It is a two-tier system designed to destroy incoming ballistic missiles. It comprises two systems – the Prithvi Air Defence (PAD) for high altitude (exo-atmospheric interception) and Advanced Air Defence (AAD) for low altitude or endo-atmospheric interception. The PAD is designed to intercept missiles at 80-120km while AAD, which consists of Akash surface to air missile, is designed to intercept at altitudes of 15-30km.²⁰ The former is a mid-course interception while the latter is terminal stage interception. Missile defence is a two-phase plan where AAD and PAD represent the first phase. In 2012, Indian Defence Research and Development Organisation (DRDO) Chief V.K. Saraswat announced that the first phase was complete in 2012: “The ballistic missile defence shield is now mature... We are ready to put phase-I in place....”. He also claimed that the system was ready to protect two Indian cities.²¹ The two chosen cities for the defence shield are Delhi and Mumbai.²² The second phase is due to become operational in 2016. In the second phase the DRDO plans to develop two new ballistic missiles, the AD-1 and AD-2 which would be able to intercept IRBMs and Intercontinental ballistic missiles (ICBMs).²³

The Indian BMD system relies on its swordfish radar system for tracking and guidance. Swordfish is an acknowledged derivative of the Green Pine Radars that India has acquired from Israel.²⁴ Swordfish guides the exo-atmospheric missile PAD to engage aerial targets at altitudes over 80km. It is capable of simultaneously tracking more than 200 objects at a range of 600-800 km. The DRDO has plans to extend the range of swordfish radars to 1500 km.²⁵ The deployment of these radars means they can detect most objects and missiles within almost the entire Pakistani territory.

*Indian Missile Defence Development: Implications for
Deterrence Stability in South Asia*

In the short-to-medium term, Indian missile defence plans seem set to counter short- and medium- range ballistic missiles, with plans to protect two Indian cities initially. Its long terms plans are more ambitious – to protect against incoming IRBMs and ICBMs. The system is limited at the moment but it can be expected to become more accurate and extensive in the coming decades. India can also deploy a layered defence system using a mix of indigenous and acquired systems. The indigenous system alone, once effective and deployed, could counter Pakistan’s Hatf, Ghauri and Shaheen series ballistic missiles, thus affecting Pakistan’s nuclear deterrent. However, as the scope and effectiveness of Indian BMD increases it would have a major impact on Pakistan’s nuclear deterrent.

**Implication for Nuclear Deterrence and Strategic Stability in
South Asia**

This section examines the effect of Indian BMD on deterrence stability in South Asia, particularly its implications for Pakistan. It uses the rational deterrence theory and brinkmanship theory (during a crisis between two nuclear-armed states) to assess the impact of BMD on Pakistan’s nuclear deterrent.

The rational deterrence theory²⁶ essentially argues that to deter nuclear attacks, a state has to persuade its adversary that it has effective military capability, that it can inflict unacceptable damage, and that it has the will to carry out the threat.²⁷ Capability means having the nuclear weapons and delivery systems to carry out the threat, and credibility means communicating the threat to the adversary as well as how credible the latter perceives the threat. Rational deterrence is, therefore, a function of capability and credibility or: $Deterrence = Capability \times Credibility$.

An Indian BMD affects the credibility of Pakistan’s nuclear deterrent. The notion of nuclear deterrence rests on mutual vulnerability of both sides to attack. By developing and deploying missile defence systems, India can essentially protect against an attack by Pakistani ballistic missiles. It thus becomes at least theoretically invulnerable to Pakistan’s ballistic missile attack. Using the formulation $Deterrence = Capability \times Credibility$, it means that while Pakistan’s nuclear capability remains intact, its credibility could be eroded if Pakistan does not take matching

steps. It consequently means that deterrence is also affected. With a missile defence system in place, India would be more confident in considering a nuclear attack knowing that it would be relatively protected if Pakistan goes for a counter-strike. India claims that its missile defence shield is ready to protect two cities, but it has plans to develop a much more extensive system. Overall, it destabilises deterrence, if not leaving it null and void.

The brinkmanship and balance of resolve theory is also applicable to the deterrence equation in South Asia. BMD essentially makes a state more resolute in a crisis between two nuclear-armed adversaries. State A with BMD becomes more likely to oppose its nuclear-armed adversary state B, and more willing to tolerate the risk that the crisis will spiral out of control. State B, on the other hand, is more likely to back down and less willing to risk escalation.²⁸ The resolve of state A increases as its BMD becomes more effective. But so does the uncertainty regarding the balance of resolve with greater chances that events will spiral out of control. The reasoning, thus, is that BMD increases the resolve of a state by reducing the costs if events get out of hand.²⁹

This model is relevant to the South Asian nuclear equation. Possession of BMD increases the effective resolve of India. In any crisis between India and Pakistan, India would be willing to take greater risks of being attacked in order to prevail knowing that if events lead to a nuclear exchange, it would be protected by BMD. Indeed the better Indian BMD would work, the more resolute it could become. In fact, as the BMD becomes more effective, India's threshold of attack on Pakistan would decrease, resulting in greater likelihood of attack and intervention.³⁰ In essence, India would hope that Pakistan would have to back down in most crises. It also leaves Pakistan open to an attack by India. This threatens to erode the credibility of Pakistan's nuclear deterrent, and makes it vulnerable to coercion and intervention.

The induction of BMD in South Asia is destabilising and imperils credibility of Pakistan's nuclear deterrent. This has a number of implications. The first implication is that BMD is also destabilising because it may encourage preemption by both adversaries. In theory, how the logic of preemption works in the presence of BMD is that if it is

*Indian Missile Defence Development: Implications for
Deterrence Stability in South Asia*

capable of hitting and killing 90 percent of incoming missiles, for example, then it may encourage the Indian side to launch a pre-emptive strike in order to destroy as many Pakistani missiles as possible. BMD thus provides temptation to the possessor state to launch a strike before the other side can do so, in the hope that the remaining missiles can be dealt with through BMD.³¹ Zahir Kazmi also draws the linkage that India's pursuit of BMD would destabilise the region, asserting that: "Even a basic BMD capability may encourage a first strike and pre-emptory tendency in Indian thinking."³² He further suggests that this would affect the minimum deterrence levels. Another analysis also endorses this view: "the minimum deterrence levels currently exhibited could quickly disappear as the two sides enter a tit-for-tat upgrading system... (India) could adopt a more aggressive posture...and even pre-emption against Pakistani nuclear assets."³³ Ganguly and Kapur essentially endorse the view that Indian BMD is destabilising. They argue that "BMD would achieve much the same strategic result as counterforce nuclear weapons, preventing a state effectively using its nuclear forces to retaliate against its adversary."³⁴ This could create first-strike incentives by Pakistan as well. If it were feared that India was contemplating an attack on its nuclear forces and command and control, and it also possesses BMD, Pakistan would be tempted to launch a strike first. This essentially means that minimum deterrence levels would be further lowered as Pakistan and India's nuclear thresholds decrease. In fact, with the danger of preemption from either side, the nuclear thresholds disappear. This is still the worst case scenario but one that cannot be completely ruled out in South Asia.

This leads to a related point whereby some experts have argued that BMD system would not really affect Pakistan's operational deterrent capability since a BMD is not effective against cruise missiles, and only marginally effective against ballistic missiles armed with counter-measures. Pakistan has diversified its delivery systems in recent years and has gone for development of Babur cruise missile which can easily evade BMD systems. Pakistan is also pursuing other qualitative and quantitative improvements to its nuclear deterrent. Therefore, Indian BMD system would not have a major effect on Pakistan's operational deterrence capability at present. But at the same time it fuels an arms race whereby Pakistan has to pursue counter-measures. Also, India's pursuit

of BMD has heightened Pakistan's threat perceptions and intensified its security dilemma vis-à-vis India. However, the real danger is that even if India's BMD does not provide extensive coverage at present, and even if it is not highly effective, it would produce a false sense of security,³⁵ making the Indian political and military elite act with much more aggression in a crisis. Take the case of 2001 terrorist attacks on the Indian parliament for which India wrongly blamed Pakistan, and subsequently had a massive military build-up on the Pakistani border. Indian coercive diplomacy of going up the escalation ladder just short of war failed, but created a highly unstable situation. The comfort zone of a BMD is likely to increase such misadventures.³⁶ In sum, it increases the effective resolve of India to prevail in a crisis, even risking escalation to a nuclear exchange. This also creates space for India to pursue a limited war at its whim. It would, thereby, be detrimental for strategic stability and nuclear deterrence. Pakistan has time and again raised concerns that it considers India's on-going efforts to build ballistic missile system as a destabilising development. Pakistan Foreign Office spokesman in May 2013 said that Pakistan had constantly drawn attention of the Indian Government to this issue through composite dialogue process.³⁷ However, India has not responded positively to Pakistan's concerns over its ongoing efforts to build a BMD.

A missile defence system is also destabilising for South Asia since Pakistan may change its nuclear posture as a response. Presently, Pakistan has a doctrine of credible minimum deterrence with de-alerted nuclear force and de-mated non-deployed warhead status. Pakistan may change this posture and mate its warheads with the delivery systems, and overall have its nuclear forces on a higher state of alert.³⁸ In such a scenario, the risk of inadvertent use of nuclear weapons also increases. A nuclear force on higher alert is thus destabilising for a conflict-prone theatre like South Asia.

A BMD is also destabilising because it triggers another arms race in South Asia. As the introduction of BMD heightens Pakistan's threat perceptions, Pakistan is sure to respond in some way by bringing qualitative and quantitative changes to its nuclear forces and its ballistic missiles. The next section discusses possible counter-measures and Pakistan's policy options in detail.

Pakistan's Countermeasures and Policy Options

Given that an Indian BMD erodes the credibility of Pakistan's nuclear deterrent and heightens its threat perceptions, it is sure to respond in some ways. Pakistan can either opt for a missile defence system of its own, or build up its offensive nuclear forces in order to overwhelm and defeat Indian missile defence systems.

Pakistan's prospects for producing its own missile defence system are extremely limited from a technological and financial point of view. Pakistan is unlikely to acquire BMD systems from Russia or the US, as its growing relations with Russia have not reached that threshold, and its relations with the US though stable at the moment do not promise possible negotiations on provision of missile defence systems like the PAC-3. This essentially leaves China as Pakistan's only possible option for acquiring BMD systems. China has developed BMD systems of its own over the years. Pakistan and China have a long history of friendly bilateral relations and defence cooperation, under which it is feasible that the latter would be willing to sell the systems to Pakistan. However, the costs of such systems are exorbitant

The easiest and more cost-effective option for Pakistan would be to go for a qualitative and quantitative enhancement to its nuclear and missile forces. The simplest option would be to go for a larger number of nuclear warheads and ballistic missiles. Pakistan can also pursue Multiple Independently Targetable Re-entry Vehicles (MIRVs), whereby a single missile is armed with multiple warheads. This is perhaps why an early conclusion of a Fissile Material Cut-Off Treaty (FMCT) would not protect Pakistan's security interests.³⁹ The purpose of a quantitative enhancement in nuclear and missile forces would be to saturate and overwhelm an Indian BMD. This would mean that if Indian BMD has the ability to intercept twenty-five missiles,⁴⁰ Pakistan should have fifty.

Pakistan can also go for qualitative technologies in order to improve the penetration capabilities of the Indian BMD, as well as to fog the Indian interception system. Pakistan can use stealth technologies like skin cooling or balloons so that the heat from the warheads is not detected and

they are ‘invisible’ to radars and detectors.⁴¹ Another option is to deploy decoy warheads alongside live warheads in order to confuse the interception system. Maneuverable warheads can also be developed and deployed, which essentially change course midway and miss the trajectory calculations of the BMD system.⁴² Other strategies could be the use of chaff clouds and degeneration of the adversary’s radar capabilities.⁴³ Pakistan can also go for strategies like mobility, dispersion, and camouflage to increase the survivability of its nuclear force in case of a preemptive strike.

Pakistan can and has already started diversifying its delivery systems. Pakistan has already developed cruise missiles, which are harder to defeat with a BMD system. Pakistan has developed its cruise missile Hatf VII (Babur), which has been in service since 2005. According to an ISPR announcement, it can carry both nuclear and conventional warheads and is equipped with stealth capabilities.⁴⁴ It has a 700km range which can easily target major Indian cities. Pakistan’s development of its tactical nuclear weapons (TNWs) is also partially in response to India’s missile defence plans. The linkage is apparent from Pakistan’s announcement of its later test of Nasr.⁴⁵ The claims accompanying the test said that the cruise missile is specially designed to defeat all known anti-tactical missile defence systems. Pakistan foreign office spokesperson’s comments endorse this viewpoint, claiming that TNWs and cruise missiles were developed in response to the increasing conventional asymmetry with India, its offensive doctrine, and the development of BMD.⁴⁶ This confirms that development of TNWs and cruise missiles is in response to the threat emanating from India. The effectiveness of short-range ballistic missiles like Nasr against a BMD lies in its short flight time. It has a very short flight time, between 1-2 minutes, which means that the BMD system has an extremely short warning time to respond, perhaps seconds.⁴⁷ Also, the flight trajectory of Nasr is endo-atmospheric, which means the only option for India would be a terminal phase interception. This would be an advantage for Pakistan.

In sum, Pakistan’s best options to counter the instability introduced by Indian BMD is to go for a mix of qualitative and quantitative enhancements to its nuclear force in order to overwhelm and defeat the Indian defences. This, combined with the diversification of delivery

*Indian Missile Defence Development: Implications for
Deterrence Stability in South Asia*

systems like TNWs and cruise missiles, is the right path for Pakistan to go. However, at some point, Pakistan has to work on the naval leg of its nuclear deterrent to ensure the survivability of its nuclear forces, and to have an assured second-strike capability.

Conclusion

The paper has examined the implications of an Indian missile defence system on nuclear deterrence in South Asia. It concludes that the introduction of BMD by India destabilises deterrence by eroding Pakistan's nuclear deterrence. The notion of deterrence rests on mutual vulnerability. By developing and deploying BMD, India, at least theoretically, becomes invulnerable to a nuclear attack by Pakistan. This reduces the credibility of Pakistan's nuclear deterrent, thus rendering deterrence less effective. A BMD also increases the balance of resolve in India's favour in any crisis, with the net effect that Pakistan would be less resolute in a crisis, and likely to back down first. The latter would, therefore, be more vulnerable to coercion and attack by India. Indian missile defence would also provide incentives for pre-emption, and would fuel an arms race in South Asia. However, the real threat from a BMD is that, although it may not provide extensive protection against incoming missiles, it would create a false sense of security in the Indian strategic planners making them act belligerently in times of crisis and conflict leading to possible escalation.

The best policy option for Pakistan in order to counter the instability introduced by Indian missile defence developments is to pursue a mix of qualitative and quantitative improvements in its nuclear and missile forces. However, Pakistan would need to make its choices prudently in order to maintain a credible strategic symmetry, avoid an arms race and maintain the viability of its economy.

Notes and References

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missiles. There is a huge debate, partially outlined in the next paragraph, whether BMD affects deterrence or not. It depends on how extensive the BMD system is, how technologically developed and effective it is and whether it is deployed in a layered form. There is also debate on the effectiveness of the BMD. There are measures that can defeat and overwhelm a defence system (discussed in the last section), however, it can still have a psychological effect making the side possessing BMD act with belligerence and aggression in a crisis.

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*Indian Missile Defence Development: Implications for
Deterrence Stability in South Asia*

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27. Stephen L. Quackenbush, 742.
28. Robert Powell, "Nuclear Deterrence Theory, Nuclear Proliferation, and National Missile Defence," 106-7. Powell's model uses US and a rogue state as the two nuclear armed adversaries, but the model is very much applicable to India and Pakistan, where the former possessed BMD and the latter does not.
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*Indian Missile Defence Development: Implications for
Deterrence Stability in South Asia*

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