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MISSILE DEFENCE IN EUROPE:

STRATEDIC, POLITICAL AND INDUSTRIAL IMPLICATIONS

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STUDY

MISSILE DEFENCE IN EUROPE: STRATEGIC, POLITICAL AND INDUSTRIAL IMPLICATIONS

Abstract

Since the original announcement made by former U.S. president George W. Bush to build Ballistic Missile Defence(BMD)'s third pillar in Central Europe, BMD has become a widely discussed and contested issue. President Obama's review of the U.S. system (2009) paved the way for the construction of a multilayered system as a NATO capability which was endorsed by the Alliance at the Lisbon Summit (2010). Although the European Phased Adaptive Approach (EPAA) system proposed by the Obama administration is different from the original U.S. plans, it is now to be incorporated within NATO's Active Layered Theatre Ballistic Missile Defence (ALTBMD) architecture and, in addition, Russia has now been invited to participate. However, there are still a number of outstanding questions. This expert study investigates three dimensions of missile defence in Europe, placing the project in its proper strategic context, inquiring into its political implications and finally it assesses the industrial opportunities and challenges. The authors introduce three modalities of deterrence, the logic underlying each of them and the roles for missile defence (both territorial and theatre) in each case. The modalities identified are (1) the renewed strategic deterrence between the USA and Russia, (2) the deterrence of third states in reaction to their asymmetric nuclear threat, and (3) the reverse deterrence from intervention in regional conflicts. Taking into account the EU's securitization of ballistic missile proliferation, the new CSDP provisions of the Lisbon Treaty (especially the mutual assistance clause), strained EU-NATO relations, as well as the political, economic, technological and industrial benefits of Europe's increased participation, this study argues in favour of an EU role in missile defence that would facilitate Europe's common action. It also identifies the European Defence Agency (EDA) as an institution that could enhance cooperation in this area. Pointing out U.S. technological dominance, it calls for a common approach towards negotiations on the future involvement of European industry in the missile defence project, which should result from mutual dialogue between the key industrial actors and political representatives.

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EXECUTIVE SUMMARY

Since the original announcement made by former U.S. president George W. Bush to build Ballistic Missile Defence(BMD)'s third pillar in Central Europe, BMD has become a widely discussed and contested issue. President Obama's review of the U.S. system (2009) paved the way for the construction of a multilayered system as a NATO capability. Missile defence was endorsed as such at Lisbon Summit (2010). Although the European Phased Adaptive Approach (EPAA) system proposed by the Obama administration is different from the original U.S. plans, it is now to be incorporated with NATO **Active Layered Theatre Ballistic Missile Defence** (ALTBMD) architecture and Russia has been invited to participate. However, a number of questions remains unanswered and a number of issues unresolved. This expert study investigates three dimensions of missile defence in Europe – it places the project in its proper strategic context, inquires into its political implications and finally assesses its industrial opportunities and challenges. It introduces three relevant modalities of deterrence, the logic underlying each of them and the roles for missile defence (both territorial and theatre) in each of them. The modalities identified are (1) renewed strategic deterrence between the USA and Russia, (2) deterrence of third states in reaction to their asymmetric nuclear threat, and (3) reverse deterrence from intervention in regional conflicts. Taking into account the EU's securitization of ballistic missile proliferation, the new CSDP provisions of the Lisbon Treaty (especially the mutual assistance clause), the strained EU-NATO relations, as well as the political, economic, technological and industrial benefits of Europe's increased participation, this study argues in favour of EU's role in the missile defence system that would facilitate Europe's common action. It also identifies the European Defence Agency (EDA) as an institution that could enhance cooperation in this area. Pointing out U.S. technological dominance, it calls for a common approach towards the negotiations over future involvement of the European industry in the missile defence project, which should result from mutual dialogue between the key industrial actors and political representatives.

POLICY RECOMMENDATIONS

- As NATO BMD turns into a political reality after the NATO Lisbon Summit and the United States moves far ahead in BMD realization plans (with EPAA fundamentally transforming, rather than complementing the joint architecture), it is imperative that Europe increases its participation in the system to benefit from the opportunities it brings about in terms of political, economic, technological and industrial capital. The political capital rests particularly in increased burden-sharing and participation in the protection of its own populations and critical infrastructure, whereas the joint development of an industrial and technological base promises to increase its competitiveness even in face of current economic challenges.
- Through EDA, the EU could provide a platform for functional cooperation which, under favourable political circumstances, can be open to European states covered by NATO BMD, irrespective of their EU membership or declared statuses., Due to the effective merger of TMD/BMD technologies, missile defence may be seen as a capacity supporting crisis management operations and it may eventually come to be conceptualized as a collective safety instrument, a *protection* of dispersed populations and critical infrastructures in a broader concept of Europe's security rather than traditional *defence* against defined external enemies. However, an improvement in EU-NATO relations is a necessary condition for EDA to take up the envisioned role.

- EDA could be reinforced institutionally, while remaining faithful to its role of capacity development agency for Member States, and create conditions conducive to *ad hoc* projects in the area of missile defence.
- The need to improve EU-NATO relations. A dual-track approach aiming at formal improvement and enhanced functional cooperation is desirable. The latter could involve links between NATO and EDA within the Coherent Capability Development by extending it to specific areas of missile defence.
- The European Parliament could foster debate on missile defence and EU involvement in it in the broader context of discussion about reinforcing the EU's standing as a global actor. Such debate particularly should aim at sparking the political will necessary for functional cooperation, which is currently promoted also by transnational defence industries, as well as at transcending the differences in NATO-EU relations. It should use all means at its disposal to facilitate such debate and convey upon other relevant actors the importance and benefits of enhanced cooperation in the area of missile defence.
- Furthermore, the European Parliament could use its direct powers to improve the EU's industrial and technological base through increased funding of industry and defence cooperation in the 8th framework programme.
- The European Parliament could further inquire into the potential benefits and possible caveats of the EU's space policy as an instrument of fostering development of new relevant technologies (early warning, radar cueing, surveillance and reconnaissance) that could contribute to Europe's participation in the BMD and generally countering the ballistic missile threat. In doing so, it should take into account both technological and political and normative issues such as the militarization of space.
- The obvious discrepancy between U.S. and European missile defence capabilities should not be viewed as an insurmountable obstacle for cooperation and burden sharing. Rather, the key stakeholders should understand the project as a unique opportunity to balance the transatlantic strategic technology gap.
- Given the U.S. technological dominance in the area, the European allies should try to develop a common approach to increase the chances of their industries becoming efficiently involved in the missile defence project. The common positions should result from the mutual dialogue between the key industrial actors and political representatives.
- The U.S. – European industrial cooperation can build upon the existing transatlantic formats developed by the technological leaders on both sides of the Atlantic. The experience coming from these B2B structures should be also reflected in the political debate.
- The agreements over the development of a command and control system should be a primary focus in the coming months. Moreover, the respective capability for the Active Layered Theatre Ballistic Missile Defence (ALTMBD) has already been developing through transatlantic cooperation. Therefore, command and control system is both strategically important and industrially promising from the current as well as future perspective.
- The European industrial sector should attempt to overcome to any possible extent the intra-European competition in strategic areas. In accordance with the alleged acquisition model preferring single responsible contractors, the European strategic agreements must precede a negotiation of transatlantic deals.

– The attempt to harmonize attitudes implies that the European partners should rely on the acquisition system based on the largest possible common funding procedures. The multinational character of the project is essentially connected with its political and industrial success.

– The Russian Federation and the People's Republic of China should be integrated in the development and management of BMD systems which have a significant potential to destabilize deterrence between them and the US/NATO. The objective of such integration is that of enhancing the security of NATO countries through BMD without negatively affecting their strategic relationship with Russia and China.

INTRODUCTION

Since the original announcement made by former U.S. president George W. Bush to build the so-called third pillar of BMD in Central-Eastern Europe (the Czech Republic and Poland), the issue of ballistic missile defence has become one of the most discussed and contested issues. Although the current U.S. president Obama cancelled Bush's earlier decision concerning the construction of the third site, he has outlined an alternative plan to continue with the development and construction of a NATO multi-layered BMD system. Although partially different in its architecture, the proposed system still involves a good number of questions and uncertainties. This expert study investigates three dimensions of missile defence plans for Europe: the strategic context; the political dimension; industrial challenges and opportunities.

With regard to the first dimension, this part discusses the crucial strategic (and often misunderstood) link between the issue of ballistic missile defence (BMD)/theatre missile defence (TMD) and the issue of deterrence. It shows how and why this link is crucial for a productive understanding of the role of state actors (mainly the U.S.) and collective actors (mainly NATO) in missile defence-related security management. This original re-conceptualization of the link between BMD/TMD and deterrence based on previous work (Hynek 2010) introduces three relevant modalities of deterrence and analyses the different organizing logics upon which each of them rests. Furthermore, it systematically analyses the different roles of missile defense (both BMD and TMD) in each of them. The modalities recognized are: (1) renewed strategic deterrence between the USA and Russia based on an axiomatic logic of Mutual Assured Destruction (MAD), (2) deterrence of third states in reaction to their asymmetric nuclear threat, and (3) reverse deterrence from intervention in regional conflicts. The current and future role of collective actors, namely the EU and NATO, is being assessed within the framework which progressively integrates BMD/TMD and 21st-century deterrence.

The study continues with the assessment of BMD and TMD plans for the European territory. The key role of NATO and the emerging role for the EU in light of the Lisbon Treaty will be examined. The key dynamics analysed concern NATO's most recent thinking about missile defence. Specifically, three syntheses performed at the NATO Lisbon Summit are discussed in this context. As this part suggests, there have also been three outstanding clusters of political issues linked to NATO's development of missile defence architecture: the role Russia should play in the proposed system, the nominal character of U.S. multilateralism and NATO internal issues. The last section of this part focuses on the specific position and role of the EU in missile defence. The impact of the new legal and political framework defined by the Lisbon Treaty on evolving missile defense architecture in Europe is analysed. The mutual defense clause contained in the Lisbon Treaty is understood as an incentive for the EU to complement, rather than linearly follow, the related discussion that is already present in NATO. The link between the strategic conceptions of the EU (the ESS) and NATO (the new Strategic Concept) and declared recent and future threats are highlighted.

The third dimension examines the industrial dimension of missile defence, especially the current involvement of European subjects and future opportunities for a European industrial base. While it is noted that all existing missile defence systems have been developed in the US and Europe is being identified as technologically heavily dependent on the U.S in this area, this does not mean that European technologies could not complement the US systems in some of its parts. It is argued that three possible scenarios for a European approach towards BMD can be outlined, however two of these appear to be irrelevant. The first is the hypothetical option that European countries would develop its own predominantly non-U.S. technology-related system. The second is the technologically straightforward possibility based on the off-the-shelf purchase of American systems. The third - which is seen as the only realistic one - regards transatlantic industrial co-development and/or coproduction.

Missile defence program is one of the essential transatlantic issues and its industrial dimension offers an opportunity to support European research, development, and technology in this area. In terms of structure, the first section scrutinises existing missile defence systems. What follows is an analysis of the European Phased Adaptive Approach from a technological point of view; each of the phases is probed. The remaining space is dedicated to the discussion of possible European industrial involvement.

1 STRATEGIC DIMENSION[1]

1.1 Missile Defence in Relevant Modalities of 21st Century Deterrence

The following part investigates deterrence and its relationship to BMD from a synchronic perspective. At the moment, at least three deterrence modalities with different qualities and organizational logics can be distinguished in relation to the US missile defence. These modalities will be labelled here as *renewed strategic deterrence* (a), *deterrence of other states in reaction to their asymmetric nuclear threats* (b) and *reverse deterrence from regional conflict intervention* (c).

1.1.1 Renewed Strategic Deterrence between the USA and Russia in the MAD logic

In 2009, clear signs of a deterrence strategy in place between the USA and Russia are still visible.[2] This renewed deterrence is based on an approximate strategic parity and the MAD logic and the mutual vulnerability axiom.[3] The post-Cold War renewed deterrence between the USA and Russia is politically rather informal in its nature, compared to the Cold War, but it is still highly institutionalised.[4] Despite being politically (and, to a certain extent, legally) informal – a fact manifested by both parties' preference for a loosely synchronised unilateralism at best in observing some of the aforementioned treaties - this modality is the most established one among those analysed here. It shows features of what Patrick Morgan calls 'trappings of a resource for international system management', resulting in a deterrence 'regime'.[5]

The centrality of ongoing efforts for strategic parity in the Russian-US renewed modality of deterrence informed by MAD logic is also evident from the projections of future developments in the number of Russian strategic warheads. Russia will be reducing the intercontinental ballistic missile (ICBMs) count from 1,847 in 2007 to 254 in 2020. The number of submarine-launched ballistic missiles (SLBMs) will, however, be increased from 624 to 744 over the same period, or the reductions will only be very small, as in the case of strategic bomber-borne nuclear warheads (from 872 to 728 over the same period).[6] The objective is clear: geographic dispersal and increased mobility of the Russian strategic arsenal for a potential retaliation in the MAD logic, copying the US strategy. The aim is to reduce the vulnerability of the Russian strategic potential for a possible retaliatory strike, while increasing the survivability in case of an opponent's nuclear strike (i.e. striving for qualitative parity and not just quantitative strategic parity).

The proofs of an informal, yet highly institutionalised strategic deterrence resting on MAD logic emerge when missile defence is used as a testing issue area for this claim.[7] Specifically, the USA and Russia were engaged in an interesting exchange over the proposed third site of the US BMD project before the

[1] This part is based on Hynek, N., 2010

[2] See Morgan, P., Paul, T.V., and Wirtz, J., 2009; Fedorov, Y., 2008

[3] See START Treaties and the SORT Treaty.

[4] For a typology of deterrence relationships based on their level of establishment, see Howlett, D., 2001, page 20

[5] Morgan, P., 2005, page 751

[6] Pullinger, S. et al., 2007

[7] See Cimbala, S., 2008

current US President Obama decided to shelve it and opt for an alternative plan. It started with the Russian complaint of the danger posed by the third site of US BMD (with planned missile defence elements in the Czech Republic and Poland) for a future Russian retaliation.[8] These objections – as well as the US reply assuring Russia that there would be no limitation of its strategic deterrence capability if the third site of US BMD was built[9] - signalled the continuation of the mutual vulnerability logic, i.e. MAD in a dyadic relationship.

1.1.2 Deterrence of States developing Asymmetric Nuclear Threats

While the first modality was said to rest on a renewed great power logic originating in the Cold War bipolar era, the modality of deterrence of states developing asymmetric nuclear threats is based on an entirely different set of assumptions. Although this modality, especially through the imageries contained in the recent political discourse (the notion of 'rogue' states that are irrational, see Jervis, 2009), seems to be a relatively new, post-Cold War phenomenon, the situation is more complex. While the actual *modality* emerged after the Cold War, originating largely in the first Gulf-War experience and the following US strategic-planning reaction to its existence, the actual illicit proliferation of fissile nuclear materials and missile technologies as well as related secret WMD programs in some of the countries later dubbed as 'rogues' had already been underway during the Cold War.

As far as the relationship between actors in this modality is concerned, it is typical of low institutionalisation if any, forming a non-established deterrence relationship. The axiomatic logic of MAD based on mutual vulnerability, devised for the situation of strategic parity between superpowers, is useless for this modality as its logic needs to work with asymmetric threats (for example, in extreme cases, a single ballistic missile with a primitive nuclear warhead) launched by one of these states. The central argument in this modality is the claim that political leaderships of these states are irrational and thus cannot be deterred, or, in a milder version, that the reverse cannot be guaranteed. This claim is consequently used as a justification for the need to have a limited missile defence system in place.

In order to demonstrate the different role missile defence plays in this modality as opposed to the previous one, Fareed Zakaria's interview with Thomas Schelling from 2001 is highly instructive. During this interview, Schelling points out the difference between missile defence plans in the 1970s and today. In the first case, missile defence was planned, according to Schelling, to be a complement to a strategic offensive arsenal, resulting in a trigger-happy effect. That is also why missile defence was limited so much as it favoured the party that struck first. The new modality, on the other hand, is based on the assumption that deterrence by a strong offensive strategic potential must be complemented with a missile defence whose function is truly defensive (destroying nuclear missiles launched by a state with asymmetric capabilities) instead of being a complement to offensive strategy (a first strike by the USA).[10] The nature of missile defence is therefore less defined by its *design* than by its *function* in the framework of a larger strategy that it is part of. In the latter instance, it is used in case of an offensive strategic deterrence failure, i.e. if the strategy to deter the aggressor by the possession of offensive nuclear weapons. A claim by Thomas Schelling – one of the proponents of using MAD (and thus also a strong reduction in or a ban of missile defence systems) in US-Soviet Cold War deterrence – about the *benefits of missile defence system(s) to face asymmetric nuclear threats by rogue states*, specifically North Korea and Iran, providing that these systems are highly effective, is a proof of deterrence having several dissimilar modalities, also in their relationship to missile defence.[11]

[8] Traynor, I., 2008
[9] McCullough, C., 2008
[10] Zakaria, F., 2001
[11] Ibid.

The most detailed analysis of the influence of the level of missile defence system effectiveness on the actions of both the rogue state and the USA (i.e. of the second deterrence modality) is to be found in the recent work of US political scientist Robert Powell.[12] This author uses a game theory model to show that, if the USA had a missile defence in place with a nearly 100% operational effectiveness, the country would be resolving rogue state-related crises using much more robust capabilities: the higher the effectiveness, the harder the US stance towards such a rogue state. Powell maintains that this behaviour will result in a higher risk of nuclear attack by the rogue state. The more of a 'rogue' the state is, the higher the threshold of maximum risk taking – or brinkmanship – by such a country, and the more favourable balance of resolve for the rogue state.[13] As Powell points out, this development will not – as commonly presumed – be a result of an overestimation of the effectiveness of the US system, but a direct consequence of the US pushing its interests and objectives harder during the crisis.[14] Powell's conclusions have a direct impact on the political role of the US Allies in the missile defence, especially after the NATO Bucharest Declaration from April 2008 explicitly acknowledged and the NATO's New Strategic Concept of 2010 reaffirmed the need to link the future US BMD System with NATO's Active Layered Theatre Ballistic Missile Defence (ALTBMD) system.

1.1.3 Reverse Deterrence from Regional Conflict Intervention

Reverse deterrence from regional conflict intervention is the last deterrence modality discussed in this article. Even though sharing the same strategic environment, low institutionalisation of the nuclear relationship between actors[15] and asymmetry of the relationship with the second modality, this modality differs in the change of roles between the deterred and the deterrer: the USA's primary role here is the *object* of deterrence, i.e. the deterred country.[16] It is the regional nuclear states that are the *subjects* of deterrence or the deterrence agents.[17] Scott Sagan claims that regional nuclear states treat nuclear weapons as weapons of *deterrence and power projection outside their borders* (e.g. by provoking regional conflicts, annexing non-nuclear states), typically in their region.[18] The key question, then, is not whether the USA can deter, for instance, Iran or China from a nuclear attack, but whether these states can deter the USA or a collective actor from a regional intervention to restore order in the region. The dilemma for potentially intervening countries, such as the USA, lies between intervening and thus risking a nuclear attack against the intervening state and/or its allies (where, obviously, the presence and effectiveness of a missile defence system will have influence on such decision-making) and a decision not to intervene which undermines the US's military and political credibility for similar crises in the future.

Oliver Thränert examines this modality in the 'Iranian scenario' dominating the current international policy debate on missile defence.[19] Thränert asks whether BMD systems placed outside of the USA can help the USA and the Allies to regain freedom of action for a potential regional intervention in the Persian Gulf or Iran itself. Thränert makes a convincing case about the decision being bound to be more difficult due to different calculations by the USA and European allies as the levels of danger would differ

[12] Powel, R., 2003, pages 86-118; also see Quackenbush, S., 2006
[13] Ibid., pages 105-106
[14] Ibid., pages 111-112
[15] A low or zero institutionalisation of the nuclear relationship between actors in this modality is typical for cases where one of the actors is a rogue state (e.g. Iran or North Korea). If a regional power with a formally recognised nuclear arsenal and existing deterrence strategy, such as China, is in the place of a rogue state, one can talk of a semi-established deterrence relationship.
[16] See Lowry, R., 2001, pages 31-32; Miller, S., 2001, pages 98-100; Wilkening, D. & Watman, K., 1995
[17] For probably the first outline of this possibility, see Betts, R., 1995-1996, pages 70-79
[18] Sagan, S., 1995
[19] Thränert, O., 2007, pages 9-18

among them due to geography and the USA's reputation as a superpower. While the development of an effective missile defence system would result in greater US willingness to intervene, i.e. in *greater room for manoeuvre for the USA*, European allies would benefit from *damage limitation* in case of a potential Iranian nuclear attack. Within this modality, the US effort to prevent a situation where the European allies would find themselves hostage to deterring states from such a problematic region (when the latter would blackmail the USA) is often used as an argument in favour of placing a limited system(s) of BMD outside of the US mainland.

A similar scenario of this modality in terms of the deterrence logic – though structurally different, is a 'Taiwanese' scenario that directly involves the USA and China as deterrence actors and Taiwan as a potentially triggering country. As for the structural differences, there are several features making the Iranian and Chinese cases different. First, China is not a rogue state, but an established regional power and an emerging great power, a fact that is in turn reflected in operational codes and perceptions of the political elite.[20] Additionally, China is an internationally accepted nuclear power, possessing strategic nuclear capabilities with its own nuclear and ballistic-missile program, which was developed over a long-term period of time. Also, one must not forget that China has been a party to the Nuclear Non-Proliferation Treaty since 1992. Unlike China, Iran does not currently possess a nuclear weapon – it has been developing one at the most. As the following lines suggest, the above structural differences should not, however, overshadow the modality-derived similarities between the two cases.

Even though the Taiwanese scenario is not (yet) a much-discussed option in the US political discourse nor in the US and European media discourses,[21] it is one of the most frequently debated scenarios in existing strategic analyses and plans in the (mainly US) security community.[22] Several sequences of actions are possible in the Taiwanese scenario. The one addressed most frequently in various analyses starts with a unilateral provocation by the Government of Taiwan (e.g. declaration of independence, radical change in military priorities and strategy, etc.), continues with China's effort to prevent this step with conventional forces, continues further with a US threat of regional intervention (with conventional weapons), and ends with China declaring that it cannot guarantee refraining from the use of nuclear weapons if it is a matter of national interest.[23]

What is more, China has in the recent past undergone a change in nuclear strategy, moving from *minimum deterrence,* based on the commitment of not attacking first and securing the capability of at least one ballistic missile with a nuclear warhead to reach the USA in a retaliatory strike (primarily civilian targets, cities in particular), to *limited deterrence* (you xian wei she), a strategy still in development.[24] This new strategy differs from the previous one in several crucial aspects, most importantly in including different types and ranges of ballistic missiles as well as cruise missiles while counting on an active use of China's nuclear potential in case of a conventional or nuclear war.[25] This change was geared towards

[20] For the concept, see Jervis, R., 1976

[21] For an exception, see Keller, B., 2001, page 29

[22] Delgado, R., 2005; Urayama, K., 2004, pages 123-142; Ross, R., 2002, pages 48-85; Mulvenon, J., 2002

[23] As far as the possibility of the use of nuclear weapons by the USA, contemporary strategic documents show that unlike China, the USA have sought to increase their threshold for the use of nuclear weapons. This has been given by the combination of existing conventional alternatives with the robustness of today's nuclear taboo in the international community - see Tannenwald, N., 1999, pages 433-468. The difference between China's and the USA's nuclear thresholds illustrates the 'asymmetry of fervour'. According to this notion, China perceives Taiwan as a more significant and emotional cause than is the case of the USA. For this reason, the nuclear taboo constraint will not be as important for China as it is for the USA, see Mulvenon, J., 2002.

[24] Godwin, P., 2002; Johnston, A., 1995/96, pages 5-42

[25] Johnston, A., 1995/96, pages 5 and 12

maintaining a credible deterrence capability and, in a more recent context of the US/NATO missile defence system getting under way, also by China's fear that the USA – protected by a missile shield - might get engaged in a direct military intervention in the region. And it is on the basis of US preferred missile defence system architecture that the structure of Chinese nuclear forces will be enhanced.[26]

China's aim is to have a *guaranteed limited deterrence* strategy in all circumstances. It is quite obvious that China's strategic thinking will be influenced by the *nature* of a missile defence system, particularly if China decided to deter the USA from a regional intervention by holding US European allies and/or Japan as hostages. The possibility that China could resort to such a threat cannot be ruled out, if only because the planned number of ground based interceptors (GBIs) on US territory (at the Fort Greely base in Alaska and Vandenberg base in California) will reach 44 by 2013, which effectively eliminates the Chinese strategic nuclear arsenal directed at the USA.[27] Consequently, the parameters of future USA and/or NATO and/or Taiwan and/or Japan's BMD system would be decisive in the hostage possibilities. China may perceive certain future BMD capabilities of the USA and its allies as an effort to eliminate Chinese deterrence capability not only by the USA but also by the European NATO members since US BMD and NATO ALTBMD are to be linked. In order to prevent this situation, the USA and NATO will need to stick to officially declared threats, to the repeated commitment to a *limited* missile defence system as well as to a joint threat assessment.

1.2 Development of Strategy and Practical Implications

The previous part directed attention to empirical and conceptual contours of each of the modalities and discussed its links to BMD. In respect of the following lines, two objectives are set: first, to theoretically deepen the discussed deterrence modalities, including a further conceptualization of possible links to BMD; second, to meet the previous objective in the fashion that the issues discussed in earlier parts are factored in, so the final conceptualization which is summarized in the form of a table carries clear implications for future academic research, strategic planning as well as political practice. The above two objectives are met by connecting the BMD/deterrence-modalities approach with existing cutting-edge scholarship on deterrence. For this reason, relevant concepts and theoretical issues contained in the deterrence literature are identified, specified and used within the structure of three qualitatively different modalities in order to further positive heuristics of this approach. Not only will the following conceptual development of the three modalities show the need to *tailor* deterrence but it,[28] too, demonstrates that an ontologically different take on deterrence is needed for each of the discussed

[26] Stokes, M., 2002, pages 107-168; McVadon, E., 2002, pages 169-198

[27] Two types of Chinese intercontinental strategic ballistic missiles are relevant: Dong Feng (DF)-4 (range of about 6,000 km, approximately 20 missiles in total) and DF-5 (intercontinental range of 13,000 km, approximately 20 missiles in total). China has also been working on the development of the DF-31 (8,000 km range) and DF-31A (12,000 km range) ballistic missiles using solid-fuel propulsion which makes them more stable and faster to launch, see Natural Resources Defense Council, 2006, pages 60-63; Urayama, K., 2004, pages 132-134.

[28] See Department of Defense of the United States, 2006, pages 4 and 49; Schear, J., and Flanagan, S., 2008, pages 79 and 285; Payne, K., 1996, page 129; Wilkening, D. & Watman, K., 1995, pages 27-55

modalities. Only then, I will argue, one can comprehend the full richness of possible relationships between deterrence and BMD.

Table 1. The Modalities Approach: Links between Deterrence and Missile Defense (Based on Hynek 2010: 447-449)

<table>
<tr><th>MODALITY 1
(Renewed Deterrence between the USA and Russia)</th><th>MODALITY 2
(Deterrence of Rogue States)</th><th colspan="2">MODALITY 3
(Reverse Deterrence from Regional Conflict Interventions)</th></tr>
<tr><td colspan="4">BASIC CHARACTERISTICS</td></tr>
<tr><td rowspan="2">Strategic nuclear deterrence (general deterrence, mutual, symmetrical, unilateral drive, bilateral security management)</td><td rowspan="2">Broader deterrence (general deterrence, one-sided or mutual, asymmetric, unilateral/extended security management)</td><td colspan="2">a deterring country: Tactical or strategic nuclear deterrence (immediate deterrence, a possible link to general deterrence); the USA and/or a collective actor as a deterred entity: Immediate or general deterrence (can be a part of US strategic or broader deterrence); mutual, asymmetric</td></tr>
<tr><td>Rogues with NWs
- a collective actor as a deterred entity (US/NATO/EU/UN coalition)
- unilateral/extended/broad collective security management</td><td>Great/Regional Powers with NWs (China)
- USA as a deterred actor
- unilateral/extended security management</td></tr>
<tr><td colspan="4">MODEL</td></tr>
<tr><td>Classical Model of MAD Deterrence</td><td>The Combination of the Spiral Model and the Tailored Deterrence Model</td><td colspan="2">Tailored Compellence/Deterrence Model</td></tr>
<tr><td colspan="4">SCENARIOS</td></tr>
<tr><td>direct nuclear exchange</td><td>Rogues: initially nuclear and missile-technology programs, later direct nuclear attack against the US and/or hostage-taking scenarios (NATO/ EU/Israel/Japan etc as hostages)</td><td>Rogues: invasion of another country; direct nuclear attack against the US/collective actor in light of their intervention, and/or hostage-taking scenarios (NATO/EU/Israel/Japan etc as hostages)</td><td>China: the invasion of Taiwan and direct nuclear attack against the USA in light of the US intervention, and/or hostage-taking scenarios (NATO/EU/Japan etc as hostages)</td></tr>
<tr><td colspan="2">DETERRENCE BY</td><td colspan="2">COMPELLENCE/DETERRENCE</td></tr>
</table>

nuclear punishment (direct nuclear exchange)	- *reward* (economic/technological; the stage before adversary's acquisition of NWs/nuclear attack) - *punishment* ('dual-containment strategy' – military side: selective and calibrated use of conventional weapons (NWs: ambiguity); economic side: targeted sanctions) - *denial* (passive and active defences)	- *compellence* (the stage before adversary's use of NWs) – compel the rogue to quit short of being defeated – conventional war-fighting capabilities - *deterrence by punishment* (stage 2): selective and calibrated use of conventional weapons (NWs: ambiguity) - *deterrence by denial* (stage 2): passive and active defences	- *compellence* (the stage before China's use of NWs) – compel China to quit short of being defeated – conventional war-fighting capabilities - *deterrence by punishment* (stage 2): selective and calibrated use of conventional weapons (NWs as the last resort option) - *limited deterrence by denial* (stage 2, see below)
COST-BENEFIT/TARGET ANALYSIS			
very narrow (preoccupied with a nuclear attack, also in adversary's decision-making)	*inclusive value inventory* (economic, political, cultural, social, and military elements), alternative images	*medium* breadth of the *value inventory* (military, economic, and political elements), inclusion of alternative images of the opponent	
FORMS			
high formalization and high institutionalization of the nuclear relationship	- economic/social cooperation (initial stage only) - extended deterrence & extended defence - non-existent to low formalization and institutionalization of the deterrence relationship	- extended deterrence & extended defence - non-existent to low formalization and institutionalization of the deterrence relationship	- possibility of 'serial deterrence' (eventual use of NWs to prevent it) - extended deterrence & extended defence (limited) - medium formalization and institutionalization of the deterrence relationship
THREATS			
unbearable nuclear damage	*unacceptable* damage (various kinds)	*unacceptable* damage (various kinds)	
CREDIBILITY			
high (MAD)	conventional weapons - high;	conventional weapons – medium to	conventional weapons – medium to high

	NWs (if included to deterrence threats) – medium; MD - high	high (stage 1), low to medium (stage 2), MD – high	(stages 1 and 2), NWs (if included to deterrence threats) – medium; MD - high
MISSILE DEFENSE			
BMD and TMD as discrete defences ***BMD***: *Axiomatic perspective* (absence of threats to defend in the MAD logic) – BMD destabilizing vs. *Capabilities-based perspective* (BMD with a small no. of interceptors against rogue states does not pose a threat; their greater number as potentially destabilizing) ***TMD***: *Axiomatic perspective* (no impact or limited impact under the Second Agreed Statement to the TMD Demarcations Accords) vs. *Capabilities-based perspective* (potentially destabilizing, especially exo-atmospheric systems)	*multi-layered system* - technological development blurs the line between BMD and TMD - open-ended, complex and flexible design – always needs to be tied up to politically declared threats - integration of the US BMD and TMD systems into collective actor's ballistic defense - future meta-system's backbone at the collective level - if composed of sea-, land-, and/or air-based elements, the system reinforces deterrence - if it includes space-based weapons systems, it has the potential to destabilize deterrence with legitimate nuclear powers (unless they fully participate in this system)	*multi-layered system* - technological development blurs the line between BMD and TMD - combination of BMD and TMD reinforces compellence/deterrence - highly mobile design, deployable in times of a crisis, provisional system - emphasis on the deterred actor's regional BMD and TMD capabilities - if composed of sea-, land-, and/or air-based elements, the system reinforces compellence/deterrence - if it includes space-based weapons systems, it has the potential to destabilize deterrence with major nuclear powers (unless they fully participate in such a system)	*- BMD and TMD as partly discrete defences* (de-escalation: general deterrence) *- BMD and TMD assembled into a multi-layered system* (a crisis: immediate compel./deter.) - both BMD and TMD potentially destabilize deterrence (defense-offense arms races) preventive/reassuring measures: ***BMD:*** - general de-escalation: interceptors on the US mainland only; conflict escalation: regional presence of sea-based/air-based interceptors; flexible caps – contingent on whether or not China is politically declared a threat ***TMD:*** - regional TMD above current capabilities destabilizing (mainly Taiwan, to a lesser yet still significant degree Japan) - discrete C2/C3 (full integration undesirable) - highly mobile design, deployable in times of a crisis

1.2.1 Modalities and Theory/Strategy Nexus

As will become clear, the modalities approach carries certain advantages for the two objectives specified above as it is able to overcome problems associated with the existing nexus between the *deterrence theory* with its core assumptions and *deterrence strategy*.[29] The latter is currently torn between two contradictory attempts that cannot be reconciled if the link to deterrence theory is not problematized: to retain its commitment to the classical deterrence model and, at the same time, to erase this connection in order to be able to include preparations for different types of nuclear threats. This nexus, in effect forming the basis for the so-called *strategic nuclear deterrence*,[30] is nowadays important only for the first modality. As previously discussed, unique characteristics of the first modality are given by bilateral MAD symmetry and preoccupation with strategic nuclear weapons and attempts to prevent direct nuclear attack that is presumed in case that one side gains a significant advantage over the other. As far as the second modality is concerned, Snyder's notion of *broader deterrence*, i.e. the process of influencing enemy's intentions that operates during war as well as prior to war, is seen as a productive starting point for its further conceptualization.[31] Moreover, as this modality shows, deterrence need not be mutual.[32]

An interesting situation occurs in the third modality: the US is positioned to a role in which it primarily becomes a deterred country (an object of deterrence). A deterring country (either a rogue state equipped with nuclear weapons or a great/regional power such as China), relies on *tactical or strategic nuclear deterrence*.[33] It is manifested in the form of *immediate deterrence* (usually a rogue state) or *general deterrence* (e.g. US-China-Taiwan triangle), possibly the hybrid of the two. In his superb analysis, Patrick Morgan argues that immediate deterrence can occur in the situation of a major confrontation and defines it as 'highly episodic, [being] associated with crisis and confrontation'.[34] He adds that 'by contrast, general deterrence comes into play where two or more actors have a *potential* for significant conflict'.[35] Importantly for what is seen in this article as one of the key differences between the second and third modalities, Morgan maintains that immediate deterrence cannot be understood merely as an extension of general deterrence, but as a fully-fledged alternative.[36]

In practice, however, the US – either alone or as a part of a collective actor – will also be a subject of deterrence in the third modality. It will rely on immediate or general deterrence that can, but does not need to be, a part of US's strategic deterrence (e.g. with China) or broader deterrence (e.g. with Iran or North Korea). Additionally, further examination of the third modality - as well as the second modality - and their relationship to BMD cannot limit itself to a *core-deterrence* view but needs to work with the notion of *extended deterrence*.[37] That includes, apart from main actors in the deterrence relationship, territories of allies and US/collective actor's expeditionary/contingent forces. Indeed, security

[29] The key elements of classical deterrence theory are: 1. existence of a severe conflict; 2. the assumption of rationality; 3. the concept of a retaliatory threat; 4. the concept of unbearable damage; 5. the idea of credibility; and, 6. the problem of stability, see Morgan, P., 2003, pages 8-22 and 268; also see Dorff, R., and Cerami, J., 2001, page 111. As the modalities approach demonstrates, several of them, if not all, need to be modified or even abandoned if theoretically meaningful and practically relevant development and conceptualization of the link between the modalities and BMD is to be produced.

[30] Dorff, R. & Cerami, J., 2001, pages 109 and 116

[31] Snyder, G., 1961, page 11

[32] For this point, see Dorff, R. & Cerami, J., 2001, page 115

[33] For the notion of tactical deterrence, see Morgan, P., 2003: 11

[34] Morgan, P., 2003, page 80

[35] Ibid., page 81, emphasis added

[36] Ibid., pages 81-82

[37] See Best, M., Hughes-Wilson, J. & Piontkowsky, A., 1995, page 19; Jervis, R., 2005, pages 63-72; Quester, G. & Utgoff, V., 1994; Cimbala, S., 1987

management will look differently for the USA as a sole deterring actor and for a collective deterring actor such as NATO (an institutionalised collective actor) or an ad-hoc UN coalition (a not-fully institutionalised collective actor).[38] As the above table suggests, issues related to levels of credibility need to be taken into account, as collective actors cannot ensure the same level of credibility as the USA, Furthermore, the nature of one's opponent and the selection of punishing weapons (conventional vs. nuclear, or both) will be a significant factor to one's credibility.

As far as the three modalities are concerned, the key difference among them lies in how one can conceptually address the question of how to deter an adversary in each of the modalities. Two conceptual moves are performed here: First, the use of classical, though often forgotten, division of deterrence (punishment, denial) by Glen Snyder is applied in this context. Second, an almost automatic avoidance of juxtaposition of compellence and deterrence is refused here and the argument in favour (or rather the necessity) of their combination is put forward. Before deterrence for each of the three modalities is discussed, one needs to acknowledge that different models are at play here. The first modality relies on the *classical model of MAD deterrence*, where deterrence is achieved by *nuclear punishment*. In this model, the performed cost/benefit analysis is very narrow and does not go beyond an assumption that both sides in a dyadic relationship are preoccupied with a possibility of a massive nuclear attack (their rationality is assumed to be the same). The only way of preventing the other side's first strike is through issuing declaratory threats of causing *unbearable damage*. Unbearable damage is greater than *unacceptable damage*. In Morgan's words, '*Unacceptable damage may not be enough to deter* … the relevant attacker calculation is whether, if the worst occurs, it will be at least 'bearable' for the leader, the regime or the nation.[39] It is possible to argue, in line with Morgan, that the first modality, due to the use of axiomatic MAD logic, is the only modality relying on unbearable – rather than unacceptable – damage.[40]

The second and third modalities are more complex and are founded on completely different conceptual models and organizational logics. As far as the second modality is concerned, the basis of its structure rests on what I call the *combination of the spiral model and the tailored deterrence model*. While the notion of tailored deterrence, i.e. crafting a deterrence strategy on the basis of who is the adversary, what is at stake and what is the nature of threat, has been introduced, the spiral model demands some specification. This model was outlined in Jervis and was proposed for a contrast with the deterrence model.[41] While the former focuses on positive inducements and suggests that one should strive for cooperative interactions with the adversary (conflicts arise from early and unsubstantiated punishment), the latter assumes the natural existence of a severe conflict and counter-argues that conflicts in fact arise from appeasement and concession-making.[42] As for the third modality, it relies, in both of its sub-modalities, on what is termed the *tailored compellence/deterrence model*. As the discussion contained below demonstrates, the most productive way of dealing with the adversary in this modality is through the combination of the compellence model and tailored deterrence model. While deterrence is about influencing behaviour of the opponent in accord to desires of the first actor, compellence is about the use of force or threats of force to convince the opponent to stop an action that is already under way or reverse that action and its effects.[43] In the words of Lebovic, '[m]uch of the contemporary nuclear debate, applied to fledging nuclear powers, is really about compellence … The

[38] Morgan, P., 2003, pages 172-202 and 242-284; Utgoff, V., 1997
[39] Morgan, P., 2003, page 265, emphasis in original
[40] Ibid., page 268.
[41] Jervis, R., 1976
[42] Jervis, R., 1976, pages 58-113
[43] Cimbala, S., 2002, pages 155-156

challenges for US policymakers are that much greater when compellence combines with deterrence issues and which of the two is most critical is not well understood'.[44]

1.2.2 Ways of Achieving Deterrence (and Compellence)

While it was suggested that the first modality is conceptually exhausted by deterrence by nuclear punishment, the two other modalities are different and conceptually more difficult. As far as the second modality is concerned, the fact that it starts from a broader-deterrence perspective and rests on the spiral model and the tailored deterrence model means that deterrence is achieved by several complementary ways. Specifically, these are *deterrence by reward*, *deterrence by punishment* and *deterrence by denial*. While deterrence by punishment and deterrence by denial have already been evoked in the earlier part of the article and can be said to be the difference between one's capability to inflict severe damage on the adversary (massive, or limited/calibrated retaliation) and one's capacity to deny gains to the enemy,[45] deterrence by reward is usually neglected in the deterrence literature. This is even more surprising since Snyder discusses this possibility in his book and this discussion deserves to be quoted at length as it informs further conceptual development concerning the second modality:

> *'One deters another party from doing something by the implicit or explicit threat of applying some sanction of the forbidden act is performed, or by the promise of a reward if the act is not performed. Thus conceived, deterrence does not have to depend on military force. We might speak of deterrence by the threat of trade restrictions, for example. The promise of economic aid might deter a country from military action (or any action) contrary to one's own interests … In short, deterrence may follow, first, from any form of control which one has over an opponent's present and prospective 'value inventory'; secondly, from the communication of a credible threat or promise to decrease or increase that inventory; and, thirdly, from the opponent's degree of confidence that one intends to fulfil the threat or promise'.*[46]

Importantly, Snyder's characterisation of ways in which deterrence can be effectuated indicates that the threatened response within the second modality needs to take several forms and employ a wide range of elements of power. This in turn requires a broad cost-benefit analysis that includes a detailed planning that concerns targeting of the adversary's *value inventory*, i.e. things that are most precious to this actor.[47] This advancement will allow for overcoming the unproductive debate about the link between deterrence failure and the irrationality of the opponent.[48] As the table suggests, cost-benefit analysis of adversaries' value inventory should be complemented by a technique known in political psychology as Alternative Images of the Opponent.[49] The aim of this technique is to avoid the pitfalls of best-estimate thinking and consequently to develop alternative images of the adversary's reasoning. The deterrence by reward is seen as a useful tool for the stage before the adversary's successful development/acquisition of nuclear weapons (e.g. Iran's current stage), or before adversary's nuclear attack against the US and/or allies. If the adversary used ballistic missiles tipped with nuclear

[44] Lebovic, J., 2007, page 23; also see Wirtz, J., 2009, pages 321-331
[45] Snyder, G., 1961, pages 14-16 and 41
[46] Ibid., pages 9-10
[47] For a discussion regarding US failure to think carefully about North Korean value inventory, see Dorff, R., & Cerami, J., 2001, pages 119-120
[48] Stein, J., 2009; Jablonsky, D., 1991
[49] For an application to defense planning, see Davis, P., 1997, pages 141-152

warheads,[50] the simultaneous use of deterrence of punishment resting on the dual-containment strategy (i.e. the combination of economic and military punishment)[51] and deterrence by denial would be seen as an optimal response in this modality.

The question of how to deter/compel the opponent is even more complicated in the third modality in which it is actually the opponent who signals readiness to deter the US and/or the allies (various hostage-taking scenarios, see the table) from the intervention into a regional conflict.[52] Although the rogue-state scenario and the Chinese/Taiwanese scenario show certain differences (especially to missile defense, see below), the structure of compellence/deterrence is the same. This is a modality in which deterrence needs to be combined with compellence in order to achieve the desired effect. In concrete terms, US/collective actor's involvement begins by the use of conventional war-fighting capabilities to compel the adversary to quit short of being defeated (to withdraw from an occupied country such as Kuwait or Taiwan). The concurrent use of deterrence by punishment and deterrence by denial is reserved for the situation in which the previous use of compellence is not successful.

It is clear that deterrence by punishment cannot be primarily (if at all) centred on the use of nuclear weapons (the same regards the second modality). There has been a series of interesting analyses making this point.[53] One reason is USA's superiority in *military technology* that can achieve the destruction of rogue state's value inventory by pure reliance on conventional weapons. Another reason, especially important if a collective actor is involved in a given scenario as a deterring actor, is the *legitimacy of means*.[54] Indeed, the reservation of conventional weapons for deterrence by punishment can be balanced by resorting to strategic ambiguity about the use of nuclear weapons, rather than by a declaratory policy that would *a priori* rule out this possibility. The only possible exception here is the scenario which involves China and the reason for explicitly including nuclear weapons (as weapons of last resort) is to prevent what Morgan calls *serial deterrence*: '[Y]ou threaten, the other side attacks, you respond, so they respond, so you respond'. Compared to China, a rogue state would not have the same capabilities to engage in the serial deterrence with the US, hence the difference in the role of nuclear weapons. With regard to differences in deterrence by denial between the two sub-modalities, they are tackled below.

1.2.3 Conceptual and Practical Implications for Missile Defense

In the following lines, I will conceptualize possible links between BMD and the three modalities of deterrence, including their practical implications. Indeed, such a discussion is possible only once the modalities were previously theorized and the nature of deterrence in each of them was specified and discussed. In respect of the first modality, the basic assumption with which both U.S. and Soviet/Russian politicians and legal experts have worked is that BMD and TMD are *discrete defences*.[55] For each type of missile defense in this deterrence modality, I distinguish between what I call an *axiomatic perspective* and a *capabilities-based perspective*. From the axiomatic perspective on which the MAD logic has rested, BMD is automatically considered destabilizing and TMD as non-problematic as the Anti-Ballistic Missile

[50] This could include a stage in which the adversary would be preparing for such an attack and there would be clear evidence about this preparation. On the other hand, pre-emptive strikes of any kind are neither considered in this modality nor in any other.

[51] Dorff, R., & Cerami, J., 2001, pages 119-120.

[52] For a related discussion, see Utgoff, V., 1997, pages 83-103

[53] See Fortmann, M., & von Hlatky, S., 2009, page 317; Cimbala, S., 2005, pages 44-57; Hopkins, J., & Maaranen, S., 1997, pages 117-119; Morgan, P., 2003, pages 273-276

[54] Morgan, P., 2003, page 276; Tannenwald, N., 1999

[55] When I discuss TMD, I focus on those systems that have potential capabilities to intercept a ballistic missile, especially exo-atmospheric systems such as THAAD.

(ABM) Treaty/post-ABM discourse and the Second Agreed Statement to the TMD Demarcations Accords of 1997 respectively suggest. This official discourse does not, however, correspond to what have been the developments on the ground. Specifically, the capabilities-based perspective shows that while a U.S. BMD system with a small number of antiballistic interceptors installed against a rogue state cannot pose a real threat to Russia (a greater number of such interceptors can, however, be destabilizing), the same perspective shows that TMD systems, especially exo-atmospheric TMD systems can be destabilizing for the MAD logic.[56]

The relationship between deterrence and BMD is completely different for the second modality and also for the rogue scenario in the third modality. The basic assumption is that BMD and TMD can – and should – be integrated into a *multilayered system* (such as NATO's ALTBMD). Here, technological development and political action results in blurring the traditional line between BMD and TMD.[57] While an open-ended, complex and flexible design of US/allied multilayered system allows for tailoring the system to one's actual needs, it, too, presents a danger to major nuclear states such as Russia and China. Therefore, the design of a multilayered MD system always needs to be tied up to politically declared threats and should include what I term *flexible caps* that are contingent on these officially declared threats. One of the partial differences for the second modality and the rogue scenario in the third modality lies in the permanency of a multilayered system. Whereas the second modality already foresees integration of the US BMD and TMD systems into collective actor's missile defense (NATO ALTBMD), the rogue scenario in the third modality requires a highly mobile, provisional system that would be deployable within the region in times of a crisis. As the previous discussion of deterrence modalities demonstrated, the second modality and the rogue scenario of the third modality converge on the fact that if the design of a multilayered system is composed of sea-, land-, and/or air-based elements, it has the potential to reinforce deterrence. Contrary to this, the inclusion of space-based weapon systems has significant potential to destabilize deterrence with major nuclear powers (Russia and China in particular), unless they fully participate in such a system.

Regarding the link between missile defense and deterrence for the Chinese/Taiwanese scenario in the third modality, it deserves special attention due to its deep political sensitivity. Importantly, both BMD and TMD systems have the potential to destabilize general deterrence with China if certain preventive and reassuring measures are not taken. It is distinguished between a deescalated situation in which general strategic deterrence between the USA and China works and a crisis scenario in which the USA will have to resort to compellence/deterrence in light of China deterring the U.S. regional involvement over Taiwan. With regard to the former, BMD and TMD ought to be kept as *partly discrete defences* (hence *limited* deterrence by denial in the table) in order not to provoke the so-called defense-offense arms races (an increase in capabilities of the US BMD and/or TMD systems vs. Chinese ways of overcoming them by manufacturing more nuclear-tipped ballistic and/or cruise missiles). As for the latter, US/allied BMD and TMD systems ought to allow quick assemblage into a multilayered system that would perform its deterrent role (limited deterrence by denial) as suggested in the previous discussion. Principal proposals for preventive and reassuring measures to China in this respect are contained in the table, both for BMD and TMD.

[56] Wilkening, D., 1998

[57] Cimbala, S., 2005, page 38

2 POLITICAL DIMENSION

2.1 U.S. Ballistic Missile Defense and Europe

Territorial ballistic missile defence system's development reaches back to the Second World War. Its recent history, however, started to be written after the end of the Cold War, when the declared focus of U.S. projects became protection against limited strikes by states such as North Korea and Iran.[58] To face the threat by the former, the U.S. deployed a system of sensors and interceptors located in Alaska (Fort Greely) and California (Vanderberg AFB); to protect against the latter, consultations about BMD's third site in Europe were started in 2002 with Poland and the Czech Republic by the George W. Bush administration. Formally launched in 2007, negotiations led to agreements (2008) on the deployment of 10 interceptors and an X-Band radar in the two countries. The declared referent security object of BMD Europe were U.S. troops stationed in Europe and European allies' populations, and – should Iran develop ICBMs – possibly also the U.S. territory.[59]

The U.S. plan caused a political thunderstorm. Fearing new political divisions in Europe, a number of NATO Member States particularly resented the (parallel) bilateralism employed in negotiating BMD's third site with Poland and the Czech Republic. Concerns were expressed also about the strategic stability and the risk of new arms races, the expediency of the system against this background and the uncertain nature of Iran's threat, command and control issues and last but not least the detrimental effect on relations with Russia. Indeed, Moscow assumed confrontational posture towards the project (incomparable to reactions to the previous U.S. withdrawal from the ABM treaty, citing changed security environment, or modernization of BMD's early warning systems deployed in Thule and Fylingdales), which it interpreted as aimed against itself, i.e. as an attempt by the U.S. to achieve nuclear predominance, and to militarily expand into what Russia saw as a sphere of special interest.[60]

Therefore, Barack Obama's decision to review the missile defence plans (17 Sept. 2009) had a positive receptionin Western Europeas well as in Russia, but criticism by (predominantly) Atlanticists in Poland and the Czech Republic, who interpreted the move as appeasement to Moscow.[61] Obama's EPAA (*European Phased Adaptive Approach*) was a combined product of an updated assessment of the Iranian threat,[62] technological evolution (negating the former political preference to keep TMD and BMD systems separated) and political expediency. Thus EPAA was to be based on the extension of the existing system of sensors and interceptors originally developed as theatre missile components (*Aegis*) located closer to the foreseen launch sites (while the system's geographical reach should expand gradually, to eventually cover the entire Europe and, in the final stage, increase the protection of U.S. territory against ICBMs). At the political level, the new system was intended to be more acceptable to the American public (because of the reduced costs), NATO's allies (intent was expressed at this time

[58] For a more detailed survey of the U.S. ballistic missile defence history cf. Hildreth, S. and Ek, C., 2007

[59] Cf. Hildreth, S. and Ek, C., 2009

[60] The latter interpretation was reinforced by the geopolitical configuration of the Third Site, dispersed between two CEE countries (while agreements had been signed with Romania and Bulgaria to host other U.S. military facilities). The issue of BMD as demarcating areas of influence was raised in an earlier report commissioned by the European Parliament, cf. Pullinger, S., et al., 2007

[61] NATO Foreign Ministers, meeting in December, however welcomed EPAA as reinforcing "NATO's central role in missile defence in Europe." NATO, 2009a

[62] For articulation of a detailed argument about the threat and regional approach as the appropriate response cf. U.S. Department of Defense, 2010

already to have EPAA endorsed as an alliance capability) and Russia, however roles for countries in Central and Eastern Europe continue to be identified for Phase II (*Aegis Ashore* in Romania) and Phase III (SM-3 IIA interceptors deployed in Poland and Romania).[63]

2.2 NATO Lisbon Summit: Three Syntheses

The U.S. apparent embracement of multilateralism went hand in hand with NATO's internal developments. NATO developed a TMD (ALTBMD) project in the past decade and an intense political debate about BMD took place, which culminated at NATO Lisbon Summit (19-20 Nov. 2010).[64] In the final declaration NATO Member States established NATO BMD as a core alliance objective aimed at protecting NATO's populations, territory and forces and as an integral element of the Alliance's defence posture.[65] In the new strategic concept, it is defined as a core element of collective defence to counter the „real and growing threat" to the Euro-Atlantic area of ballistic missile proliferation, an element that should be based on invisibility of Member States' security and fair sharing of risks and burdens.[66] According to a timeline established at the Lisbon Summit, command and control agreements should be drafted for the March 2011 Defence Ministerial, a draft implementation plan for the June 2011 Defence Ministerial, and a joint analysis on the framework of cooperation in territorial missile defence with Russia for NATO-Russia (NRC) Foreign Ministers' meeting also to be held in June 2011.[67]

The significance of the Lisbon Summit rests in three syntheses essentially defining NATO BMD's future. Ever since the feasibility study was commissioned at the Prague Summit (2002),[68] the issue of linking United States' BMD with the future NATO territorial missile defence stood out. The doors for the linkage, finally established in Lisbon, were formally opened by the Bucharest Summit Declaration (2008),[69] which also foreshadowed the second synthesis, that of building future territorial defense system on the basis of (theatre) ALTBMD, the possibility of which was later outlined at the Strasbourg/Kehl Summit Declaration (2009) and specified at the June 2010 Defence Ministerial.[70] The initial operational capacity of ALTBMD, designed to integrate Member States' sensors and interceptors – including, following the Lisbon Summit, EPAA – in the battle managements, communications, command and control and intelligence system (BMC^3I), was declared in January 2011,[71] and it is expected to be fully operational by 2018. Finally, an invitation to cooperate on the system was issued to Russia (also heralded in Bucharest

[63] O'Reilly, P., 2010

[64] Missile defences were mentioned already in the 1999 NATO Strategic Concept as a means of improvement the defence posture against risks associated with nuclear, biological and chemical weapons' proliferation. NATO, 1999

[65] NATO, 2010a

[66] NATO, 2010b

[67] NATO, 2010d

[68] Cf. NATO, 2002; NATO, 2006. For more details about the study see Kreienbaum, B., 2006

[69] At the same time, U.S. ballistic defense was not endorsed as an alliance capability, but rather as „substantial contribution" to the broader response against ballistic missile proliferation. NATO, 2008

[70] NATO, 2009b; NATO, 2010c

[71] NATO, 2011

Summit Declaration)[72] and a debate on the future synthesis of NATO and Russia's systems took place in NRC.[73]

2.3 NATO BMD: Outstanding Political Issues

The syntheses, facilitated by favourable recent developments such as the "restart" of U.S.-Russia relations, consensus in NATO over the threat of ballistic missile proliferation and missile defence as an appropriate response increased the political feasibility of NATO BMD. Potential benefits for European Member States include increased protection against a ballistic missile threat (rated among the most probable in the report prepared by a NATO group of experts led by Madeleine Albright[74] and described as „the threat of our times" by President Obama in Lisbon[75]) at what is officially claimed a reasonable cost;[76] a potential to stimulate relations with the U.S. against the background of the uncertain future of NATO expeditionary missions and redeployment of U.S. troops to other centres of gravity, provided that an equitable burden-sharing is achieved; economic benefits for local industries; or promoting cooperation with Russia, endowing NRC, and more generally the strategic partnership principle in NATO's new strategic concept,[77] with material content.

The recent progress notwithstanding, there remain several political challenges:

– **The role of Russia**. Historically, regarding the third site Moscow has employed a dual rhetoric of threat (more abstract, as in warnings against „inevitable arms races", or concrete, e.g. deployment of *Iskander* missiles in Kaliningrad, targeting Poland and the Czech Republic etc.) and cooperation (proposals for joint assessment of threat, presence of experts at sites, offering own or rented facilities or keeping the system shut down unless a credible threat emerges).[78] It has continued this dual rhetoric throughout the *rapprochement* following the summer war with Georgia (2008) and after the NATO Lisbon Summit,[79] which leaves NATO policy makers uncertain of Russia's intentions. Whether the sceptics are correct in claiming that Moscow intends to foment dissent within NATO and discipline dissent at home; or whether Russia's concerns about strategic imbalance (i.e. reduced second-strike capability) – driven by the *mutual assured destruction* logic and now seemingly stronger than the former geopolitical claims – or surveillance are genuine, Russia clearly covets a stake in European security architecture, which the U.S. and Europe's Atlanticists are unwilling to grant, as in their view it would undermine Art. 5 of the NATO Charter (nor is the U.S. inclined to share technology with Russia). This elementary problem underlies the

[72] The interest in cooperation was expressed also during subsequent bilateral meetings of Bush and Putin in Sochi (5 April 2008) and Obama and Medvedev in London (1 April 2009).

[73] A working group of NATO and Russia to examine the possible linking of BMD systems was initially established following December 2009 NATO Foreign Ministerial. NATO, 2009a

[74] NATO, 2010e

[75] Quoted in Jane Defence Weekly, 1 Dec. 2010

[76] NATO Secretary-General estimated the expense at EUR 200 million over next 10 years (in addition to continuous ALTBMD investment of EUR 800 million *and* individual Member States' contributions in terms of sensors and intereceptors. On the other hand, NATO's internal study delivered in December 2010 seems to have taken much less conservative estimate. Rasmussen, A., 2010; cf. Hildreth, S., Ek, C., 2011

[77] NATO, 2010b

[78] Cf. Hildreth, C., Ek, C., 2009

[79] Speaking before Russian Duma within days of the Summit, President Medvedev threatened a new arms race should cooperation (i.e. development of „substantial mechanism") on BMD fail. Jane Defence Weekly, 8 Dec. 2010

current dispute over whether the future BMD should consist of a joint system with sectoral commands (Russia), or two loosely linked cooperative systems (NATO). Combined with Russia's lukewarm position towards continuing cooperation on TMD (which Moscow sees as a substitute, moreover modelled on systems' separation, a resisted modality for BMD cooperation), it remains to be seen what Lisbon's *third synthesis* means in practice.

– **Nominal Character of U.S. Multilateralism**. Despite the progressive multilateralization of the U.S. BMD project's consideration in past years, the *modus operandi* of the United States' negotiations on the issue remains that of effective parallel bilateralism. From the *quid pro quo* of the shelved third site for a new strategic arms reductions deal (START)[80] and backing of Iran's sanctions, outlined in a leaked March 2009 letter from Obama to Medvedev,[81] to current bilateral talks on BMD alongside NRC meetings, the U.S. seems to favour the emergence of a strategic condominium over Europe in which NATO's allies are duly informed, but have a limited role to play in their own right.[82] Existence of such condominium (the benefits of which are far from certain for the U.S.), together with technological and industrial issues (see below) raises question about the significance of the *first synthesis*, i.e. the very concept of NATO BMD.

– **NATO Internal Issues**. There remain a number of issues to be resolved in the NATO debate related to the *first* and *second synthesis*. Firstly, there is an outstanding issue concerning NATO's nuclear posture and continued nuclear sharing practice, in particular continued deployment of non-strategic nuclear weapons (NSNWs) in some European countries (Belgium, Germany, the Netherlands and Italy). The debate, in which Germany has been a vocal advocate of denuclearization of Europe, has turned around a lack of conceptual consensus over whether BMD should complement NATO's nuclear deterrence, or should (and whether it indeed *could*) substitute it. It has taken place against the background of Obama's vision of a nuclear weapon=free world (while at the same time the new strategic concept proclaims, in a Hobbesian way, that as long as there are nuclear weapons in the world, NATO will remain a nuclear alliance);[83] the politically sensitive need to modernize the delivery systems in the near future;[84] and differences in assessment of the Russian threat between some states in Central-Eastern Europe and the rest of Europe, led by Germany. NATO European allies' burden-sharing is a second major challenge due to the continent's slow and reactive responses to the U.S. leadership on missile defence, both in political and technological/industrial terms[85] – an issue that has a potential to undermine one of the key benefits for the participating European States, and is addressed in more detail in the next section. At the operational level, command and control issues are likely to be raised in the following debates, possibly ignited by not only technical, but also symbolic considerations.

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[80] New START treaty was signed in Prague on 8 April 2010, and upon ratification in the U.S. Senate (December 2010) and Russian Duma (January 2011) the agreement was finalized on the sidelines of Munich Security Conference on 5 February 2011. McCain Amendment to the treaty obliges the U.S. to deploy EPAA by the scheduled deadline, continue development of BMD, and declares as not legally binding for Washington Russia's earlier statement that in case of unilateral moves on missile defence by the U.S. it would withdraw from the treaty.

[81] New York Times, 2 March 2009

[82] For discussion of the concept cf. Hynek, N., 2009

[83] NATO, 2010b

[84] Thränert, O., 2009

[85] Cf. Buckley, E., 2010

2.4 Missile Defence and the EU

Ballistic missile proliferation has been securitized in key EU documents such as the European Security Strategy (ESS, 2003), within the broader context of WMD proliferation (identified as „potentially the greatest threat" to EU security).[86] The ESS Implementation Report (2008) in particular called for more work on the proliferation of delivery systems, „notably ballistic missiles."[87] EU activities to address the risk has focused, unlike NATO's, on diplomatic means (some of which, notably participation in drafting the 2002 International Code of Conduct against Ballistic Missile Proliferation, predate the ESS) and following the principles of effective multilateralism, prevention, and cooperation with partners.[88]

Two political reasons explain the EU's choice to prefer non-military means in responding to the missile proliferation threat, with consequences for its potential to be involved in a missile defence in Europe. First, missile defence is, by its nature, a collective defence project. While the possibility of EU's common defence was first mentioned in Maastricht Treaty[89] and reiterated in Amsterdam and finally Lisbon Treaty,[90] it has been an anathema to a number of EU Member States which at the same time are NATO members, at least since it became clear in the early 1990s that NATO would survive as a collective defence organization. ESDP therefore assumed complementary tasks, focusing on crisis management and responses to ‚new threats'. The inclusion of the mutual assistance clause into the Treaty on European Union (TEU) with the Lisbon Treaty has changed little in this respect. It is a compromise – tracing its origins to the strained atmosphere following the invasion of Iraq (2003) and the subsequent project of EU structured cooperation ("Tervuren")[91] – among EU's common defence advocates, states that are neutral or in favour of a non-aligned posture, and those with preference for NATO as an ultimate security provider, and hence it features several important constraints. Firstly, it is a mutual *assistance* (rather than *defence*) clause. Secondly, it does not mention military means of assistance, and more generally it is worded in a softer way than originally intended, as a result of the compromise that made possible its extension to all EU Member States. Thirdly, it establishes no mechanisms (in contrast to the solidarity clause,[92] EU institutions are not involved in any formalized capacity) and envisions neither building common capacities nor dedicating national ones (existing or new) for its implementation. Because of its genealogy traced to Western European Union's modified Brussels Treaty (1954) – now expired – and despite its inclusion in primary law, it is a pure intergovernmental mechanism. Fourthly and most importantly, it contains subclauses on the specific character of security and defence policy of certain (neutral) Member States and NATO as a foundation of collective defence and a forum for its implementation for others.[93] In the end, therefore, it leaves a number of issues to be resolved when a first crisis arrives. Political security, energy security or cybersecurity may indeed become subject of states' action legitimized by reference to the mutual assistance clause. But more likely, it may be prove a still-born child, with the potential only to incite the conflict that was conveniently avoided at its inception. In any case, it cannot presently be seen as a step towards EU

[86] European Union, 2003a

[87] European Union, 2008a

[88] Cf. European Union, 2003b; European Union, 2008b; European Union, 2009; European Union, 2010. For an overview of EU's activity in this area cf. Rhode, B., 2010

[89] TEU, Art. J.4

[90] TEU, Art. 24(1) and 42(2)

[91] Cf. Grant, C., 2003

[92] TFEU, Art. 222

[93] TEU, Art. 42(7). Cf. Tiilikainen, T., 2008

common defence, not even if it is conceived merely as a new pillar in the transatlantic security architecture.

Second, the EU's scope of action is limited by the complicated nature of EU-NATO relations at the strategic dialogue level. NATO BMD has been established as an alliance capability in the context of a reinforced Art. 5, but at the same time also against the background of a current conceptual shift between (territorial) defence against the *outside* to the protection of populations and critical infrastructure *inside*. It is a favourable development from the EU's point of view (not least because 94% of EU populations lives in NATO Member States).[94] Furthermore, in the last years Transatlantic security relations have become less strained due to reintegration of France in NATO's military structures (and its limited opposition to autonomous European defence) or rising acceptance of ESDP/CSDP's evolution by the United States (not least because of the check on the evolution through enhanced cooperation of common defence architecture seen as alternative to NATO).[95] But membership issues constrain the potential for EU's involvement in NATO BMD, carry some potential to raise security guarantees issues in the future (only 21 EU Member States are members of NATO), and more immediately aggravate the problems of the NATO-EU strategic partnership – a stalled reunification plan in Cyprus has effected Turkey's blocking NATO's increased formalized cooperation with the EU, whereas the Republic of Cyprus vetoes Turkey's participation in EU defence activities.[96] Potential for practical cooperation in the absence of a political solution, suggested by Baroness Ashton before the Lisbon meeting, is currently probed. But tangible results remain yet to be seen.[97]

That said, should these obstacles be overcome, engagement with NATO BMD would be in the political and economic interests of the EU and its Member States. The CSDP framework could be instrumental in overcoming a collective action problem to bring about a more significant burden-sharing, and catching up with the United States on industrial participation in the missile defence alongside European States contributions in terms of hosting BMD and EPAA elements (*Aegis* deployed on EU vessels, *Aegis Ashore*, sites SM-3 IIA interceptors in Romania and Poland operational by 2018[98] or integration of the already purchased U.S.-manufactured interceptors) or bilateral or minilateral transatlantic co-development and co-production schemes (a failed example of the latter being the recently terminated MEADS). One of the possibilities for increased involvement lie, as the next section argues in detail, particularly in the area of sensor technologies (which incidentally are seen e.g. by France, already developing capacities in this area, also as politically symbolic, providing for more autonomy)[99] and command and control elements.

The CSDP – which might thus come closer to fulfilling the external action's aim to safeguard EU „values, fundamental interests, security, independence and integrity"[100] – should not serve as a framework for a separate missile defence (sub)system, but merely to facilitate Europe's participation in providing for effective protection against the threat of limited ballistic missile attack. Indeed, it is still true even after

[94] European Parliament, 2008

[95] Importance of stronger and more capable EU defence was asserted also in NATO's new strategic concept, while European Parliament had recognized NATO as a core of European security. NATO 2010b; European Parliament, 2008

[96] Cf. Vogel, T., 2010

[97] Agence Europe, 18 Nov. 2010; Vogel, T., 2011. It is not without significance in this context that there has been no EU's position on NATO's Lisbon summit or the new strategic concept. Cf. ed. Vasconcelos, A., 2010

[98] O'Reilly, P., 2010

[99] Gruselle, B., 2010

[100] TEU, Art. 21(2a)

Lisbon Treaty that CSDP instruments, e.g. the new permanent structured or enhanced cooperation,[101] remain focused on crisis management tasks as defined in Art. 42(1) TEU – traditional "Petersberg tasks" – and in Art. 43 TEU (while, at least in theory, the mutual assistance clause *does* internalize CSDP to some extent). Missile defence, however, due to the effective merger of TMD/BMD technologies (the original political preference to keep them separated notwithstanding), may serve not only to guarantee protection for Europe's societies and critical infrastructures, but also as a capacity supporting the traditional out-of-area crisis management operations. It is presently of less importance what the *modus operandi* for deployment of such capacity would be (NATO/EU pooling, currently envisioned for strategic airlift, would be one option); more crucially, it is argued that Europe's BMD as presently conceived is not in any fundamental way disconnected either from the external action's fundamental aim or from CSDP's current foci.

Any future meaningful participation would require redefinition of the role of the institution that is best placed to facilitate the common action on a voluntary basis – European Defence Agency (EDA). It is formally established with the aim of developing defence capabilities (including by contributing to identifying Member States' military capability objectives), promoting research in defence and technology, and building a common industrial and technological base by identifying and, if necessary, implementing useful measures in this respect.[102] However, while it should be playing an increasingly important part in enhanced defence cooperation repeatedly called for by European Parliament[103] or, more recently, by the Ghent Initiative (which identified research and development as one of the particular areas for increased cooperation),[104] member states remain lukewarm when it comes to reinforcing it institutionally, as the freezing of its operational budget demonstrates – it currently stands at a meagre EUR 30.5 million, and Baroness Ashton was unable to press defence ministers even to a modest increase of 2.2%.[105] Furthermore, intensified dialogue with NATO would be necessary, conditional to the general improvement of relations between NATO and the EU, which also should result in a more comprehensive participation. At present, all EU Member States with the exception of Denmark participate in EDA, as well as Norway. Yet it would be pertinent to issue an invitation in due time also to Turkey (called for recently by NATO's Secretary-General)[106] and candidate countries which are NATO Members (this has been suggested by the EP Foreign Affairs Committee),[107] or possibly even other Partnership for Peace members.

The political and economic benefits of contributing to Europe's BMD are plain. The former include, above all, assuming responsibility for protection of Europe's societies and critical infrastructure and facilitating the management of crises in its neighbourhood, while the latter should be seen against the background of the economy drive manifested in the recent "*entente frugale*" between France and the United Kingdom (the two defence cooperation treaties signed on November 2, 2010) and more generally the calls for pooling and sharing of capabilities across the EU. Indeed, a functionalist drive in

[101] European Union, 2004b; TEU, Art. 42

[102] European Union, 2004a; TEU, Art. 42(3) and Art. 45

[103] Cf. European Parliament, 2008

[104] Ghent Initiative, 2010. The paper was later discussed at a formal EU Defence Minister's Council on 9 December, 2010. An inventory of military capabilities is currently under properation for the next Council's formal session scheduled for 24 May 2011.

[105] Agence Europe, 9 Dec. 2010

[106] Agence Europe, 9 Dec. 2010

[107] European Parliament, 2008

the same direction by Europe's transnational defence industries in favour of a more integrated action can presently be observed and should not be underestimated. Moreover, the EDA's role is envisioned here as limited to facilitation of limited cooperation on a voluntary basis – participating States could create *ad hoc* budgets for projects aimed at fostering industrial cooperation in missile defence-related areas. EDA would remain what it is now – a capability development agency.

The Lisbon Treaty granted new powers to the European Parliament regarding CFSP/CSDP.[108] The EP should use those powers to foster debate on the involvement of European countries in the missile defence to the benefit of EU's security through a common action. The EDA is particularly suitable to facilitate the enhanced cooperation in this area but other possible actions and scenarios should be however also considered. Firstly, the EU's industrial competitiveness should continue to be enhanced through industry and research cooperation in the area of security and space in the 8th Framework Programme, allocations for which will be decided in 2013. In this way, the development primarily not of military systems, but of means of civilian protection and critical infrastructure security should be supported to increase the resilience of EU societies against possible ballistic missile attacks. Yet resources in this chapter have indeed been used for the development of surveillance technologies such as GMES (Global Monitoring for Environment and Security) which are designed for use also in CSDP operations (GMES funding has accounted for 85% of F7's allocation for security and space research). This betrays a more general trend towards a policy involving the militarization of space (now for the first time incorporated in European law),[109] so far mainly through development of dual use technologies, including Galileo, but also notably in the project of the EU Satellite Centre (EUSC).[110] This way of enhancing cooperation in missile defence has indeed been discussed in policy circles, and may in the future be taken for individual projects (early warning, radar cueing, point-of-impact location, or more generally improving intelligence and reconnaissance on ballistic missile programs and proliferation).[111] However, normative issues related to the militarization of space and a lack of clear connection to the current crisis management aims of EU defence policy may pose additional difficulties to those encountered in EDA's case. Increased cooperation on missile defence might arise also from the recent defence agreements between France and the UK (which mention research and development of sensors). These could turn to be vehicles of change outside the EU's structure (unlike St. Malo was once), featuring various other states gravitating around this new core in different areas, some related to missile defence technologies. In theory, a permanent structured cooperation could even emerge in time for investment in defence equipment,[112] but presently it seems equally plausible that the new *entente* could effectively slow down the defence participation and cooperation elsewhere on the continent.[113]

[108] TEU, Art. 36
[109] TFEU, Art. 189
[110] For a critical view cf. Slijper, F., 2008
[111] Cf. Ritter 2008
[112] TEU, Art. 42(6), Art. 46; and Protocol on Permanent Structure Cooperation established by Article 42 TEU, in particular Art. 2
[113] Witney, N., 2010

3 INDUSTRIAL DIMENSION

3.1 Strengthening the European Defence, Technology and Industrial Base

There is an evident discrepancy between U.S. and European missile defence capabilities. This characteristic could complicate future cooperation and constitutes a considerable obstacle to burden sharing. At the same time, however, missile defence provides a unique opportunity for mitigating the transatlantic industrial and technological gap. It has been already understood that the missile defence project could become one of the pillars of the transatlantic political partnership. This part would like to emphasize that it may also provide a crucial stimulus for the recently developing processes of strengthening the European Defence Technology and Industry Base (EDTIB). In this regard the issue of missile defence essentially exceeds the area of high-level strategic technologies produced by the large corporations and involves also the level of small and medium enterprises (SMEs).

Following on the role of EDA in the missile defence project that was tackled in the previous part, this section would like to emphasize its role from the EDTIB's point of view. EDA has established a working group on Energetic, Missiles and Munitions (GEM – 2) which operates under the Research and Technology Directorate. The GEM-2 includes some important industrial players in the field (e.g. MBDA, Diehl,.) but the projects pursued by this group are on a very low strategic level. However it should be understood that EDA is not a platform for strategic discussions on the involvement in the high-level missile defence project but rather an actor that has a potential to translate the high-level strategic achievements on the SMEs level and similarly promote the SMEs capabilities as possible supply chains for larger contractors. In fact, EDA could become an important actor extending the potential technological and industrial benefits from the missile defence involvement to the European SME EDTIB.[114]

3.2 Existing Missile Defence Systems

It appears to be essential to introduce the existing U.S. complex system to provide a context for the possible European involvement. The European industrial and technological base offers significant capabilities, which have a potential to complement U.S. capabilities within the integrated framework of territorial and theatre missile defence system. This potential will be addressed below after the introduction of U.S. systems and of the European Phased Adaptive Approach that outlines the American strategy of dealing with the European territorial defence.

3.2.1 Ground-based Midcourse Defense (BMD)

This element of the ballistic missile defence currently protects the US against the intermediate and long-range ballistic missile threats. The system is fully functional and includes complex technology capable of detecting, tracking, and destroying adversary missiles. The ground-based interceptors are based on a hit-to-kill technology and intercept the target in the midcourse battle space. The EKV (Exo-atmospheric Kill Vehicle) interceptors are three-stage, solid fuel boosters using only kinetic energy to destroy the missiles above the Earth's atmosphere.[115]

The BMD are at present emplaced at two sites – Fort Greely, Alaska and Vandenberg Air Force Base, California. There were 30 interceptors deployed by the end of 2010 and the Missile Defence Agency (MDA) has seemed to revaluate its former plan to increase their number to 44.[116] The third site, as noted

[114] Interview with Dinesh Chandramouli Rempling, European Defence Agency, January 2011
[115] Missile Defense Agency, *Aegis Ballistic Missile Defense*
[116] Center for Defense Information, 2009

in the previous part, was originally planned to be set up in Central Europe. Boeing is the prime contractor for the BMD programme, however the kill vehicles are produced by Raytheon.[117]

3.2.2 Patriot Advanced Capability 3 (PAC-3)

PAC –3 is a lower-tier missile defence land-based system that is built upon the PATRIOT air and missile defence technologies.[118] The system is designed to offer protection against cruise missiles, and tactical (short-range) ballistic missiles. PAC-3 is a complex system that includes battle management, command, control, and communications center, radar system, launcher and interceptors. The PAC-3 interceptors are based on a hit-to-kill basis, although the former generation PAC-2 used exploding warhead to eliminate the target.[119]

The PAC-3 missiles use a solid propellant rocket motor and are mounted on mobile launchers each consisting of 16 interceptors. The system (combined PAC – 2/3) was used in the first US military engagement in the Persian Gulf in 1991 and the PAC-3 during the Operation Iraqi Freedom.[120] Generally, apart from the US the Patriot system is in service also in Egypt, Germany, Greece, Israel, Kuwait, the Netherlands, Saudi Arabia, and Taiwan. The latest PAC-3 capabilities were sent to the Netherlands, Japan, Kuwait, United Arab Emirates and Taiwan under foreign military sales (FMS).[121]

The PAC-3 has been integrated with the Terminal High Altitude Area Defense (THAAD, see below) to form a multi-tier (below and above 40 km) theatre defence against missile threats in the terminal phase of flight.[122] Additionally, the PAC-3 Missile has been selected as the primary interceptor for the multi-national MEADS program (see below). The prime contractor of the PATRIOT system is Raytheon.

3.2.3 Terminal High Altitude Area Defense (THAAD)

The THAAD is a complex land-based MD system potentially targeting missiles inside or just outside the atmosphere (generally just above the reach of the PAC-3). Its interceptors, grouped by eight in a truck-mounted launcher, use a hit-to-kill technology eliminating adversary missiles in higher altitudes and thus mitigating possible effects of WMD. The system also uses Army Navy/Transportable Radar Surveillance (AN/TPY-2), which is the world largest air-transportable X-band radar.[123]

Additionally, the THAAD is able to interface with other US or allied air defence systems due to the advanced battle management and command, control, computers and intelligence (BMC3I) units. The system is still under development and testing, although the first THAAD battery has been fielded in May 2008 followed by the second battery at Fort Bliss, Texas in October 2009. The Presidential Budget Request mentions a total of 9 THAAD Batteries to be made operational by 2015.[124] The prime contractor

[117] The BMD Joint Venture include Boeing, Raytheon, Orbital Science Corp, and Nothrop Grumman
[118] Missile Defense Agency, *PATRIOT Advanced Capability-3*
[119] Global Security.org, *Patriot Advanced Capability-3 (PAC-3)*
[120] The previous report on MD requested by the European Parliament mentions only the first conflict where the intercept rate was quite low. Cf. Pullinger, S., et al., 2007. The results in the OIF were much more satisfactory as the system engaged and eliminated all 9 Iraq's threatening missiles launches. Cf. Gormley, D., 2004, p. 61; Anderson, C., 2004.
[121] The FMS program is the government-to-government method for selling U.S. defense equipment, services, and training aiming at strengthening bilateral defense relations, supporting coalition building, and enhancing interoperability between U.S. forces and allied militaries.
[122] Missile Defense Agency, *PATRIOT Advanced Capability-3*
[123] Missile Defense Agency, *Terminal High Altitude Area Defense*
[124] Lockheed Martin, *THAAD*

for the THAAD is Lockheed Martin, while AN/TPY-2 radar is produced by Raytheon and the BMC3I unit by Northrop Grumman.[125]

3.2.4 Aegis Ballistic Missile Defence

The Aegis system constitutes a complex sea-based system. It combines the Standard Missile-3 (SM-3) capability to intercept short- to intermediate-range missile threats in their midcourse-phase with the SM-2 hitting short-range ballistic missiles in their terminal phase. The ships equipped with the Aegis system managed to detect and track all kinds of ballistic missiles including the ICBMs and to share the data with the other land-based systems discussed above. The Aegis BMD is placed on 21 U.S. Navy ships that operate in the Pacific (16) and Atlantic (5). Another 6 cruisers should be equipped with the Aegis in 2011 and sent to the Atlantic. By the end of 2013 the MDA and the Navy plan to deploy 32 Aegis ships.

It will be shown below that the Aegis is a crucial element in the MDA's European Phased Adaptive Approach.[126] Within this programme the sea-based system will be combined with the future land-based component, the so-called Aegis Ashore, which will also be based on the upgraded SM-3 capabilities. The Aegis will be a principal system offering both theatre and ballistic missile defence. Following the Europe-oriented initiative the Aegis budget increased fundamentally due to the increased inventory. In FY 2010 the planned inventory of 147 SM-3 missiles was raised to 329 missiles and will further increase to 436 pieces by 2015.

Japan has purchased the system under the FMS and developed SM-3 Cooperative Development Programme with the U.S., which should result in the upgraded SM-3 IIA technology focusing on longer-range ballistic missile threats. Similarly, the MDA has announced the plan to develop SM-3 IIB missiles that should dispose of an early intercept against long-range missiles.[127]

Raytheon is a producer of SM technology, although some parts of this technology (vertical launch system) as well as of the entire Aegis system (radar and communications systems) are produced by Lockheed Martin.

3.3 European Phased Adaptive Approach: A Technological Perspective

3.3.1 An Overview

The overview of the existing MD systems was necessary for a better understanding of the European Phased Adaptive Approach.[128] This section will further broaden the political perspective and will focus on the technological side of the issue. As previously shown, the U.S. partially adjusted the budgetary propositions to acquire enough TMD and BMD potential to provide protection of the European periphery. Additionally, the recent upgrades of the entire U.S. MD architecture are very well interconnected in all elements and effective in all layers.[129] This development makes the European technological and industrial involvement rather more difficult, although it is clear that both political as well as industrial success will have to be based on a transatlantic basis. The clear understanding of the current state of art is perceived as the first step.

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[125] The THAAD Joint Venture include Lockheed Martin (lead), Raytheon (radar), Pratt and Whitney Rocletdyne (missile), BAe Systems (sensors), Northrop Grumman (BMC^3I).
[126] Missile Defense Agency, 2009, *The Phased Adaptive Approach*
[127] U.S. Department of Defense, 2010
[128] Missile Defense Agency, 2009, *The Phased Adaptive Approach*
[129] U.S. Department of Defense, 2010, pages 19-26.

The European Phased Adaptive Approach first counts with the contribution to the missile defense of NATO Europe by providing upper tier missile defence system (above-mentioned Aegis BMD with the AN/TPY-2 forward-based radar, originally part of the THAAD element). This system would be capable of intercepting medium-range and intermediate-range ballistic missiles. The lower tiers missile defence systems should be developed by U.S. and European NATO allies and integrated with the existing U.S. territorial defence systems through the expansion of NATO's ALTMBD command and control system. It should be noted that the command and control system is the only element of the future European missile defence that will be covered by the NATO budget.

3.3.2 Phase 1

The first phase starting in 2011 should result in providing the initial protection of Southern Europe against the short- and medium-ranged ballistic missiles based on Aegis interceptors and radars combined with AN/TP-2 radar capability. As mentioned above the Aegis ballistic missile as well as sensor capacities are being increased and forwarded to wider European territory. The MDA has also upgraded the Command, Control, Battle Management and Communication (C^2BMC)[130] that was already connected to European Aegis operations and which is now fully interoperable with the ALTMBD.[131] It should be also recalled that that all phases include certain steps aiming at strengthening the BMD (especially the deployment of SM-3 IIB during the Phase 4).

3.3.3 Phase 2

During phase 2, the European Aegis system will be further developed through the deployment of the SM-3 Block IA/B at sea and an Aegis ashore site in Romania. In 2015 the sensor system should be enriched by the airborne sensor system carried on Remotely Piloted Vehicles (RPVs) which will also require adjustments to the C^2BMC.[132] All these projects have naturally already been awarded to the U.S. contractors (namely Lockheed Martin).

3.3.4 Phase 3

The third phase will rest upon the deployment of the SM-3 IIA interceptors, which are in the process of being developed in the U.S. – Japan programme, on the land sites in Poland and Romania. After 2018, consequently, NATO European countries will be protected against short-, medium-, and intermediate ballistic missile threats. Deploying the Precision Tracking Space System (PTSS) will further develop the sensor element[133] together with the Airborne infrared (ABIR) technology[134] which is supposed to be more effective in tracking and discriminating hostile missiles. The PTSS concept already shows compatibility with Aegis, THAAD as well as BMD capabilities. Again, the next phase will also require a next generation of C^2BMC capabilities, which is under research since 2010.

3.3.5 Phase 4

By 2020 the MDA counts with the deployment of SM-3 IIB that will have an early intercept capability and hence will be able to intercept medium-, intermediate-range ballistic missiles and potentially also

[130] The C^2BMC Joint Venture includes Lockheed Martin Mission Systems (prime contractor), Nothrop Grumman, Boeing, Raytheon, General Dynamics.
[131] O'Reilly, P., 2010, page 5.
[132] O'Reilly, P., 2010, page 7.
[133] The system will provide a midcourse ballistic missile-tracking capability in orbit and will be based on former space tracking and surveillance system developed by Northrop Grumman.
[134] This sensor is developed by the German IABG and DIEHI Defence companies.

intercontinental ballistic missiles. From the U.S. perspective the SM-3 IIB will serve as the first layer against the ICBMs, while the BMD (Alaska, California) will provide second layer protection.[135]

3.4 Possible European Industrial Involvement

3.4.1 European Common Approach Advisable

The analysis of the current U.S. technologies and plans revealed that both spheres are well elaborated in terms of deployment of the elements that by 2020 should provide a complex protection of (NATO) European territory against all type missiles. The next section will suggest some segments in which the EDTIB is efficient and could become engaged in the process of the European missile defence system development. Generally, three possible scenarios of the European approach towards the MD can be outlined, however two of these appear to be irrelevant. The first is the hypothetical option that European countries would develop its own predominantly non-U.S. technology-related system. It will be shown bellow that some European enterprises dispose of certain technologies but there is obviously no need to elaborate on this non-realistic scenario. The second would be the technologically straightforward possibility based on the off-the-shelf purchase of American systems. This scenario is a non-issue as well since NATO member states will have to pay for the MD systems and it is apparent that potential major European contributors would condition their participation by demanding stakes for European companies (not to mention the unique opportunities connected with project and stressed several times in this report).

The preferred solution should be apparently based on the shared transatlantic cooperation. The crucial tasks for the European allies lies in their ability to offer relevant alternatives and options for the field dominated by the U.S. It has been already argued in this report that it appears to be advisable for the European countries to try to develop a common approach to any possible extent.[136] This process cannot be based on a purely political initiative. It must also encompass the key industrial players and in should evolve in a mutually stimulating fashion. The following part will offer a closer look at the potential European capabilities and will identify important industrial actors that should enter into the strategic dialogue.

3.4.2 "ALTMBD Approach"

NATO has already taken one of the crucial decisions according to which the territorial missile defence will be developed as an extension of the ALTMBD command and control (C2) capabilities. The important consequence of this decision is two fold. Firstly, there is a strategic goal of creating a common C2 architecture for the entire integrated missile defence system. The C2 unit basically "glues" the entire system together and provides a gate to the crucial strategic information regarding threats and responding actions. Secondly, the respective capability for the ALTMBD has been already developing through the transatlantic cooperation. Therefore it is possible to argue that the European orientation on this capability is strategic (given the place of the unit in the missile defence architecture) and technologically and industrially promising (given the European capabilities and current cooperation).[137]

3.4.3 Command and Control system

[135] O'Reilly, P., 2010, page 10.

[136] Interview with Gert Runde, Director Security and Defence, AeroSpace and Defence Industries Associations of Europe, Brussels, January 2011

[137] Interview with Gert Runde, Director Security and Defence, AeroSpace and Defence Industries Associations of Europe, Brussels, January 2011

Referring to the latter point NATO has developed an air defence C2 system Air Command and Control System (ACCS) that should be upgraded to integrate air and missile defence C2. Such architecture would direct the operational Battle Management and Command, Control, Communications and Intelligence (BMC^3I) planning, tasking and controlling the execution of missions. Currently, there have been several inter-connected transatlantic consortia dealing with this issue.

The *Air Command Systems International (ACSI)* established by Raytheon (US) and Thales (France) has been involved in developing the ACCS. The entire *ACSI* structure is also part of a larger *Science Application International Corporation (SAIC Team)* that was one of the contractors for working on the missile defence feasibility study and that has continued in providing expertise in the area of missile defence architecture. Apart from ACSI the consortium includes Boeing and several major European companies – EADS Astrium (France), DIEHL, IABG (Germany), or QinetiQ (UK).[138] Most importantly, the *Thales Raytheon Systems* is another joint venture working on the ACCS for the theatre missile defence component of ALTMBD.[139] The programme also encompasses the German branch of EADS, IABG, Selex (Italy) and Lockheed Martin (US).

It should be stressed that this essential part of the future architecture is the only one that has been covered by the NATO budget. The total costs are estimated to reach 1 billion USD while the first quarter has already been spent. The common NATO funding has certainly facilitated the transatlantic cooperation but the existing structures could serve as fundaments of future projects funded from national resources.

3.4.4 Acquisition/Business Model

It has been already suggested that that the command and control systems have been developing in a distinct regime. The other decisions regarding the development and acquisition will require different strategies that are not generally exclusive. The ALTMBD approach would suggest that the participating countries would fund their own national contributions while NATO would cover only systems, which "glues" the parts together. The other option is right the opposite, based on the overall responsible structure dealing with the procurement process. The last option, recommended by the authors of this report, lies in between while suggesting searching for the common multinational solutions, if possible.[140]

The other essential related question is connected with the responsibilities over the acquisitions. Apparently, the crucial issue at stake is the integrity and interoperability of the entire system. Therefore, it appears to be appropriate to select a single responsible contractor for both the national and the multinational contribution to the architecture. Given the nature of the problem it should be expected that the single contractors would build their own cooperative/supply structure. The next part will try o identify key European industrial players in various missile defence components, which could play an important role in (co-)developing the system.

3.4.5 Upper Layer Systems

The part dealing with the existing U.S. missile defence technologies has shown that the MDA has developed two upper layer missile defence systems – the land-based THAAD and the sea-based Aegis BMD. According to the EPAA the latter system should complemented by the land-based component Aegis Ashore that should be based on the upgraded SM-3 technology (the second generation IIA

[138] SAIC, *About SAIC*; PRNewswire, 26 October 2005
[139] THALES, 2010
[140] Interview with the NATO officials, Brussels, January 2011

technology is being developed in cooperation with Japan and the MDA has already announced a plan for an early intercept generation IIB).

From the European perspective there seems to be only one potentially relevant technology being developed by the MBDA Missile Systems. The concept is called Aster Bloc II and it is based on the existing Aster lower-level interceptor technology.[141] The Aster Bloc II should be fully interoperable with and complementary to both SM-3 and THAAD systems. The EADS Astrium has announced the programme of exoatmospheric interceptor Exoguard but it exists only on conceptual level.[142]

3.4.6 Lower Level System

The U.S. lower-tier missile defence is based on the Patriot Advanced Capability (PAC-3) that has been widely deployed in Europe, Egypt, the Arab peninsula or Japan. The upgraded PAC-3 technology was one of the goals of the *Medium Extended Air Defense System (MEADS)*. The MEADS is a cooperative programme developed between Lockheed Martin and the German and Italian branches of the MBDA consortium. It aimed at producing a highly mobile and flexible theatre missile defense with the 360-degree protection against short-range ballistic missiles, cruise missiles and UAVs. As mentioned, the system should replace the Patriots and Hawks with the upgraded PAC-3 technology (so called MSE – missile segment enhancement).[143] However, the development of MEADS has been accompanied by significant budgetary problems and lack of cooperation will, which suggests an uncertain future for the programme.

The PAC-3 land-based technology can be complemented by the SAMP/T programme, which is developed by a joint venture of MBDA FR, MBDA IT and Thales. The same joint venture also produces see-based PAAMS programme, which is also part of Aster missile family.[144]

3.4.7 Sensors and Radars

The field of sensors and radars is already very complex but it is still quite possible to identify potential leaders in this area. The Thales (France) has been producing various radars including the Ground Master (GM 400)[145] and M3R long range anti-ballistic tracking and firing radar[146], both developed within the TRC consortium, the ARABEL, which is part of the ground-based SAMP/T system[147] or the recently developing Ground Smarter (GS1000) radar.[148] At the Lisbon summit the Thales group also announced that it will set up a space-based early warning radar system by 2020. The Thales (Netherlands) is producing a sea-based detection and targeting early warning radar (Smart L-EW).[149]

The Baesystems offers the early warning and control system (EWACS)[150] or naval S185M long range radar[151]. The German IABG and DIEHl Defence companies have developed the Airborne infrared (ABIR) radar, which is to be deployed within the Phase 3 of the EPAA. The EADS Astrium has also been working

[141] Interview with Mr Gondallier de Tugny, EU/NATO Affairs Director, CEO Office, MBDA Missile Systems, January 2011
[142] The Astrium is a aerospace subsidiary of the EADS consortium focusing on mainly on space transport (e.g. Arianne) and various satellite solutions. See, ASTRIUM, *Programmes*
[143] Army-Technology.com, *MEADS Medium Extended Air Defence System*
[144] MBDA, sensors
[145] THALES, GM 400
[146] ThalesRaytheonSystems, 2003
[147] THALES, Arabel
[148] THALES, GS1000
[149] SMART-L, 2011
[150] BAESYSTEMS, Land Radar
[151] BAESYSTEMS, Naval Radar

on the space-based infrared early warning system SPIRALE.[152] Finally, the Italian SELEX produces the 3D radar long-range radar for NATO [153], as well as the EMPAR radar deployed on Horizon Class frigates.[154]

[152] Spirale, 2010
[153] SELEX, 2010
[154] Empar, 2006

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