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Dynamics of Pakistan's Ballistic Missile Acquisition

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Abstract

Arms dynamic studies are concerned with explaining the causes and consequences of state's decision to acquire arms. Such studies are dominated by two opposing models. *First*, the *action-reaction model*, which posits a state's decision to acquire arms as a rational response to external threats and consequently it enables them to deter belligerent adversaries. *Second*, the *domestic structure model*, which holds that arms acquisitions are an outcome of domestic interests and consequently create instability and strain political relations. Traditionally the two models have competed for exclusivity in explaining armament phenomena. However, more recent studies argue that they are, in fact, not mutually exclusive but *complementary* to each other. The basic underlying assumption of these studies is, while external security threats may provide a rationale for a state to acquire arms the scale and manner by which the state arms itself will be determined by domestic forces.

The basic generalisations for the two models have been extracted from the armament dynamics of the Cold War superpowers or the major arms producing states from the Western Hemisphere or Global North. In the case of less industrialised weapons producer like Pakistan the literature takes a narrow approach, identifying its behaviour as congruent with action-reaction model and downplaying the importance of domestic-structure model. This thesis argues that not only the action-reaction process in the case of Pakistan's ballistic missile competition vis-à-vis that of India is less understood but domestic factors have also played a crucial role in the ballistic missile acquisition. In accordance with this argument this thesis hopes to conduct a twofold analysis into the *external* and *internal* dynamics of Pakistan's ballistic missile acquisition. The research postulates that while external threats have provided rationale for Pakistan's ballistic missile programme, domestic factors have intervened to influence certain missile developments in the programme.

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Abbreviations

ABM	Anti-Ballistic Missile
ACDA	Arms Control and Disarmament Affairs (Directorate)
AFSFC	Air Force Strategic Force Command
ALCM	Air Launched Cruise Missile
ARM	Action-Reaction Model
ASFC	Army Strategic Force Command
AWC	Air Weapons Complex
BJP	Bhartiya Janata Party
BMD	Ballistic Missile Defence
BRBM	Battlefield-Range Ballistic Missile
C^2	Command and Control
CAS	Chief of Air Staff
CBM	Confidence Building Measure
CCNS	Cabinet Committee on National Security
CD	Combat Development (Directorate)
CJCSC	Chairman Joint Chiefs of Staff Committee
CMD	Credible Minimum Deterrence
COAS	Chief of Army Staff
DCC	Defence Committee of Cabinet
DESTO	Defence Science & Technology Organization
DPSA	Deep Penetration Strike Aircraft
EA&R	Evaluation, Analysis, and Research (Cell)
EME	Electric Mechanical Engineer
ERL	Engineering Research Laboratories
FSC	Full Spectrum Deterrence
GHQ	General Headquarters
IAEA	International Atomic Energy Agency
IAF	Indian Air Force
ICBM	Intercontinental-range Ballistic Missile
IGMDP	Integrated Guided Missile Development Programme
DSM	Domestic Structure Model
IJI	Islami Jamhoori Ittehad
INFRUS	India-France-U.S.
IRBM	Intermediate-range Ballistic Missile
ISI	Inter-Services Intelligence
JSHQ	Joint Staff Headquarters
KRL	Khan Research Laboratories
MO	Military Operations (Directorate)
MOD	Ministry of Defence
MOFA	Ministry of Foreign Affairs
MRBM	Medium-range Ballistic Missile
MTC	Maritime Technology Complex
MTCR	Missile Technology Control Regime
MLV	Multi-Tube Launch Vehicle

NCA	National Command Authority
NDC	National Defence Complex
NESCOM	National Engineering and Scientific Commission
NPT	Non-Proliferation Treaty
NSFC	Navy Strategic Force Command
NSG	Nuclear Suppliers Group
NTG	Neue Technologien GmbH
PAEC	Pakistan Atomic Energy Commission
PAF	Pakistan Air Force
PCNS	Parliamentary Committee on National Security
PMO	Project Management Organization
PNE	Peaceful Nuclear Explosion
POF	Pakistan Ordnance Factory
PPP	Pakistan People's Party
RRM/NRRM	Risk Reduction Measures/Nuclear Risk Reduction Measures
SFC	Strategic Force Command
SLBM	Submarine Launched Ballistic Missile
SLCM	Submarine Launch Cruise Missile
SSBN	Nuclear Ballistic Missile Submarine
SLV	Space Launch Vehicle
SPD	Strategic Plans Division
SRBM	Short-range Ballistic Missile
SUPARCO	Space & Upper Atmospheric Research Commission
SSN	Nuclear Attack Submarine
SWO	Special Works Organization
TNW	Tactical Nuclear Weapon
OTRAG	Orbital Transport und Raketen Aktien Gesellschaft
USAF	United States Air Force

CHAPTER 1: ARMS DYNAMICS – THEORETICAL PERSPECTIVE

The generally accepted definition of weapons acquisition refers to the research, development, production, and procurement of a weapon system (Farrell, 1997, p. 1). Studies into weapons acquisition are fundamentally concerned with the question of *why states acquire arms? how they acquire them?* and *what is the outcome of weapons acquisition?* Academic deliberations on these questions are largely dominated by the debate surrounding "arms race" phenomenon. Most pre-1945 arms races have mainly been viewed as quantitative in character. The academic studies into their determinants have similarly followed a quantitative approach. One of the most influential works on quantitative arms race has been the mathematical models proffered by British mathematician Lewis F. Richardson (1960). The model seeks to explain competitive armament processes between two states and how they can escalate into a war between them. Richardson's theoretical framework and equations, and other quantitative works that have similarly followed his footsteps, have interpreted arms race as an *action-reaction* relationship between states, which eventually spirals into a war.

The quantitative methods for studying arms race phenomenon have largely relied on analysing factors such as the number of weapons on each side and/or military budgets of the states involved in the arms race. These methods are, however, not without their limitations and criticism. Concerns are particularly raised on the reliability of their findings or conclusions. Juergen Dedring (1976, p. 76), for example, argues that it is relatively simple to collect military budget data, but the reliability of the findings is somewhat uncertain because the direct translation of the budget data – or other similar figures – into conflict behaviour dimension is subject to considerable doubt, due to the impact of many other elements that enter into the cognitive and perception screening process of the decision-makers in the interaction.

The subsequent Cold War arms race phenomenon has, however, been viewed as consistently qualitative in character due to extensive innovations in the military technology (Albrecht et al., 1972; Senghaas, 1979; Thee, 1978). The introduction of nuclear weapons is argued to have further eroded the pre-nuclear standards of the calculability of the consequences of military action (Dedring, 1976, p. 76). The academic concepts and theorems for explaining the technology driven qualitative arms races have therefore accordingly taken

a qualitative approach. Today *arms dynamics* – encompassing wide range of lexicons besides arms race, i.e., arms acquisition, arms build-up, arms competition, arms rivalry, arms maintenance, etc. – are largely explained in terms of two basic qualitative paradigms or models. The first is the qualitative *Action-Reaction Model* (ARM), which much like its quantitative counterpart exclusively seeks the determinants of arms dynamic in the competitive relationship between states (Buzan & Herring, 1998, p. 81). The second is the *Domestic Process* or *Domestic Structure Model* (DSM), which seeks to locate the determinants of armaments within the structure of the state – i.e., its economic, organisational/institutional, and political workings (Buzan & Herring, 1998, pp. 81–82; Glaser, 2000; Gray, 1971).

ARM is the dominant model for arms dynamics studies. The model is based on neorealist concepts and theorems and places primacy on states functioning in the anarchic structure of the international system and on external factors as the determinants of their weapons acquisitions (Buzan, 1987, pp. 76–77). The metaphor of *action-reaction* is self-explanatory; states strengthen their armament because of threats they perceive from other states (Buzan & Herring, 1998, p. 83). Though oversimplistic in definition at first glance, scholars of arms race present a complex explanatory framework for ARM, particularly relating to timings or types of reactions and their causal triggers.

Johan Holst (1969, p. 162), demonstrates two distinct timings or types of reactions, i.e., *sequential reactions* that follow adversary's actions and plans or *anticipatory reactions* that precede or coincide with adversary's actions or plans. Colin Gray (1971, pp. 72–73), highlights four distinguishable classes of triggering events, (1) a military-technological trigger internal to the arms race system; (2) a political trigger internal to the arms race system; (3) a military-technological trigger external to the arms race system; (4) a political trigger external to the arms race system. In essence, military-technological and/or political changes internal to the relations between principle states involved in the arms race can trigger reactions, or military-technological and/or political changes external to the relationship between principle states involved in the arms race can trigger reactions. In the second instance, behaviour and interaction of the allies with the principle states could trigger reactions from the adversaries.

The reactions are argued to be based less on any real time or accurate intelligences and more on states' threat perceptions and assessments regarding their adversary's intentions and capabilities. Given that most military instruments can be used for offensive as well as defensive purpose also makes it difficult for states to distinguish between measures other states take to defend themselves and measures, they may be taking to increase their capability for aggression. Because the consequences of being wrong may be very severe, it is a common dictum that prudence requires each state to adjust its own military measure in response to a worst-case view of the measures taken by others (Buzan & Herring, 1998, p. 85). For these reasons, more than often reactions, particularly anticipatory ones, turn out to be overestimated, exaggerated, and premature (Mahnken, 2016, p. 271; G. W. Rathjens, 1969).

Some proponents of ARM present its workings as mechanistic or systematic reciprocal process where actions 'necessarily' trigger reactions on the other side. To quote Robert S. McNamara, who is generally considered as the "high-priest" of superpower action-reaction arms competition, "whatever be their intentions – whatever be our intentions, actions – or even realistically potential actions – on either side relating to the build-up of nuclear forces, be they either offensive or defensive weapons, necessarily trigger reactions on the other side" (Gray, 1971, p. 72). The logic of 'necessary' reaction embeds ARM with a complex spiralling security dilemma. Many of the means by which a state tries to increase its security decrease the security of other (Jervis, 1978, p. 169). The other state is then likely to react to having its security reduced, which in turn may result in a decrease rather than increase in the original state's security. The original state may then, as a reaction of its own, undertake measures to offset its reduced security (Buzan, 1987, p. 78; Glaser, 1997, p. 174). In this sense, action-reaction puts into motion a process where reactions are met still by another reaction, resulting in an endless arms race (Glaser, 2000, p. 253). Many assume security dilemma to be an inescapable reality. Buzan (1987, p. 79), however, suggests that the repetitive pattern could end if one side gives up, or a new balance acceptable to both sides is reached, or the issue is resolved by war. Rathjens (1969, p. 20), indicates that economic issues could restrain an otherwise limitless arms race.

Arguments favouring mechanistic or systematic reciprocal process, necessary reactions, and security dilemma features of ARM, however, fail to account for the reaction time-lags and other sequences of states' armament behaviours, such as *action-inaction* or *inaction-action*. According to Wohlstetter (1974, p. 10), "depending on trade-offs with other aims, overestimates or underestimates might discourage or stimulate a response. One side anticipating a major program[sic] by the other might give up action of its own. And if it anticipates inaction by its adversary, it may itself be tempted to act." The two sequences raise an important notion that states can be tempted to acquire arms independent of adversary's actions and potential reactions, putting the relevancy of the ARM's explanatory framework in flux. The proponents of the second model, i.e., DSM, have attempted to address this notion by seeking answers within the state structure.

As an antithesis to ARM's emphasis on *proliferation of armaments* in the international system the DSM shifts focus to *proliferation of armament-oriented interests* within a state's structure (Senghaas, 1979, p. 10). The debate into DSM gained credence with the U.S. President Dwight D. Eisenhower January 1961 speech in which he warned against the 'unwarranted influence' accrued by the *military-industrial complex* (MIC), underscoring that industrial and military elites pursued their own interests at the centre of the state by stoking arms race (Maiolo, 2016, p. 3). Subsequent academic studies, particularly in *peace research*, have not only upheld the concept of MIC but have sought to further refine it to posit wide ranging concepts and theorems in favour of DSM.

Dieter Senghaas' (1969, p. 176, 1974, p. 45) concept of *autism* has been highly influential in this regard. Autism exists when military behaviour is generated more by internal considerations than by any rational response to external threats (Buzan & Herring, 1998, p. 101). In fact, in Senghaas (1979, p. 8) views the "action-reaction scheme is … highly dubious, if not completely false." The weapons acquisition is determined by factors internal to the state, and if need be, external threats will be manufactured to bolster domestic unity. Military capability may be acquired more for prestige, or to reinforce the government's hold on the country, than in relation to external threats (Buzan & Herring, 1998, p. 101).

According to the autism theory arms dynamics is determined by two domestic phenomena, (a) domestic alliance of interests, and (b) technological impulse for innovation,

both of which are highly intertwined (Köhler, 1979, p. 121). These phenomena underscore the existence of internal-domestic interests based alliance that is more multifaceted than Eisenhower's MIC, comprising not just the military and arms industry but also political authority, scientific organisations, and other interests groups as key players (Glaser, 2000; Gray, 1971; Sagan, 1996; Thee, 1976), or as Senghaas (1979, p. 10) phrases it, "administrative-military-industrial-scientific complexes," in which the alliances are "sometimes mutually exclusive, and sometimes highly interlocked."

Graham Allison's (1972; 1999) *Bureaucratic/Governmental Politics Model* of decision-making has been instrumental in further reinvigorating the debate on DSM. The Model sees governmental decision-making as a political exercise in which the actors involved in policy making act not in terms of a consistent set of strategic objectives but rather according to various conceptions of national, organisational, and personal goals, and that these actors try to achieve their agenda through political means (Allison & Zelikow, 1999). These actors can be motivated by narrow self-interests when pursuing certain policy objectives, and their parochial perceptions can lead them to develop a unique perspective on national interests that may be contradictory or at odds with those held by other actors involved in the decision-making process (Allison & Halperin, 1972; Farrell, 1997).

Arms race or arms dynamic studies that have taken influence from Allison's Model identify wide ranging institutional actors and their parochial interests as the units of analysis. The overriding focus has, however, remained on the political elites (Presidents, Prime Ministers, or even dictators), the military, and the weapons R&D establishments. Other institutional actors like state legislatures, intelligence units, civil bureaucracies, think-tanks, etc, have also been studied in some cases (Beyer et al., 1986; McLean, 1986; Miall, 1987). The ruling political elites see weapons acquisitions as a means to attain glory, prestige, domestic political tranquillity, or the enrichment of domestic industrial allies (Gray, 1971, p. 41). For the political authority arms acquisitions can further hold electoral, economic, ideological, racial, national prestige, individual prestige, party prestige, and domestic political survival incentives (Buzan & Herring, 1998, pp. 103–114; Kennedy, 1983; T. M. Khan, 2010).

Similarly, military planners are argued to have parochial interests of their own and are believed to be influenced by several internal factors, such as officers' desire to protect their

organisational autonomy and control over military operations (Sagan, 1994). According to Gray (1971, p. 76), the degree of autonomy of the armed services and even the traditional supremacy of one particular branch of them might direct the verdict on a particular issue. In the case of nuclear weapons states, the military organisations would prefer building more nuclear weapons to boost their prestige, pad up their organisational budget, and would value operational autonomy and delegative command and control over them with authority to use them, if necessary, without political constraints (Sagan, 2009, p. 451).

The weapons R&D establishment or laboratories are central to arms production. Scientists and engineers innovate and develop new weapons systems for their own narrow bureaucratic interests; like knowledge inquisitiveness, budget, and prestige (Gray, 1971). The nuclear technical bureaucracies or weapons laboratories are also able to find or create sponsors in the professional military whose own bureaucratic interests lead them to favour the new weapons system. The resultant coalition of scientists and the military are also able to build political support within the legislative and executive political structure on the perceptions about the cost and benefits of the new systems (Sagan, 1996). These new developments, however, may not hold any precise relevance to the contemporary arms race (Gray, 1971, p. 75).

For the most part the ARM and DSM have competed against each other for prominence in arms race studies and exclusivity for explaining arms dynamics. The neo-realist proponents of ARM have either paid little attention to the role of DSM in armament phenomena or have rejected it altogether. John Mearsheimer (2001, pp. 37–38), the leading proponent of offensive realism branch of neorealism, argues that while domestic factors occasionally dominate state's decision-making process, however, they hinder the performance of offensive realism. Neorealists thus distance themselves from domestic factors not because they are not relevant but because it helps simplify their explanations of 'reality.' In turn, some proponents of DSM view ARM as "non-existent, negligible, or a matter of facile propaganda" (Köhler, 1979, p. 121).

However, many latter scholars have identified the two models as complementary to each other rather than competing and mutually exclusive (Buzan & Herring, 1998, p. 82; Evangelista, 1986, pp. 21–22; Gray, 1971). The premise of the *complementary approach* is

that external security threats provide impetus for a state to acquire weapons but the scale and manner in which a state arms itself will be determined by domestic forces (Farrell, 1997, p. 3). The external security considerations provide incentive for states to create structures and institutions to meet their military requirements. These structures and institutions subsequently gain momentum of their own and develop parochial interest in promoting military technological change and continued arms build-up, which then feeds into the arms race or action-reaction relationship with adversarial states. Once aroused to an external danger, actors such as irresponsible politicians, soldiers, industrialists, and even journalists can tap the national "preparedness syndrome" by propagating military technological or security gaps to promote weapons acquisition (Gray, 1971, p. 75).

While the complementary approach has sought to augment the explanatory limitations and gaps in both ARM and DSM by complementing them with each other, few studies have made attempts at identifying variables or factors for these modes, whether mutually exclusive or in complementarity, that would better help explain arms dynamic. However, even these variables in the literature are mostly generalisations and not universally accepted. Nevertheless, one important work in this regard is by Buzan and Herring (1998, pp. 92–97). For ARM the two authors have posited following variables.

1. *Magnitude*, i.e., what proportion the reaction bears to the triggering action?
2. *Timing*, i.e., speed and sequence of interaction
3. *Awareness*, i.e., the extent to which the parties involved in the process are conscious of their impact on each other, and whether they govern their own behaviour in the light of that consciousness

For DSM, Buzan and Herring (1998, pp. 103–114) summarise wide ranging factors. These include:

1) *Institutionalisation of Military R&D:* Military R&D establishments seek to continuously make technological advancements and in doing so render their own products obsolete. The continual qualitative improvement in technology means that the states will tend to [regularly] upgrade their military technologies.

2) *Institutionalisation of Military Production:* Armament industry seeks to maintain production capacity and seek volume of orders for one's own armed forces as well as export customers. Their desire to maintain capacity results in the creation of an internalised push for arms production to meet the needs of the industry.

3) *Economic Management*: Domestic political interests can lead governments to use increased military spending to stimulate demand within the economy.

4) *Electoral Politics*: Military procurement decisions are argued to make a big impact on patterns of employment and income in specific electoral constituencies and thereby could get entangled in the political process by which individual politicians and political parties seek to enhance their electoral appeal. This explanation in its essence underscores 'pork barrel' politics.

5) *Military-Industrial-Complex (MIC)*: Coalitions of particular military-industrial interests sometimes deliberately cooperate to promote their own interests, even at the expense of the national interest they are meant to serve.

6) *Organisational Politics*: Armed services organisations often develop fairly fixed views of their missions and the mainstream weapons systems that they prefer. These views are shaped as much by national historical experience, by the traditions of the individual services, and by the interests of organisational survival, as by considerations of what the opponent is doing.

7) *The Unifying and Identity-Creating Roles of Military Threats, Real and Unreal*: States are relatively fragile political structures. The task of governing them is made possible in some cases and easier in others by cultivating the unifying force of military threats. Such threats are sought and amplified by governments even where the objective basis for them is weak. In the absence of the threats, domestic divisions and dissatisfactions could rise, threatening the status of the ruling elite or making governmental process difficult. Such cases weapons acquisition, especially of strategic forces, are designed to emphasise national prestige.

8) *Civil War and Internal Repression*: Arms are acquired to have the means to fight civil wars or repress domestic populations.

Perhaps, the major problem for the two models arises from the fact that much of the generalisations for both have been developed from the cases of the two Cold War superpowers, which raises the question if they could sufficiently assist in explaining cases from states belonging to the so-called Third World or Global South. The field of International Relations (IR) has assigned only secondary importance to countries belonging to these supposed groupings. This is reflected in Amitav Acharya's (2014) writing that mainstream IR theories are too deeply rooted in, and beholden to, the history, intellectual traditions, and agency claims of the West; and view Third World or Global South as marginal to the "main story" of world politics. Dan Plesch (2016), draws similar conclusion that the Global South did not count in the conduct of world politics and that Southern countries were disposable assets that were only meant to serve the North's interests. However, IR schools of thought that have been critical of this 'marginalism' have also not proffered alternative theories.

As an interdisciplinary academic field, Strategic Studies flourished during the Cold War as it concerned itself with deterrence theory in response to co-development of nuclear weapons and long-range missiles by the superpowers. In its explanatory framework it drew influence from the rational choice modes of analysis based Western economic thinking and has since then been obsessed with the so-called 'Revolution in Military Affairs' (RMA) largely driven by U.S.-led applications of sensor, processing and communications technology to both weapons and tactics (Acharya & Buzan, 2010, p. 7). Despite emerging in the postcolonialism phase of world history and laying focus on ancient or classical Asian political and military strategists like Chanakya and Sun Tzu, Strategic Studies has also offered little alternative explanations and modes of analysis for the strategic dynamics, including arms acquisition, of the states belonging to Third World or Global South. On occasions when it has tended to address dynamics of these states it has narrowly viewed them through the prism of global power politics and explained their behaviour as congruent with neo-realist views.

The neo-realist school of thought tends to capture the dynamics driven from a specific state-type – Western or Northern in general and the U.S. in particular – and then assume that other states will either behave in the same ways or will come to do so as they develop and

progress to become facsimiles of those Western states, because, ultimately, that Western state ideal-type is universal. This is reflected in Kenneth Waltz's (1979, p. 118) views on Balance of Power (BoP) theory where he states, "… if some do relatively well, others will emulate them or fall by the wayside." Views along these lines have also been expressed in the Western political practitioners. For instance, Jimmy Carter (1977) in his inaugural presidential address stated, "And we know that the best way to enhance freedom in other lands is to demonstrate here that our democratic system is worthy of emulation.

The profound allusion from the above commentaries for arms dynamic studies is that the states at the leading edge of military technologies would set trends for RMA as well as define the theoretical and practical frameworks for the associated military strategies and tactics. In other words, those who innovate weapons technologies would be better equipped to define their utility and ultimate purpose. Others simply would have to follow in their footsteps and learn from their experience. Since modern weapons like tanks, submarines, combat aircraft, guided missiles, etc., are Northern/Western innovations Third World/Global South has little option but to emulate the originators. Of course, the question is, where would the others – who lack the industrial capacity for military R&D and military production – acquire advance military technologies from before they could emulate the originators' model?

States generally have two basic options for acquiring military capabilities: build-up own arms or ally themselves with technologically advanced global powers. Alternatively, states could pursue mutual peace with their respective adversaries to reduce armed threats (Glaser, 2000). During the Cold War some of the major Third World countries aligned themselves with the one of the two superpowers for their military and economic needs. Often, though not always, their alliance patterns were characterised with ideological preferences along the lines of two distinct governance and economic systems. Generally, those preferring Western democratic and capitalist model found themselves in the U.S. bloc, whereas those with communist or socialist dispositions in the Soviet bloc. Consequently, this led many of them to be viewed as subordinates and proxies of the superpowers, and the dyadic arms competitions that were dependent on weapons supply from the superpowers as *secondary arms races* (Buzan & Herring, 1998, pp. 117 & 128).

However, relationship between the various supposed geographic configurations has been far more complex than this narrow viewpoint. During the early periods of the Cold War, many of the newly independent countries, mostly configured into the Third World/Global South, wished to breakout of their colonial legacies, and not be styled as subordinates to their former colonisers or become client states to the superpowers in the emerging international system. In few cases these states sought to achieve their anticolonial and postcolonial agenda through creating common historical identities and conjoined political efforts, such as the Bandung Conference and the Non-Aligned Movement. Although the parlance Global South gained currency at the end of the Cold War as a substitute for the term Third World, which seemed to fall into disfavour, the concept, however, finds its origins in these and other twentieth-century anticolonialism movements (Grovogu, 2011).

The 1955 Bandung Conference not only upheld the principle of self-determination and called for end to racial segregation subjugation, domination, and exploitation of people and Third World states, it also demanded disarmament and prohibition of the production, experimentation, and use of nuclear weapons from the nuclear weapon states, some of which had or continued to have legacies of imperialism (Final Communiqué of the Asian-African Conference of Bandung, 1955). The Conference paved for the inception of the NAM in 1961. The NAM, in its essence, proffered a Third World/Global South model as an alternative to those of the superpowers', and one with its own independent and distinctive path to political, social, and economic development.

The global armament dynamic also laid at the heart of the NAM's political objectives. The NAM countries were critical of the superpowers' propensity to use coercion or use of force to impose their will. Apprehensions existed on their use of Third World/Global South countries as client states for their proxy wars through their massive arms transfers to them for creating arms acquisition dynamic, which was characterised with dependency and imposition of politico-military subordination to superpowers' priorities. Keen to escape subordinate position, the NAM countries sought to transform the international system in ways that would permit breaking out of the supposedly unbreakable 'security dilemma' arising from the ARM as well as avoid the perils of the MIC and the other components of the DSM.

Assumptions about the 'natural' or 'inevitable' ARM and DSM accounts were seen as rooted in a particular historical experience, which the leading postcolonial states attempted to challenge. As a result, the NAM countries began active advocation for nuclear disarmament, nuclear test-ban, and Nuclear Weapons Free Zones (NWFZ) as political tools for reining in the destructive and relentless superpower arms race and for ensuring their own security from these weapons. Ultimately, the NAM was unsuccessful in most of its transformative ambitions. Nevertheless, it revealed how the postcolonial states have sought ways of trying to break out of the idea of the universality claimed for the Western or superpower models, including of arms dynamics.

The genuineness of the NAM, Third World, or Global South's interest in curtailing arms race and promoting disarmament is generally deemed unquestionable. However, some in these political configurations have misused the rhetoric to justify their own development and acquisition of various weapons when promise to disarm was not complied with by the nuclear weapon states. As Plesch (2016) phrases it, a façade of good intentions concealed the policies to accumulate more hard power. Paradoxical relationship was thus observed between many of the Third World/Global South countries' criticism of the superpowers and their own intentions.

Aspiration for creating own regional influence and international status as well as domestic political interests led certain Third World/Global South countries to begin sustained efforts for developing indigenous military capabilities, including nuclear weapons and long-range ballistic missiles, while still supporting demands for disarmament at the United Nations. Implicit in their intention was also the desire to defy the superpowers' non-proliferation agenda that they perceived as discriminatory, to ensure independence from the superpowers in their national and foreign affairs, to create independent supply chain of weapons not susceptible to embargos, and to prevent superpower intervention in their hostilities.

In their efforts to indigenously develop conventional military and/or nuclear weapons capabilities, several of the Global South countries overtime, especially after the Cold War, have emerged into what Buzan (1987, pp. 47–48), identifies as *part-producers*. These states have a significant enough arms production capability to distinguish them from *non-producers*, but they do not match the scope and/or the quality of the *full-producers*. The dominant

arguments across arms race literature continues to view the armament dynamics of these part-producers through the prism of neo-realism, arguing that are almost exclusively explainable by the theorems of the ARM.

The relevance of the DSM, either mutually exclusive or in complementarity with the ARM, is usually downplayed or is unexplored in the case of part-producers, especially those from Global South. However, if the Western/Northern models of arms dynamics are to be taken as universal then should the introduction of factors such as *institutionalisation of military R&D* and *institutionalisation of military production* into the domestic structures of part-producer states not render them susceptible to other intrigues of DSM? According to Buzan and Herring (1998, p. 115), some degree of internal generation of arms dynamic probably remains valid for most countries, but the form it takes varies widely according to the type of political economy in the state concerned.

Given the limited but steadily developing military industrial base with minimal participation of commercial entities, a classical MIC model should not be expected in the case of part-producers. However, there may be a strong case for the administrative-military-industrial-scientific complex that operates on state level. Since the situation of the postcolonial Third World/Global South states is radically different, theorising and modelling of their arms acquisition dynamics may well derive from very different priorities and influences. In a general sense, factors such as *electoral politics*, *organisational politics,* and *the unifying and identity-creating roles of military threats* could be found to be common to almost all the countries, but their particularities in the case of Global South are expected to be sufficiently distinctive from those of the North. What the two models may completely differ on is the factor of *civil War and internal repression*.

In the case of South Asian strategic weapons – nuclear and missile – programmes few attempts have been made to understand the functions of ARM and DSM, but these are not without their limitations and often dispel one model for the other. In some cases, literature that emerged in the aftermath of overt nuclearization of the region began identifying and giving considerable weightage to domestic factors in incentivizing India's decision weaponise its nuclear and missile programmes. However, in the case of Pakistan, which too had made

significant investments and expansions in institutionalisation of nuclear and missile R&D and production to counterpoise itself against India, the validity of DSM is largely downplayed.

The common opinion in the literature is that the Pakistani strategic weapons programmes have been almost exclusively caused by India-centric security compulsions. Vipin Narang's (2009b, p. 278), analysis into Pakistani and Indian ballistic missile flight-test patterns to determine which amongst the possible security, domestic politics, and normative or prestige variables influence the two countries strategic weapons behaviour leads him to conclude that Pakistan is motivated primarily by security concerns, forced to keep pace with India's strategic weapons advances since it is the much weaker of the two powers. In contrast, Scott D. Sagan (2009), has attempted to review South Asian nuclear doctrines considering realist, organisational, strategic culture, and global strategic culture theories. On organisational theory, Sagan (2009, p. 509), however, limits his unit of analysis to Pakistani military and narrowly concludes that the military clearly makes the key decisions on nuclear weapons plans and doctrine on its own, with minimal influence at best from civilians in the government.

By and large, however, Pakistan's strategic weapons acquisition are presented as wholly dyadic in nature and the patterns by which Pakistan arms itself against India is taken as an *action-reaction* process. In contrast to these viewpoints, a key argument of this thesis is that the overarching emphasis on the exclusivity of the India-centric causation in the Pakistani case has underemphasised the military-technological and political triggers and enablers external to the Pakistan-India dyad that have been crucial in putting Pakistan on the path to acquire strategic weapons and has considerably demoted, if not completely neglected, the focus on domestic aspects of the strategic weapons programmes.

Furthermore, recent literature, such as by Naeem Salik (2009) and Feroz Khan (2012), provide compelling evidence to support the idea that in addition to the relevance of ARM, factors from DSM, particularly inter-bureaucratic and institutional rivalries, hold considerable credence in Pakistan's strategic weapons programmes. While recent literature indeed reinforces that the military is the dominant partner in the strategic weapons decision-making they underscore that crucial decisions in the strategic weapons programmes, such as the decision to acquire ballistic missiles, have not been made in isolation by the military but in

collaboration with civilian and scientific leadership, and that the latter two had willingly extended their support for the ballistic missile acquisition not merely because of the external security compulsions but also because of the parochial interests arising from the domestic structure or process.

These arguments present the dynamics of Pakistan's ballistic missile acquisition as a compelling case for the application of complementary approach. Further exploration in the matter may reveal congruency between some of the basic generalisations of ARM and DSM drawn from the superpower case, particularly from the U.S., and the empirical evidence from the Pakistani case, but caution must be exercised on most other particularities. A peculiar complexity in Pakistan's case arises from the fact that progression in its strategic weapons programmes and the intricacies arising from the DSM have taken place in between alternating democratic and military rules. Research focused on the superpowers, especially the U.S., was able to assume a level of stability in the basic political structures, institutions, and other domestic processes. ARM's assumptions about rational utility maximisation and DSM's assumptions about the inter-bureaucratic competition could, in the case of the U.S., take for granted the absence of major upheavals in the constitutional and institutional landscape, and consequent roles of the military, legislature, and other key nodes of DSM competition, which clearly is not the case with Pakistan.

1.1. Analytical Framework

For the application of the complementary approach to Pakistan's strategic weapons programme, exclusive focus is assigned to the dynamic of Pakistan's ballistic missile acquisition, in particular the dual-track systems comprising solid-fuel and liquid-fuel components. The choice of Pakistan's ballistic missile programme as the candidate for this research is centred on the fact that it is the most ostensible component of Pakistan's nuclear weapons programme, and that in the absence of transparency on its warhead and fissile material production much of the inferences on how Pakistan intends to deploy and employ/use its nuclear forces are drawn from the developments within its missile programme. A brief case overview is provided in *Chapter 2: Research Methodology* (see 2.2. Case Study Overview).

A major limitation the research faces in applying the complementary approach to the case of Pakistan's ballistic missile acquisition arises from the fact there is no unified and universally accepted theory establishing complementarity between ARM and DSM. Studies that have sought to undertake complementary approach have thus taken a bifurcated path for examining arms dynamic, leading them to separately analyse ARM and DSM aspects from or within case studies. Given this limitation, the analytical framework for this research involves bifurcated *causal-process tracing* focusing on external-strategic and domestic-institutional dynamics of Pakistan's ballistic missile programme.

In accordance with the bifurcated or two-fold analytical approach, two distinct sets of research questions have been created in *Chapter 2: Research Methodology.* The first set of question is concerned with the strategic-external dynamic and seeks to determine if the developments within the programme fully comply with the 'security rationale' and 'military requirements.' Through this the research seeks to evaluate if the inferences drawn from these aspects are congruent with ARM. The second set of question is concerned with institutional actors whose decisions paved way for ballistic missile acquisition, factors that shaped their preferences, and their level of influence on decision-making vis-à-vis each other. Through investigations into these queries the research seeks to evaluate if the inferences drawn from them are congruent with DSM.

To seek answers to the research questions, the thesis utilises secondary source data and primary source data, including first-hand interviews (see Data Triangulation in *Chapter 2*: Research Methodology). It is likely that the availability of large data on the external-strategic rationale for Pakistan's ballistic missile programme may naturally shift weightage to inferences favouring generalisations from ARM. Scholars like Buzan (1987, p. 94), however, provide leverage on such an occurrences, arguing that the question of interest for academic investigations is not whether one model is better than the other in some general sense, but what proportion of the observed behaviour each model explains for any given case. The research, however, strives to strike best balance between the two models and further takes caution not to reject one model in favour of the other, which would compromise the analytical framework.

CHAPTER 2: METHODOLOGY

As established earlier, the common opinion in the literature is that Pakistan's strategic weapons programmes – nuclear weapons and delivery vehicles like ballistic missiles – are almost exclusively caused by India-centric security compulsions (Dalton & Tandler, 2012; Dittmer, 2001; Narang, 2009b; N. A. Salik, 2009). Much of the explanations for Pakistan's strategic weapons acquisition are thus presented as wholly dyadic and the patterns by which Pakistan arms itself against India is taken as an *action-reaction* process. These views, however, present a narrow analytical picture. The overarching emphasis on the external India-centric causation in the Pakistani case has considerably demoted, if not completely neglected, the focus on domestic aspects of strategic weapons acquisition in the country.

In accordance with the *external-internal approach* to studying arms acquisition, this research aims to broaden the explanatory framework on the twofold external-strategic and internal-domestic causes and consequences of Pakistan's ballistic missile acquisition. For the explanatory purpose, the research strives to carry out qualitative case study analysis into the *causal mechanism* involved in the acquisition of solid-fuel *Ghaznavi* and *Shaheen* series and liquid-fuel *Ghauri* ballistic missiles. The combination of solid and liquid-fuel ballistic missile systems collectively forms what is known as the 'dual-track approach' to ballistic missile acquisition in Pakistan. The objectives of the analysis into the case studies are as follow:

First, to conduct a general historical overview of Pakistan's ballistic missile programme. This involves sketching a comprehensive chronological survey of origins, challenges, and developments in Pakistan's missile programme. While this covers the overall missile programme the broader emphasis, however, is on the ballistic missiles from the case studies.

Second, to explain the *external-strategic dynamic* of Pakistan's ballistic missile acquisition. The units of analysis here are Pakistan as a unitary rational actor and the external factors that provided the rationale for ballistic missile acquisition. This will help lay down the groundwork for explaining whether India-centric dyadic security compulsion is the exclusive 'causal phenomenon' of Pakistan ballistic missile acquisition and if indeed Pakistan's action-reaction behaviour is congruent with the classical mechanistic action-reaction process.

Third, to explain how the *internal-domestic dynamic* of the state has influenced and shaped the developments of the missile systems from the case studies. The units of analysis here are the key 'institutional actors' involved in the strategic weapons decision-making. These include the civilian governments – Prime Minister, Defence Cabinet Committee (DCC), and the parliament – the military, and the nuclear technical bureaucracies between the period of 1988-1999. The period represents a fragile democratic decade marred by civil-military tensions and rivalries between then weapons laboratories on strategic weapons programmes. This is followed by discussion on Pakistan's formal command and control (C^2) system that came into existence in 1999-2000 and strategic weapons decision-making was centralised under it.

Fourth, as part of conclusion, to explain the consequences of the strategic and institutional issues involved in the developments of the concerned missile systems to determine if the dual-track ballistic missile systems have sufficiently addressed the external-strategic requirements and have brought stability to India-Pakistan rivalry or are suboptimal developments arising from domestic institutional interests and have destabilised the India-Pakistan rivalry.

2.1. Process Tracing

For the analysis of the *causal mechanism* involved in the dual-track ballistic missile acquisition, the research utilises process tracing, a method by which this research attempts to identify the intervening causal process – the causal chain and causal mechanism – between an independent variable (or variables) and the outcome of the dependent variable (George & Bennett, 2005, p. 206). David Collier (2011, p. 823) defines process tracing as a "fundamental tool of qualitative analysis" and as "the systematic examination of diagnostic evidence selected and analysed in light of research questions and hypotheses posed by the investigator."

The research hypothesises, *while the overall rationale for Pakistan's ballistic missile programme has been external-strategic security compulsion the developments within the programme, especially during the formative period, have been influenced by domestic institutional politics*. In accordance with the research's twofold approach the research

questions are divided into two sets addressing strategic (external dynamic) and institutional (domestic structure dynamic). These questions are as follow:

Strategic

i. What are the external-strategic causes of the dual-track missile systems?

ii. What strategic objectives are the concerned missile systems intended for?

iii. Do the concerned missile systems optimally address the military's strategic requirements?

Institutional

i. Who are the key institutional actors involved in the decision-making on strategic weapons in Pakistan?

ii. What factors have shaped the perceptions, preferences, and actions of each actor?

iii. What was the level of individual influence as well as bargaining power of each institutional actor?

According to George and Bennett (2005, p. 207), process-tracing is an indispensable tool for theory testing and theory development not only because it generates numerous observations within a case, but because these observations must be linked in particular ways to constitute an explanation of the case (George & Bennett, 2005, p. 207). To process trace the acquisition of the dual-track ballistic missile systems and seek out the answers to the research questions the research employs an explanatory approach of 'generalised specific explanations,' a type of 'specific explanation' that uses theory as a basis for understanding and explaining the phenomenon in question or the case. Specific explanation links the observations made in a case in a causal mechanism or path comprising of *causal phenomenon* (CP), *caused phenomenon* (OP), *intervening phenomena* (IP), and *antecedent phenomena* (AP) (Van Evera, 1997, p. 16).

Given the research's hypothesis, sets of specific external-strategic factors are identified as the CP or independent variables in Pakistan's decision to embark on a ballistic

missile programme. The resultant missiles from the case study – i.e., the solid-fuel Ghaznavi and Shaheen series and the liquid-fuel Ghauri – are identified as the OP or dependent variables. Pre-existing external security dynamics and domestic institutional politicking are identified as the AP. The influence incurred by sets of both the external-strategic issues and domestic-institutional actors in shaping the ballistic missile programme is identified as the IP. In accordance with this explanatory approach to tracing causal mechanism the subsequent chapters of the research are organised in the following order:

Chapter-3 provides a comprehensive historical overview of the OP, i.e., Pakistan's ballistic missile programme. This chapter is a chronological narrative of the origins of the programme and the developments that have taken place at the time of writing up of this thesis. Much of the focus is, however, allotted to the origins and outcomes in the dual-track approach.

Chapter-4 deliberates on both the external-strategic and domestic-institutional AP. Although Pakistan's ballistic missile programme has had a causal life of its own, which would be demonstrated in the thesis, it is broadly an integral component of the country's nuclear programme, which further finds its antecedent in Pakistan's security dynamics. The chapter thus explains Pakistan's external security dynamic and its nuclear dimension, and the domestic institutional politicking resulting from Pakistan's institutionalising of the nuclear programme.

Chapter-5 identifies and explains the set of external-strategic CP that have caused the acquisition of dual-track ballistic missiles in Pakistan. A particular focus is laid on India as the causal rationale, the U.S. as the causal trigger, and China and North Korea as the causal enablers of Pakistan's dual-track ballistic missile programme.

Chapter-6 deliberates on external-strategic IP. The chapter focuses on how factors such as Pakistan's military conflicts and crises with India, cooperative peace efforts with India in the form of confidence-building measures on ballistic missiles, and technological innovations in the Indian missile programme that have intervened on regular basis in the progress of Pakistani ballistic missile programme and influenced the developments within it.

Chapter 7 deliberates on the domestic-institutional IP. The chapter focuses on how the concerned decision-making institutions and their political and institutional interests have intervened in Pakistan's ballistic missile programme to influence and shape the developments within it. The particular focus is on decision-makers such as the Prime Minister, the Military, the Nuclear R&D establishments, the formal C^2 system, and other interest groups such as the legislature and cabinet committees.

Since the process tracing as well as the generalised specific explanation lay emphasis on employing theories for explaining the case this research will conduct a congruency analysis or theory testing between relevant theories and empirical data narrativised in the above chapters to determine whether the patterns in Pakistan's dual-track ballistic missile acquisition are congruent with theoretical explanatory frameworks posited by scholars on armament phenomena. The conclusions of *Chapter 5* and *Chapter 6*, which deal with the external-strategic dynamic, are concerned with explaining if the Pakistani behaviour is congruent with the mechanistic *action-reaction* process.

Similarly, in its conclusion, *Chapter 7* is concerned with explaining if the role and interests of the concerned decision-making institutions are congruent with the theories on the DSM. The conclusions further deliberate on the consequences of dual-track ballistic missile acquisitions, i.e., whether the concerned missile developments have been optimal with Pakistan's operational requirements and have stabilised the Pakistan-India dyadic rivalry or have been distorted by internal- domestic considerations and have destabilised the Pakistan-India dyadic rivalry.

2.2. Case Study Overview

The timeframe for the case study analysis is from 1987 when Pakistan initiated its ballistic missile programme to 2004 when Pakistan introduced the medium-range Shaheen-II ballistic missile with an ability to target much of India and in the process solid-fuel missile development took precedence over the liquid-fuel. On the external level, Pakistan's security dynamics began changing profoundly in between this period. By late 1980s both India and Pakistan had crossed the necessary technical thresholds for developing nuclear weapons and India had subsequently initiated an ambitious ballistic missile programme. Even though

Pakistan reacted by developing Hatf-I and Hatf-II short-range ballistic missiles these systems were subpar and the overall interest in the programme appeared somewhat timid.

A major push for developing more sophisticated ballistic missiles came when the U.S. withdrew military assistance and invoked military sanctions against Pakistan at the end of the Soviet-Afghan War. This resulted in the U.S. withholding 28 additional F-16 fighter aircraft that Pakistan had already paid for. The aircraft served as a means to both the conventional and nuclear deterrence against India and without additional aircraft and logistical support Pakistan was facing a widening military imbalance in the region that desperately needed to be addressed. To offset its inability to acquire F-16s or similar platforms Pakistan acquired solid-fuel and liquid-fuel ballistic missile technologies from China and North Korea respectively, which helped lay the foundations for the development of the missiles from the case studies.

The internal situation relating to the state and decision-making on strategic weapons programmes in Pakistan during the period was characterised by back-and-forth political transitions between military rule and democracy. In the case of the U.S. (and arguably the Soviet Union), which provides the paradigm for arms dynamics analysis, the basic questions of the form of government are taken for granted and are unconsidered. Whereas questions pertaining to the impact of regime type and civil-military relations on arms acquisitions are very much alive in the Pakistani case. While some studies have identified Pakistan's military as the decisive arbiter in strategic weapons decision-making, other important players like the political leadership, nuclear-technical bureaucracies, civil bureaucracies, and intelligence units and their role and interest in pursuing missile development remain understudied. This research is intended to examine how the transitioning political systems and institutional interests have impacted the process of strategic weapons acquisition in Pakistan.

Recent literature presents a strong case for the analysis of institutional issues in Pakistan's decision to pursue a dual-track approach to ballistic missile acquisition. Works by Pakistani analysts like Naeem Salik (2009) and Feroz Khan (2012) suggest that the assessment made by the military in the 1990s favoured solid-fuel ballistic missiles based on the Chinese M-11 and M-9 missiles and it subsequently tasked relevant technical bureaucracies to establish R&D structures for developing indigenous variants of the missile systems, resulting

in the development of Ghaznavi and Shaheen series ballistic missiles respectively. Yet, the plan for liquid-fuel Ghauri ballistic missile based on the North Korean No-dong ballistic missile was midway introduced into the equation. Pakistan was soon to find the North Korean missile technologically inferior to the point where its application in strategic role faced frustrating limitations and the bilateral cooperation also became politically controversial. The question of why Pakistan had chosen to invest in a problematic North Korean technology cannot sufficiently be answered through external security rationale. Available evidence suggests that domestic interests instead played a crucial role in liquid-fuel Ghauri's induction.

2.3. Data Collection

Research methods for data collection for this thesis involve a mixed-method approach called 'data triangulation' that involves the collection and analysis of data from two or more sources to increase the validity of a study (Denzin, 2012; Mathison, 1988). The data acquired for the triangulation approach in this thesis is threefold; (1) theoretical works on arms acquisition for the explanatory purpose, (2) published secondary source data on Pakistan's strategic weapons programmes, and (3) primary source data, including first-hand interviews with relevant experts and policymakers on the concerned subject to expand the available knowledge base.

This research is non-technical and non-sensitive. Nevertheless, some technical data is incorporated into the thesis from the opensource for explanatory purposes. The vast data collected for the research is, however, historical in nature and is geared towards broadening the explanations on information and knowledgebase on Pakistan's missile programme that is already available in the *opensource*.

Realising the sensitivity of the subject and confidentiality surrounding it, a deliberate and cautious decision was made to interview governmental and military officials who have retired from their services and are known to have contributed or corroborated in the *opensource* knowledgebase on Pakistan's nuclear and missile programmes. In fact, this research's hypothesis and some of its core arguments are drawn from the contributions made to the opensource knowledgebase by these officials.

Important interviews sources included former Director General Strategic Plans Division (SPD) General (R) Khalid Kidwai, former Directors Arms Control and Disarmament Directorate of the SPD Brigadier (R) Feroz Khan and Brigadier (R) Naeem Ahmad Salik, former Foreign Secretary of Pakistan Najmuddin Shaikh, senior Pakistan's People's Party politician Syed Naveed Qamar, Pakistani defence analyst Dr Aeysha Siddiqa. Others, who have requested anonymity, however, cannot be named here.

CHAPTER 3: CAUSED PHENOMENA – AN OVERVIEW OF PAKISTAN'S BALLISTIC MISSILE PROGRAMME

For states possessing nuclear weapons, ballistic missiles are the most effective means of delivering nuclear warheads against an adversary. It is thus logical that a country pursuing or possessing nuclear weapons would give significant importance and priority to developing ballistic missiles. Yet in Pakistan's case, the programme failed to gain importance over other aspects of its nuclear weapons programme for a considerable time. While there are suggestions that in 1974 Pakistani leadership took decision to pursue a missile programme simultaneously with the nuclear weapons programme, however, it took Pakistan well over a decade to prioritise setting up infrastructure and expertise necessary to support an advanced missile programme. Nevertheless, Pakistan had some rudimentary knowledge and experience in rocketry owing to sounding rocket technologies it acquired for upper atmospheric research. The origins of Pakistan's missile development are thus found in its civilian space research programme.

3.1. Origins of Rocketry in Pakistan

In the late 1950s, the U.S. began offering cooperation in space research to its Third World allies. To this effect, it signed Memorandums of Understanding (MoU) for cooperation in space activities and technology transfer with countries like Argentina, Brazil, India, South Korea, Mexico, Pakistan, and Taiwan (Scheffran & Karp, 1992, p. 239). Under the provisions of the MoUs, the U.S. would provide these countries with wide-ranging space research technologies, including suborbital sounding rockets, which have been viewed as the equivalent of short-range ballistic missile or SRBM (Karp, 1990, p. 8; Scheffran & Karp, 1992, p. 239).

To take advantage of the U.S. cooperation programme Pakistan established the Space and Upper Atmosphere Research Commission (SUPARCO) in 1961 as a separate wing in the Pakistan Atomic Energy Commission (PAEC). The new agency was instituted and spearheaded by future Nobel laureate Dr Abdus Salam and Air Commodore Władysław Turowicz, a Polish military aviator and aeronautical engineer who had migrated to Pakistan in 1948. Turowicz is

credited with introducing rocket science in Pakistan, which would eventually prove instrumental for missile development in the future (Laskowska & Hali, 2016). His direct contributions to Pakistan's missile programme, however, remain uncertain and he died nine years before Pakistan's first missile test.

Soon after SUPARCO's inception Pakistan sent its scientists and engineers for training to NASA. Within one year of its inception, SUPARCO had begun launching sounding rockets in collaboration with NASA to gather meteorological data. The first launches were of Rehbar-1 and Rehbar-2 sounding rockets on June 7th and 11th of 1962, respectively. These rockets were rebranded Nike-Cajun two-stage sounding rockets acquired from NASA (Corliss, 1971, pp. 90–91; *Suparco History*, n.d.). The solid-fuel Nike served as the first-stage of the sounding rocket and was an adaptation of the boosters of Nike antiaircraft missile developed for the U.S. Army (*Origins of NASA Names - Sounding Rockets*, n.d.). In July 1963, NASA and SUPARCO entered into another MoU for ensuring continued cooperation in developing sounding rockets (*"Report of the Secretary of the Senate: From July 1, 1964 to December 31, 1964 (Volume 21),"* 1965, p. 370). In 1964, NASA made further contributions to Pakistan's sounding rocket programme by selling SUPARCO Judi-Dart and Nike-Apache sounding rockets that were to be assembled in Pakistan and launched from its Sonmiani range (*Astronautics and Aeronautics, 1964: Chronology on Science, Technology, And Policy*, 1965, pp. 107, 399).

In 1964, SUPARCO became a separate organisation and by the end of the decade had begun rocket indigenisation efforts by establishing sounding rocket manufacturing plants to reduce dependency on foreign suppliers (Mistry, 2003, p. 118). The timing of SUPARCO's decision to indigenise rocket production coincides with the changing nature of the U.S. export policy on space technologies, which had started to become less liberal by late 1960s. U.S. President Richard Nixon's decision to issue a license for production of McDonnell Douglas Thor-Delta Space Launch Vehicle (SLV) to Japan in 1969 had created a rift between the Nixon Administration and the U.S. Congress. To mollify the Congress President Nixon issued National Security Decision Memorandum-187 (NSDM-187) on 30th August 1972.

Though NSDM-187 established a process for reviewing export requests for space launch technology on a case-by-case basis, it largely brought the U.S. cooperation in foreign rocket programmes to an end, especially for Third World states (Bowen, 2000, p. 39; Scheffran

& Karp, 1992, pp. 239–240). Resource and cash-strapped SUPARCO was largely dependent on the loan of sophisticated rocketry items like ground instrumentations, radar equipment, and launchers from NASA to support its sounding rocket programme throughout the early to mid-1960s (*"Report of the Secretary of the Senate: From July 1, 1964 to December 31, 1964 (Volume 21),"* 1965, pp. 369–371). The issuance of NSDM-187 may have rendered it difficult for NASA to continue to extend such loans to SUPARCO.

However, even before NSDM-187 Pakistan had already begun shifting focus to suppliers like France and the U.K. for providing training, fuel, and other rocket technologies, and by late 1960s to early 1970s SUPARCO was predominantly producing and testing British and French sounding rockets (Moltz, 2012, p. 174; *Sonmiani*, n.d.). In January 1965, British National Committee on Space Research (BNCSR) entered a trilateral MOU with NASA and SUPARCO, whereby it agreed to provide SUPARCO with technical assistance, training, and payload compatible with the Nike-Cajun and Nike-Apache sounding rockets. It further agreed to loan special ground equipment needed to support the agreed-upon technical assistance (*"Report of the Secretary of the Senate: From July 1, 1964 to December 31, 1964 (Volume 21),"* 1965, p. 370). However, the principal support to Pakistan's sounding rocket programme was provided by France. Sud Aviation, a French private aerospace firm, in particularly emerged as major contributor to Pakistan's sounding rocket programme when it sold the manufacturing rights for Centaure and Dragon sounding rockets to the country. France further facilitated Pakistan with a license to manufacture Stromboli rocket engines. (Binkley, 1994, p. 78; *"From Belier to Eridan,"* n.d.; Steinberg, 1983, p. 46).

To support local manufacturing of sounding rockets Pakistan established rocketry infrastructure comprising of a rocket manufacturing plant, rocket test facilities, chemical and propellant laboratories, high-speed tracking radar, and a laboratory to work on telemetry (Mehmud, 1989). However, the infrastructure appears to have been very basic, which was not expected to produce anything sophisticated. There are also no indications that Pakistan's drive for indigenisation of rocket production had any hidden agenda of exploiting the knowledge, experience, and technologies gained through foreign cooperation for eventually developing missile capabilities. In fact, by the time rocket production and related facilities had been fully established Pakistan's interest in rocketry had considerably subsided with the last

of the sounding rocket experiments appear to have taken place on 18th April 1973 (*Sonmiani*, n.d.).

Several factors are attributed to the decline of rocketry in Pakistan during the period, including NSDM-187, rising cost of the programme, and great advancements made in satellite technology for space and upper atmospheric research as an alternative and more viable mean (Karp, 1990; F. H. Khan, 2012, p. 236; Mehmud, 1989). Nevertheless, sounding rockets acquired from European states, training received from NASA, and establishment of local rocket manufacturing and supporting facilities are believed to have helped Pakistan master various rocketry related operational procedures and handling of solid-fuel (Karp, 1996, p. 59). These factors, amongst others, subsequently proved instrumental in laying foundations for early ballistic missile developments in Pakistan (Karp, 1990, p. 9; Moltz, 2012, p. 174).

3.2. Challenges In Ballistic Missile Programme

It is unclear as to when exactly Pakistan began its R&D into ballistic missiles, but the popular opinion is that the developmental efforts started in the late 1980s. The decade, however, posed severe challenges to potential Third World ballistic missile proliferators. Where soft technologies, such as organisation, management, technical or scientific staff were, at best, rudimentary, hard technologies like re-entry vehicles, guidance systems, rocket engines and launch platforms necessary for building ballistic missiles were non-existent (F. H. Khan et al., 2004). Pakistan only had its rudimentary sounding rocket production facilities to rely on. Funding was another issue, which had previously brought SUPARCO's sounding rocket programme to a grinding halt.

Besides domestic challenges Pakistan also faced hurdles on international levels. One of the major hurdles faced by Pakistan was the Missile Technology Control Regime (MTCR), which was established in 1987 by the members of the G-7 states. The principal objective of the MTCR had been to prevent the proliferation of complete rocket systems (including ballistic missiles, SLVs, and sounding rockets) and unmanned aerial vehicle (UAV) systems (including cruise missiles systems, target and reconnaissance drones) that are capable of delivering a payload exceeding 500kg and range exceeding 300km threshold; production facilities for such systems; and major sub-systems including rocket stages, re-entry vehicles,

rocket engines, guidance systems and warhead mechanisms (*MTCR Guidelines and the Equipment, Software and Technology Annex*, n.d.).

The causal phenomenon for the MTCR's creation was the fact that many Third World states during the 1980s were attempting to acquire ballistic missiles either through domestic production or through procurement from willing suppliers. Some of these states succeed in their efforts by exploiting both the state and non-state firms from industrialised Western European countries. In this regard, one of the worrisome developments for the major powers during the period was that of Argentina's Condor-II ballistic missile. Argentina began developing the missile in 1984 as an offshoot of its Condor sounding rocket programme, for which it had acquired multinational technical and financial support.

Over twenty companies from Western Europe, including from West Germany, France, Italy, Spain, Switzerland, and Austria, were involved in supplying technologies for the Condor project (Tollefson, 1994, p. 255). The technology provided for the project was also believed to be based on the U.S. Pershing II ballistic missile (K. G. Weiss, 2001). Even more worrisome was that Egypt and later Iraq had been partners in the programme. For its part, Egypt acted as the middleman and Iraq provided finances for much of the project (Tollefson, 1994, p. 255). Though Egypt later dropped out of the programme the missile would be inducted in Iraq as Badr-2000. The Condor-II proliferation network involving the three Third World states and Western commercial suppliers highlighted significant loopholes in the export control policies of major industrialised states.

Other conflict-prone states like Iran, Syria, Libya, Saudi Arabia, and Israel were also pursuing ballistic missile acquisition by similarly exploiting loopholes in Western export control laws or by acquiring complete systems from suppliers like the Soviet Union, China, and North Korea. In South Asia, India had initiated its Integrated Guided Missile Development Programme (IGMDP) in 1983. The programme envisaged development of an SRBM called Prithvi and a medium-range ballistic missile (MRBM) called Agni, for which India began exploiting conventional missile and space rocket technologies and knowhow it had acquired from the Soviet Union, the U.S., and Western European states. The two missiles were first flight-tested in February 1988 and May 1989, respectively (Mistry, 2003, pp. 114–115). The MTCR achieved limited success against ongoing Third World missile projects but did make it

difficult for late starters like Pakistan to seek technical assistance from both the state-operated and commercial firms belonging to major industrialised states.

However, even before the MTCR went into effect Pakistan began to find it difficult to acquire missile-related technologies and assistance from industrialised states. While Pakistan is largely believed to have mastered uranium enrichment for nuclear bomb-making in the mid-1980s by exploiting the commercial suppliers from Western Europe it found the similar path to developing long-range ballistic missiles blocked due to Western intelligence agencies acting as watchdogs over its proliferation activities and adamant U.S. diplomacy (Karp, 1996, p. 178). A 1981 report prepared by Massachusetts Institute of Technology (MIT) for the U.S. Arms Control and Disarmament Agency, identified Pakistan amongst the states that may have interest in acquiring long-range solid-fuel ballistic missile. The report categorised Pakistan amongst the states with a less advance technological base to produce such missile systems and therefore likely to seek external procurements and assistance, especially for guidance and propulsion systems. The report identified the commercial firms in the U.S. and Western European states as possible sources of missile-related technology that states like Pakistan may seek assistance from (Balaschak et al., 1981).

As a state likely to seek external assistance, U.S. intelligence began making assessments into possible non-state or commercial sources of missile technologies Pakistan might be, or was, exploiting. West German firms were of particular interest as they had been known for their cooperation with many of the Third World missile programmes. In some cases, the West German firms were able to export dual-use items that could be utilised in both civilian and military programmes to the Third World states with the prior knowledge and export approval of the West German government.

In the early 1980s, the U.S. intelligence reports suggested that Pakistan was in contact with the West German commercial rocket engineering firm Orbital Transport und Raketen Aktien Gesellschaft (OTRAG) for acquiring short-range military rockets (Miller, 1981). OTRAG had operated from Munich at first but later relocated to Zaire (now Congo) and then to Libya and was known for operating test facilities and developing small launch vehicles for some of the Third World countries. Although OTRAG insisted that its activities were non-military it was purported to have signed a contract with Syria to develop ballistic missiles with a range of

300km and 2000km and 500kg warhead (Karp, 1984). It was claimed that the Libyan leader Colonel Muammar Gadhafi himself had contacted Pakistan with an offer of OTRAG's technology (Rao, 1981, p. 507). However, the allegations of Pakistan's cooperation with OTRAG or transfer of any technology by OTRAG to Pakistan have remained unsubstantiated. Moreover, the firm was marketing liquid-fuel technology whereas early developments in Pakistan ballistic missile programme were exclusively based on solid-fuel propellant (Binkley, 1994, p. 80). OTRAG also ceased operations in 1987, around the same time Pakistan is believed to have begun its ballistic missile developmental efforts.

In the late 1980s, West German firm Neue Technologien GmbH (NTG) was reported to have sought, and in some cases obtained, technologies from the U.S. and other West German companies for nuclear and missile-related programmes in both Pakistan and India. A 1986 investigation implicated NTG for reexporting two U.S. manufactured high-power lasers to PAEC for the purpose of nuclear fuel fabrication. On 4th September 1987, NTG placed an order for laser technologies from the U.S. firm EG&G and a smaller amount of equipment from the West German subsidiary Spectra-Physics. These orders were believed to have been intended for guidance system of Pakistani missiles but were shelved as the company failed to get an export license and was set to face a legal battle against the U.S. and West German authorities (Hibbs, 1989). In 1989, Pakistan was alleged to have been in contact with Aviatest, one of the firms involved in Argentina's Condor-II project and is believed to have acquired missile testing equipment from the firm ("'Nuclear Developments,'" 1989). Similarly, Leybold AG, formerly Leybold-Heraeus GmbH, was implicated in illicit nuclear trade with Pakistan and was believed to have provided the country with sophisticated equipment and material that could be used in both nuclear and missile developments (Binkley, 1994, p. 79).

Perhaps the most controversial case of a commercial firm's involvement in Pakistan's missile-related activities was from the U.S. itself, though the case is mainly that of a corporate financial fraud than that of a missile technology cooperation. On 21st September 1987, British firm Ferranti International announced the merger with the U.S.-based defence contractor International Signals & Control (ISC). Ostensibly ISC was a lucrative company with several pending defence contracts. One such contract came to be known as the Khyberpass or KP Contract by which ISC's founder James Guerin claimed to have been awarded a large order worth hundreds of millions of U.S. dollars from a firm called Khyberpass Industries to supply

or build guided missiles and launch facilities for Pakistan (J. F. Wilson, 2013, p. 63). Guerin claimed that he had personally signed the contract with Pakistani dictator General Zia Ul-Haq (Rocco & Flannery, 1991).

After the merger with Ferranti International, it became apparent that ISC's operations and impressive balance sheet were largely fabricated through either illegal or fictitious contracts by Guerin (J. F. Wilson, 2013, p. 28). Ferranti International alleged that the KP Contract was one such fictitious contracts (Donkin, 1990; Lorenz, 1990). In 1987, General Talat Masood, the head of Pakistan Ordnance Factory (POF), had visited ISC plant in the U.S. and held meetings with the firm's executives. Though General Masood was not linked with the KP Contract, Guerin used his visit as a subterfuge to inflate the value of his company and convince Ferranti International that the missile contract was legitimate (J. F. Wilson, 2013, p. 120). Both Ferranti International's lawyers and the U.S. Internal Revenue Service (IRS), however, stated that Pakistan neither received any equipment, technology, or service from ISC nor did it pay any money as part of the deal (Binkley, 1994, p. 80).

The KP Contract may have been dubious and Pakistan may not have received any missile-related technology from the ISC, but the case and other similar deals were still of significance as they not only revealed a serious fraud by a well-known U.S. defence contractor but also the involvement of officials from the U.S. and the U.K. in compromising their respective export control laws, and nuclear and missile non-proliferation efforts. Investigations revealed that the government officials from the two countries had not only been in contact with Guerin but also that he had carried out his covert activities with their permission throughout the 1970s and 1980s. In the 1990s, governments of both countries refused to acknowledge their links with Guerin or his dealings with countries like South Africa, Iraq, China, and Pakistan (J. F. Wilson, 2013, p. 28).

3.3. Early Ballistic Missile Development: Hatf-I & Hatf-II

Given the industrial limitations, major powers tightening their grip on proliferation of rocket and missile technologies through the MTCR and export control policies, and the U.S. keeping a close eye on its proliferation activities Pakistan was left with limited options to begin its ballistic missile development with. However, with India's flight-test of Prithvi SRBM

in 1987 Pakistan hastened its development of ballistic missiles. Then Vice Chief of Pakistan Army, General Mirza Aslam Beg, tasked Combat Development (CD) Directorate – an organisation he had established in 1985 to study military modernisation – to analyse India's ballistic missile development and coordinate a response by working alongside SUPARCO. Given SUPARCO's inadequate funding at the time and rudimentary knowledge base, the organisation was further tasked to work alongside Kahuta Research Laboratories (KRL) to utilise various available technologies to develop ballistic missiles (F. H. Khan, 2012, pp. 236–237).

In his 29th April 1988 diary entry then U.S. President Ronald Reagan (1988) expressed his concerns that despite denials Pakistan "may be dickering for nuc.[sic] missiles" and that China had become arms market to the world, insinuating possible Chinese assistance to Pakistan. In May 1988, The New York Times report cited an unnamed Pakistani source with close ties to the government stating that Pakistan had carried out an unpublicised test-firing of a missile capable of carrying a nuclear weapon. A further reference to "two stages" to the missile was cited, which the news article clarified that the two stages could actually be two separate missile systems: one being 20 feet in length with a range of 50 miles ($\geq$ 80km) and the other being 32-feet in length with a range of 186 miles ($\leq$ 300km). The source of the report revealed that the missile had been developed with Chinese assistance (Trainor, 1988).

In a follow-up report, Washington Post foreign correspondent Richard W. Weintraub stated that a Pakistani source confirmed to him that the test of Shadoz (King Hawk) ballistic missile, which had a one-stage and two-stage versions, had taken place from Pakistan's Thar desert (Ottaway, 1988). Within the same news articles, however, officials from the U.S.' Defence and State Departments were cited as discounting any missile test by Pakistan, instead terming it as "propaganda to warn India that Pakistan could produce surface-to-surface missiles capable of carrying nuclear warheads." The Pakistani governmental spokesman also denied having any knowledge of the ballistic missile flight-test (Ottaway, 1988). It is difficult to ascertain if ballistic missile test launches ever took place in 1988. In any case, there is no ballistic missile designated as Shadoz in Pakistan's inventory.

In February 1989, Pakistan eventually did publicise for the first time that it had test-launched two SRBMs. The missiles' names were revealed to be Hatf-I and Hatf-II, and their

flight-test were termed as "successful." Interestingly, the specifications of the two missiles bore resemblance to the ones reported by The New York Times and the Washington Post, indicating that the leaks may have been deliberately provided by someone within the Pakistani government. Hatf-I reportedly had a range of 80km (some sources stating as 70km to 100km) with a payload of 500 kg and was 6 meters (20 feet) long (*Hatf-1*, n.d.). Whereas Hatf-II has a range of 300km with a similar payload and was approximately 9.75 meters (32 feet) long (*Hatf-2/Shadoz*, n.d.). Both missiles were based on single-stage solid-fuel propellant technology (N. A. Salik, 2002a). On 23rd March 1989, merely a month after their revelation, the two ballistic missiles were displayed at Pakistan Day parade, which was interpreted as the greatest event in the history of Pakistan (Z. I. Cheema, 2010, p. 196).

Western assessments on the two ballistic missiles largely viewed them as drawn from French sounding rocket technology (Moltz, 2012, p. 174). Feroz Khan (2004), concurs with the assessment and believes that the missile was developed by combining French Centaure sounding rockets and parts of Soviet Scuds. Over a dozen Scuds had been fired upon Pakistan's tribal area by pro-Soviet Afghan forces in 1988 in retaliation for Pakistan's support of Afghan mujahideen (Carus, 1991; F. H. Khan et al., 2004; N. A. Salik, 2002a). Other sources identify Hatf-I and Hatf-II as based on French Dauphine and Eridan sounding rockets, respectively (Mistry, 2003, p. 118; "Pakistan Derives Its First 'Hatf' Missiles from Foreign Space Rockets," 1995). According to Feroz Khan (2012, p. 237), French technological transfers to Pakistan may have included propellant ingredients, rocket components, and equipment for solid-fuel casting, curing, and solid-rocket testing facilities. However, these technologies may exclusively have been intended for the sounding rocket production.

Pakistan is not the only country to have converted sounding rockets into ballistic missiles. Argentina converted its Condor sounding rocket to Alacrán SRBM prior to taking a similar path for Condor-II's development. Alacrán never entered production, leading experts to believe that missile was experimental, possibly intended as a technology demonstrator for Condor-II. Similarities between early Argentinian and Pakistani ballistic missiles are not just limited to their origins in sounding rockets. Mistry and Gopalaswamy (2012) find striking resemblances between Alacrán/Condor-I and Hatf-1/Centaure in terms of dimensions, staging, and propellant. Though neither Alacrán nor the two Hatfs were considered to be sophisticated missiles, the conclusions drawn by the two authors suggest that such an

experiment did yield some advantages for the two countries. For instance, conversion of sounding rockets into a single-stage SRBM provided the two countries with easy-to-use missile systems without the need to test complicated stage-separation technology. Moreover, the smaller size of such systems provided them with advantages in mobility and tactical use, and the solid-fuel technology also provided them with ease of storage.

However, where Alacrán is believed to have had an inertial guidance system, Hatf-I and Hatf-II's guidance and accuracy related capabilities have been contested. While announcing their first flight-tests, General Beg characterised the two ballistic missiles as "extremely accurate systems." The US experts, however, dismissed the claim, stating that Hatf-I was "an inaccurate battlefield rocket that can fly 80km and Hatf-II is just two Hatf-Is put together and cannot fly 300km" ("Pakistan Derives Its First 'Hatf' Missiles from Foreign Space Rockets," 1995). Naeem Salik (2009, p. 208), corroborates the US' viewpoint, stating that two missiles were "unguided free-flight rockets." Pakistani physicist, Dr Hoodbhoy (2013b, p. 105), also states that the missiles had low accuracy as they lacked terminal guidance system.

The short-ranges and lack of guidance system rendered the two Pakistani SRBMs of limited utility in a strategic role, raising questions on their ability to carry nuclear warheads. Though some foreign experts and media outlets viewed the development as an extension of Pakistan's nuclear weapons programme official statements from Pakistan remained vague. Prime Minister Benazir Bhutto, however, told the Western press that missiles were part of a 'non-nuclear' weapons programme (Cockburn, 1989). Although, Ms Bhutto's statement reflected the reality of technological limitations of the two missiles its intent appears to have been mostly political, aimed at maintaining the ambiguity of Pakistan's nuclear weapons ambitions and for avoiding any undesirable international attention. After initial flight-tests, the development of the two missiles was halted for over a decade. Flight-test of the advanced Hatf-IA, with an extended range of 100km, took place in February 2000, but no further flight-tests have been reported since. Even if the missile is operational, it is unlikely to be nuclear capable. The original Hatf-II was also abandoned, and the designation was transferred to the new 200km SRBM dubbed Hatf-II Abdali, which was first flight-tested in May 2002 (F. H. Khan, 2012, p. 237; N. A. Salik, 2009, p. 208).

While Mistry and Gopalaswamy's comparison between Alacrán and Hatf-I does not insinuate any cooperation between Argentina and Pakistan, the CIA in the early 1990s, however, suspected that the Pakistani officials were in contact with the representatives of the European consortium that had supervised the development of Argentinian Condor-II and that Pakistan could have Condor-II or another ballistic missile with range exceeding that of Hatf-II by mid-to-late 1990s (*"Ballistic Missiles in India and Pakistan: An Intelligence Assessment,"* 1990). Apart from suspected link and purchase of missile testing equipment from Aviatest in 1989, much like before, this claim also remains unsubstantiated. Pakistan nonetheless did require significantly more advance and longer-range ballistic missiles, especially ones that could carry nuclear warheads. However, the MTCR continued to pose severe challenges and no missile flight-tests were reported from 1989 and 1997 (Mistry, 2003, pp. 121–122). This did not mean that Pakistan's quest for advance ballistic missiles was subverted. During the interval, Pakistan was actively involved in consolidating its technical base by seeking assistance and technologies from non-Western and non-MTCR states. In this regard, China and North Korea emerged as the principle and distinctive suppliers of missile technology and related assistance.

3.4. Dual-Track Approach

Acquisition of a solid-fuel missile technology was a logical step for Pakistan given its prior experience in handling this type of propellant. Solid-fuel propellants also offered technical and operational advantages. The propellant comprises of a mixture of solid compounds of fuel and oxidant, which are mixed as fine powders and then pressed into a solid 'cake' (*Solid and Liquid Fuel Rockets*, n.d.). The construction of rocket-engine that needs to accommodate solid-fuel is also the simplest, consisting of a steel casing that stores the fuel (*Rocket Propellants*, n.d.). The propellent requires minimum maintenance and the fuel is generally stable at ordinary temperatures, making it safer to handle (*Propellants*, n.d.; *Rockets and Missiles: Solid Fuel Rockets*, n.d.). More importantly, solid-fuel missiles can be stored and transported while pre-fuelled and thereby launched very quickly, leaving them less vulnerable during launch preparations (Carisch & Rickard-Martin, 2014).

In contrast, liquid-fuel propulsion requires complex engine systems. Most liquid-fuel rockets use two separate propellants: a fuel and an oxidiser (*Propellants*, n.d.; *Rocket*

Propellants, n.d.). Both the fuel and oxidiser need to be stored in separate tanks and are fed through a system of pipes, valves, and turbopumps to a combustion chamber where their mixture burns to produce thrust (Carisch & Rickard-Martin, 2014). This complex structure adds extra weight to the rocket or missile (*Solid and Liquid Fuel Rockets*, n.d.). The chemical compositions of the fuel and oxidiser are also very toxic and corrosive, posing severe difficulty and dangers in handling (*Propellants*, n.d.). The fuel and oxidiser further require special storage outside of the rocket or missile, thus road-mobile liquid-fuel missiles would need to be fuelled at the launch site before launch, consuming time and leaving the missile vulnerable (Carisch & Rickard-Martin, 2014).

Liquid-propellant engines, however, have some advantages over their solid-fuel counterparts. Once the solid-fuel is ignited it will carry on burning until it is used up, eliminating the possibility of slowing down or turning off the propulsion (*Solid and Liquid Fuel Rockets*, n.d.). In case of a catastrophic launch failure, it would be difficult to avoid a serious accident. In the case of liquid-fuel propellent, the flow of fuel and oxidiser to the combustion chamber is controllable and, thus, the rocket engine can be throttled, stopped, or restarted (*Rocket Propellants*, n.d.).

Search for a reliable supplier for ballistic missiles logically pointed to China. After all, Pakistan and China had been long-term allies, had long-running military cooperation, were suspected to have cooperated on nuclear technologies, and had a common adversary in India. Moreover, not only was China not a member of the MTCR it was also opposed to the regime. By late 1980s and early 1990s, China had achieved extensive expertise in developing liquid-fuel missiles. Its experience in solid-fuel technology, however, was new. Pakistan, nevertheless, opted exclusively for the Chinese solid-fuel M-11 and M-9 SRBMs (M-series). For the liquid-fuel missile systems, Pakistan turned to North Korea, which had reverse-engineered Soviet Scuds in the mid-1980s to develop No-dong MRBM.

The acquisition of two different types of ballistic missiles from two different suppliers put in place a dual-track approach to ballistic missile acquisition in Pakistan (Cirincione et al., 2005). In the first instance, Pakistan was to acquire off-the-shelf Chinese solid-fuel missiles for its immediate operational needs as well as gain transfer-of-technology (TOT) of these missiles to create an indigenous technical base. The responsibility for absorbing and reverse-

engineering the solid-fuel technology was assigned to the National Defence Complex (NDC), a subsidiary of PAEC. The second instance had similar objectives but related to the North Korean liquid-fuel ballistic missile technology, responsibility for which was assigned to KRL (Hoodbhoy, 2013b, p. 105).

The dual-track approach essentially restarted the Pakistani ballistic missile programme from scratch as the previous indigenously designed missiles were phased out. The approach proved advantageous in two important ways. *First*, it enabled Pakistan to develop a robust missile technological base free of restrictions imposed by the MTCR (F. H. Khan et al., 2004). *Second*, it propelled Pakistan's ballistic missile programme ahead of India's. This is evident by the fact that by mid-2000s Pakistan had inducted M-11, M-9, Shaheen-I and Ghauri-I, while India, which had a considerable head start, only had Prithvi in service (Mehta, 2004). Additionally, both the M-series and No-dong missile were road-mobile, thereby offering enhanced survivability through dispersal.

3.4.1. Solid-Fuel Ballistic Missiles

Pakistan-China cooperation in the field of missilery can be traced back to the late 1980s. Many Western observers believe that China was instrumental in the development of Hatf-I and Hatf-II missiles. But the major Chinese contribution to Pakistan's ballistic missile programme came with the sale and TOT of latest M-11 (Dong Feng-11/CSS-7) and M-9 (Dong Feng-15/CSS-6) missiles. The two missiles represented a new class of Chinese ballistic missile capability, propelled by solid-fuel rocket motors, a technology that it previously lacked, and were largely based on indigenous designs (Bitzinger, 2000, p. 18). The TOT of the M-family missiles immediately provided Pakistan with a quantum leap in range and accuracy, two areas that had plagued Pakistan's technical base in the development of Hatf series (Hoodbhoy, 2013b, p. 105). Suffice to say, the M-series missiles not only provided Pakistan with its latest missile technologies and help establish sophisticated technical base but also provided rapidly deployable conventional missile force.

3.4.1.1. M-11 & Hatf-III Ghaznavi

China Sanjiang Space Group (CSSG), a subsidiary of China Aerospace Science & Industry Corporation Limited (CASIC), began developing M-11 in 1984-1985 and first flight-

tested the missile in 1990. The missile is a solid-fuel, single-stage, road-mobile SRBM with a range of 280km and a payload of 800kg. Though initially developed for exports, the missile was modified in 1990 for People's Liberation Army, which subsequently inducted the missile in 1992 under the designation of Dong Feng-11 or DF-11 (*DF-11 (Dong Feng-11/M-11/CSS-7)*, 2018). The development of an improved variant of the missile, designated as DF-11A, began in 1993. The new variant was first flight-tested on 6th October 1997 and commissioned into service in 1999. DF-11A had an extended range of over 500km-700km and improved accuracy by means of inertial guidance system as well as global positioning system (*DF-11*, n.d.).

The road mobility made M-11 difficult to locate and attack before it being launched (Cliff, 2015, p. 70). In November 1986, China advertised the entire line-up of M-family ballistic missiles, including the longer-range M-9, at the first Asian Defence Exhibition held in Beijing to gain export bids, apparently unaware of the MTCR, which was to be promulgated merely five months later in April 1987 (J. Wilson & Di, 1992). China subsequently not only showed disinterest in joining the MTCR but opposed the regime altogether. The norms set by the regime would nevertheless spell problems for China's missile exports.

First reports on China's dealing with Pakistan on the sale of M-11 appeared in early 1991 (R. J. Smith, 1991). However, negotiations between China and Pakistan for the sales of M-11 are suspected to have taken place in 1988 (Gertz, 2001, p. 268). China is believed to have transferred a training M-11 missile and launcher to Pakistan sometime in 1990, and a shipment of 30 to 34 M-11s reportedly arrived in Pakistan in November 1992 (Kristensen & Norris, 2015a; Medeiros, 1999). Around the same time, the U.S. intelligence claimed to have sighted the missiles stored in crates at the Pakistan Air Force (PAF) base in Sargodha. Apparently, the U.S. satellites captured construction of storage sheds for the missiles and their mobile launchers, and related maintenance facilities and housing for launch crews. The intel further claimed to have sighted soldiers practising simulated launches with advice from visiting Chinese experts (R. J. Smith & Ottaway, 1995).

After the discovery, the missiles were dispersed to alternatives sites inside Pakistan and China began supplying M-11s in unassembled form, which necessitated the creation of a dedicated missile assembly facility (F. H. Khan, 2012, p. 239). This too did not go unnoticed, and the U.S. intelligence concluded this now made it possible for Pakistani technicians to

assemble their own version of M-11 (Jehl, 1993). Indeed, these measures ended up establishing a permanent base for solid-fuel technology in Pakistan (F. H. Khan, 2012, p. 239). To facilitate the unassembled missiles and their TOT from China, a major organisational overhaul was undertaken by Pakistan in the early 1990s. Not only responsibilities were disseminated to various existing organisations, but also new ones were established (N. A. Salik, 2009, p. 208). For instance, by 1993 NDC was established to begin work on a new solid-fuel ballistic missile and Project Management Organisation (PMO) was established in 1994 to lay foundations for solid-fuel technology by means of absorbing the TOT and by learning reverse-engineering and assembly techniques unassembled M-11 as well as M-9 missiles (F. H. Khan, 2012, p. 239).

However, M-11 did not by default provide Pakistan with nuclear delivery capability. As an export item, the missile was only able to carry conventional payload. Moreover, Pakistan's first-generation nuclear warhead based on the Chinese CHIC-4 HEU-implosion device was too large to be carried by M-11. At approximately 1300kg the CHIC-4 exceeded M-11's capacity of 800kg payload (*Hatf-3/Shaheen-I/M-11*, n.d.). Pakistan thus began redesigning its warhead, and in 1996 a classified U.S. National Intelligence Estimate concluded that Pakistan may have succeeded in developing nuclear warheads for M-11 (R. J. Smith, 1996). Indeed, NDC and PMO had worked extensively to redesign M-11 to make it nuclear-capable (F. H. Khan, 2012, pp. 239–240). The extensive modifications resulted in the creation of new missile known as Hatf-III Ghaznavi.

On 2nd July 1997, Pakistani newspaper *Nawa-e-Waqt* broke the story that Pakistan had flight-tested a missile called Hatf-III. The missile was reported to have a range of 600km (Joshi, 1997). The range mentioned by some media outlets may have been based on the 1989 interview of General Beg with Jane's Defence Weekly in which he claimed that Pakistan was in the process of testing a 600km range missile (M. Hussain, 1989, p. 779). Some experts believe that Pakistan had indeed begun working on a third Hatf missile in 1997. The missile was claimed to be based on Hatf-II design, comprising of two-stages and larger boost motor to give it a maximum range of 800km (T. M. Khan, 2010, p. 104). The missile was, however, unlikely to have had a guidance system as per General Beg's confession that Pakistan lacked

the technology, contradicting his earlier claims of Hatf-I and Hatf-II's 'high accuracy' (M. Hussain, 1989, p. 779).

A large portion of Indian media and governmental representatives reacted negatively to the alleged flight-test of Hatf-III and alluded to India's own solid-fuel Agni ballistic missile as an available countermeasure ("Premier Interviewed on Relations with Pakistan, Security Issues," 1997). In reality, there had been no missile flight-test (N. A. Salik, 2009, p. 209). The confusion was likely caused by the reports of Pakistan's ground-test of missile engine destined for then under-development Shaheen-I ballistic missile (F. H. Khan, 2012, p. 240). However, much like in the case of The New York Times, the news may have been deliberately leaked to send a signal to India, which had recently stationed Prithvi SRBM in the town of Jalandhar close to the Pakistani border (Cirincione et al., 2005, p. 251; N. A. Salik, 2009, p. 209). Even if there was a 600km-800km Hatf-III in development the original project appears to have been terminated in 1994 but restarted in 1997 with the missile design now based around more accurate M-11 (T. M. Khan, 2010, p. 104).

The actual first flight-test of Hatf-III Ghaznavi took place on 26th May 2002 (F. H. Khan, 2012, p. 240). The missile had a range of 250km-290km, as opposed to 600km-800km reported by media outlets, and a payload of 500kg. Based on M-11's features, the short-range of the missile is believed to provide it with reduced flight time and depressed trajectory, enabling it to fly within the atmosphere and thereby making its interception by missile defences extremely difficult (Fisher, 2004; Stokes, 2000, pp. 119–120). Improvements in the missile's accuracy and structure continued to be made regularly both before and after its induction. The missile incorporates an inertial guidance system and uses jet vanes in the nozzle to make trajectory correction during the boost phase (F. H. Khan, 2012, p. 240). The warhead section is also stated to have a post-separation attitude correction system to further improve the accuracy during the terminal phase (Fisher, 2004). Pakistan conducted the second flight-test of the missile in 2003 and by 2004 the first batch of the missile was formally inducted by Army Strategic Force Command (ASFC). An improved second batch of Ghaznavi was inducted in April 2007. In 2008, ASFC carried out a training launch, signifying that the missile had been operational (F. H. Khan, 2012, p. 240).

The short-range of Ghaznavi puts its nuclear role in perspective. Although the missile can reach some key urban centres in the bordering Indian states like Gujrat, Rajasthan, and Punjab – including major cities like Ahmedabad, Haryana, and Chandigarh – its short-range is insufficient for carrying out countervalue targeting against cities, population centres, and industrial centres located deep inside India. Important targets like New Delhi, Mumbai, Bangalore, Hyderabad, Calcutta, etc., are impervious. The missile's strategic role is thus constrained. On the other hand, the missile offers significant utility as a counterforce targeting system against India's military assets situated within its range. This includes soft-point targets like mobile missile launchers; soft-area targets like air bases, army posts, and naval shipyards; and hard-point targets like missile silos and bunkers (Younger, 2009, pp. 100–101).

Some western sources suspect that the production of Ghaznavi was terminated in April 2007, having developed between 30 to 50 missiles (*Hatf 3 "Ghaznavi,"* 2016). It is not clear if these numbers are in addition to 30-34 units of M-11 supplied by China. It is possible that for better economisation of scarce resources further production of Ghaznavi for operational purposes may have been suspended, if not terminated, in favour of strategically more viable and technically more advance Shaheen missiles. In fact, some sources believe that Ghaznavi project may have been intended for developing technology for Shaheen and Ghauri missiles (*Ghaznavi*, n.d.). However, both Shaheen and Ghauri's revelations, or at least flight-testing, predate Ghaznavi's. Pakistan on its part has never announced the termination of Ghaznavi. Instead, it continues to flight-test it for both technical improvement and training purposes, with one latest test being carried out at night-time ("No PR-156/2019-ISPR: Pakistan Successfully Carried Out Night Training Launch of Surface-to-Surface Ballistic Missile Ghaznavi, Capable of Delivering Multiple Types of Warheads Up to A Range of 290 Kilometers," 2019).

3.4.1.2. M-9 & Shaheen Series

The development of M-9 by China Academy of Launch Vehicle Technology (CALT), a subsidiary of China Aerospace Science and Technology Corporation (CASC), began in 1985. The missile is a solid-fuel, single-warhead, single-stage, road-mobile SRBM. Much like M-11/DF-11 the missile is exported-oriented system and is only able to carry a single conventional warhead. The main difference between M-11/DF-11 and M-9/DF-15 is that the

latter has a greater range at 600km but lesser payload capacity of 500kg (Stokes, 2000, p. 120). Pakistan's interest in M-9 had been suspected since 1990 (McGeorge, 1990). The CD Directorate's feasibility studies recognised that M-9 fulfilled Pakistan's technical and strategic requirements and thus recommended the TOT of the missile. China is believed to have started transferring the missile or its components from 1991 onwards (F. H. Khan, 2012, p. 240). China's sale of M-9 to Pakistan has not been as popular a press and intelligence topic as M-11. It is, however, possible that the U.S. intelligence community viewed the two missiles interchangeably, especially after China started supplying the two missiles in unassembled forms.

Much like M-11, NDC and PAEC undertook major redesigning of M-9 to make it nuclear capable, and through their own efforts experimented with various ranges, rocket motors, and other technologies to build improved variants (Siddiqa, 2004). It would not be erroneous to conclude that the transfer of M-9 is the most significant military transaction between China and Pakistan as it put the latter's technical base on the path of a major learning curve for designing more advanced, nuclear capable, and longer-range solid-fuel ballistic missiles. The offshoot Shaheen series today serves as the cornerstone of Pakistan's nuclear deterrence.

3.4.1.2.1.Shaheen-I

Hatf-IV Shaheen-I was first disclosed during National Day Parade on 23rd March 1999, and then flight-tested on 15th April. Missile's stated range of 700km-750km exceeded the 600km range of M-9 but retained the original's payload of 500kg. While the missile was formally inducted in the ASFC in March 2003 (Kristensen & Norris, 2015a), Pakistani engineers and scientists continued to make improvements to the missile's accuracy and other technologies even after its induction (F. H. Khan, 2012, p. 241). The missile incorporates inertial guidance system and warhead post-separation attitude correction system, which improves the accuracy and possibly provides some degree of manoeuvrability to evade missile defences. Shaheen-I is also reported to employ stealthy warhead shaping to delay detection and complicate targeting by enemy's air defences. A similar feature is also believed to have been utilised on Ghaznavi (Fisher, 2004). On 25th April 2012, Pakistan flight-tested an improved variant called Shaheen-IA ("No PR-98/2012-ISPR2012," 2012). The missile is stated

to incorporate technical improvements and has an extended range of 900km-1000km ("No PR-254/2014-ISPR," 2014).

3.4.1.2.2.Shaheen-II

Pakistan first displayed Hatf-VI Shaheen-II during the National Day Parade on 23rd March 2003, a year ahead of its first flight-test in March 2004. The missile is a two-stage MRBM with a range of 2200km-2500km. At the time of its flight-test, it became the longest-range missile system developed by Pakistan and gave the country the ability to strike targets in much of India. Some experts believe that the missile is based on the Chinese M-18 ballistic missile, a two-staged version of M-11 with an extended range of 1000km-1200km (*DF-11 / M-18*, n.d.; *Hatf 6 "Shaheen 2,"* 2016). Pakistani scientists have, however, denied this claim and insist that the missile is built with their own efforts and that the previous Chinese transfers only served as the base technology (F. H. Khan, 2012, p. 241).

It is pertinent to add that no variant of M-11/DF-11 designated as M-18 or DF-18 has ever entered serial production. The improved variant of M-11/DF-11, known as DF-11A, is a single-stage SRBM with a maximum range of 500km-700km. Shaheen-II does not appear to have a publicly identifiable counterpart in the Chinese missile arsenal (Fisher, 2004). This may suggest that the Pakistani scientists and engineers may indeed have innovated Shaheen-II MRBM, using their experience gained from M-11/Ghaznavi and M-9/Shaheen-I projects. Though the Chinese assistance in this innovation cannot be ruled out.

3.4.1.2.3. Shaheen-III

On 9th March 2015, Pakistan flight-tested 2750km Shaheen-III MRBM, the longest-ranged missile developed by Pakistan till date ("No PR-61/2015-ISPR," 2015). The missile is also first to drop the Hatf nomenclature. Shaheen-III offers greater strike capability by covering India in its entirety, including the far situated and strategically important Andaman and Nicobar Islands, which India may potentially be developing as strategic bases. According to Gen. (R) Kidwai, Pakistan is not expected to go beyond this range as it comprehensively covers lands area that India might think of putting its weapons on ("A Conversation Gen. Khalid Kidwai," 2015; "No PR-61/2015-ISPR," 2015). While the range of Shaheen-III indeed appears to be India-specific, it does, however, provide a wide-reaching coverage over the

Middle East, including Israel, which is Pakistan's latent political and security concern. Some analysts have been sceptical of Shaheen-III's range, arguing that the actual range could be much lesser. Jeffrey Lewis, however, states that Pakistan has been working on a miniaturised nuclear warhead, which could enable Shaheen-III to deliver a nuclear payload up to 1700m (2700km-2750km) (T. Craig, 2015).

3.4.1.2.4. Ababeel

On 24th January 2017, Pakistan flight-tested 2200km range three-stage Ababeel MRBM featuring Multiple Independent Re-entry Vehicle (MIRV) capability. With India developing Ballistic Missile Defence (BMD) many had suspected that Pakistan might invest in MIRVs as a countermeasure. First reports of Pakistani engineers, with assistance from their Chinese counterparts, working on a MIRV capability appeared in 2010 (Hasan, 2010). Mansoor Ahmed, a Pakistani nuclear expert, had also alluded to Pakistan making improvements in its "existing capabilities," including the development of MIRVs for Shaheen-III to make it hard for Indian BMD to intercept it (T. Craig, 2015).

The basic design of Ababeel is, indeed, based on Shaheen-II and Shaheen-III but with larger nosecone to accommodate multiple warheads. Pakistani military's media wing, the Inter-Services Public Relations (ISPR), claims that the missile has the "capability to engage multiple targets with high precision, defeating the enemy's hostile radars" and that its "development is aimed at ensuring survivability of Pakistan's ballistic missiles in the growing regional Ballistic Missile Defence environment" ("No PR-34/2017-ISPR," 2017). The nomenclatures of both the 'Hatf' and 'Shaheen' have been dropped from the missile.

In the absence of further details on the Pakistani MIRV technology some experts have been sceptical as to whether Pakistan has been able to overcome the technical hurdles required for developing MIRV based missiles. Much like Shaheen-III, the important question has been whether Pakistan has been successful in miniaturizing warheads? Questions also persist on the availability of supporting capabilities required for operationalizing the missile. Franz-Stefan Gady (2017), argues that "it is possible that the Ababeel is a more robust and redesigned variant of Shaheen-III fitted with an improved terminal guidance system, among other modifications" but in order to operationalise the missile Pakistan would need to

"develop intelligence, surveillance, and reconnaissance (ISR) capabilities including satellite technology," in particular by utilising the Chinese Beidou-II satellite navigation system.

3.4.2. Liquid-Fuel Ballistic Missile

The template for Pakistan's liquid-fuel ballistic missiles is the North Korean No-dong medium range ballistic missile (MRBM). The missile is believed to be an upscale version of the Soviet R-17 ballistic missile, popularly known as Scud-B. North Korea is believed to have acquired 300km range Scud-B from Egypt in the 1980s and undertook extensive modifications, including lengthening of the missile to accommodate increase in propellent capacity and thereby extend the range from 300km to 1000km-1300km. Development of the missile began in 1988-1989 and the first flight-test of the missile reportedly took place in 1993. Pakistani officials reportedly visited North Korea to discuss No-dong's purchase as early as 1992, official negotiations began in 1994 and successfully concluded in 1995, and the missiles began arriving in 1997.

The acquisition paved way for the development of the localised version known as Ghauri, development of which not only provided Pakistan with capability to strike most of the major Indian cities, but its range also exceeded that of India's Prithvi and Agni ballistic missiles, putting Pakistan in the front seat of long-range missile development in the region. The introduction of Ghauri renewed calls in India for reviving the Agni MRBM programme, which had been seemingly put on hold since 1994. It also served as an 'excuse' for India to conduct nuclear weapons tests in 1998.

3.4.2.1. Ghauri

On 6th April 1998, Pakistan carried out first flight-test of Hatf-V Ghauri – a year ahead of Hatf-IV Shaheen-I. North Korean engineers were reportedly present to witness, and perhaps also prepare, the flight-test. The single-stage missile was stated to have a range of 800km to 1500km and a payload 700kg to 1300kg, meeting the borderline requirement for delivering heavy warhead like CHIC-4 in the heart of India. The missile in its original form was, however, only conventionally armed. North Korea was not known to have a nuclear warhead programme at the time and was still a member of the NPT.

Although Ghauri was handed over to the ASFC in January 2003 it only became fully operational in 2008 after several more improvements and flight-tests. To its dismay, Pakistan found serious issues with the North Korean technology, including faulty guidance system that rendered the missile highly inaccurate ("North's Missiles Tied to Musharraf Blunder," 2013). The missile also lacked telemetry, which should have been obvious from No-dong's first flight-tests in 1993 when the missile did not send back telemetric transmission (Wright & Kadyshevb, 1994). No-dong/Ghauri also lacked adequate heat shielding, because of which it disintegrated in the air during its first two flight-tests.

While Ghauri was still going through its developmental phase, reports of Ghauri-II also began to emerge. The missile was reported to be a two-staged MRBM with a range of 1800km-2000km, providing ability to strike high-value targets situated in the furthest sides of India (*Hatf 5*, n.d.). Some experts believe that the development had similarities to North Korean Taepodong-I and that North Korean engineers stationed at KRL were possibly providing training and assistance to their Pakistani counterparts in engineering the the said missile (F. H. Khan, 2012, p. 245). On April 14, 1999, Pakistan tested what the press called Ghauri-II. However, this test was that of Ghauri-I.

Another rumoured development was of Ghauri-III, a two-stage intermediate-range ballistic missile (IRBM) with a propagated range of 3000km-3500km. Much like Ghauri-II the missile allegedly drew influences from Taepodong (F. H. Khan, 2012, p. 245). Some sources state that the missile was first flight-tested on 15th August 2000, but its development subsequently slowed down and a flight-test scheduled for June 2004 never took place (Cirincione et al., 2005, p. 251). Other sources, however, suggests that while the missile may have been under development no example of it was completed and flight-tested. According to A.Q. Khan about 50% of work on Ghauri-III was completed when the project was cancelled in May 2000 by General Musharraf ("Musharraf Stopped Funds for Ghauri-III Missile Saying: 'Do You Want to Destroy Israel,'" 2011).

In his interview with the researcher General (R) Kidwai clarified that Ghauri-III was nothing more than a proposal by A.Q. Khan and no work had commenced on the missile. Efforts were instead directed towards improving the original Ghauri. KRL scientists were tasked to work alongside with their counterparts from NDC, who had the expertise and

technologies required for making improvements to Ghauri. The collaboration eventually resulted in a revamped missile, the configuration of which did not equate to the original No-dong system (N. A. Salik, 2009, pp. 208–209). In 2004, An improved Ghauri was flight-tested (F. H. Khan, 2012, p. 246).

An inherent limitation of Ghauri is its liquid-fuel propellent, which requires the missile to be fuelled at the launch site, rendering it susceptible to detection by an Indian satellite or aircraft during launch time and thereby vulnerable to potential pre-emptive strikes (Kristensen & Norris, 2015a). Consequent to a plethora of technical problems and political pressure from the U.S. in the aftermath of the disclosure of A.Q. Khan's nuclear proliferation network General Musharraf declared that military cooperation with North Korea was over ("Pakistan-N. Korea Military Cooperation Over, Says Musharraf," 2009). Even though, existing units of Ghauri still appear to be in service they seem to have taken up a complementary role to the longer-range solid-fuel ballistic missiles like Shaheen-II, Shaheen-III, and Ababeel that now serve as the mainstay nuclear weapons delivery vehicles in Pakistan.

3.5. Other Missile Developments

Beginning mid-2000s Pakistan began diversifying its missile programme by investing in smaller and smart nuclear weapons delivery systems like cruise missiles and battlefield-range ballistic missiles (BRBM). In 2005, Pakistan flight-tested Hatf-VII Babur land-attack cruise missile (LACM) with a range of 500km, which was subsequently extended to 700km in 2007. An improved variant, Babur Weapon System-1B, also known as Babur-II, has also been developed (*Pakistan*, n.d.). The missile can carry nuclear and conventional payloads and incorporates inertial navigation systems as well as satellite navigation systems. More important features, however, are technologies like Terrain Contour Matching (TERCOM) and Digital Scene Matching and Area Co-relation (DSMAC), which enables the missile to fly at a "terrain-hugging" low altitude to avoid detection and "engage various type of targets with pinpoint accuracy even in the absence of GPS navigation" ("No PR-142/2018-ISPR: Pakistan Today Conducted a Successful Test of An Enhanced Range Version of the Indigenously Developed Babur Cruise Missile," 2018).

Experts believe that the Babur is either directly reverse-engineered from the

Tomahawk cruise missiles that had malfunctioned and fallen inside Pakistan when the U.S. fired them over the Pakistani airspace to strike at Al-Qaida targets in Afghanistan in 1998. Some sources also believe that the missile is derived from the Chinese CJ-10/DH-10, which in turn is also suspected to be reverse-engineered from the Tomahawk. Pakistan has demonstrated Babur's recent flight-tests from a Multi-Tube Launch Vehicle (MLV), which appears able to store and launch three such missiles.

On 9th January 2017, Pakistan conducted first flight-test of Babur-III submarine-launched cruise missile (SLCM) with a range of 450km. Pakistan had previously hinted at developing a nuclear triad comprising of land, air and sea strike capabilities, and the inauguration of the Naval Strategic Force Command (NSFC) Headquarters in May 2012 officially confirmed this intent. It is widely believed that Babur-III will be equipped on Pakistan Navy's (PN) Agosta-90B conventional submarines, which are equipped with air-independent propulsion (AIP) system that enables the boats to remain submerged for longer-durations. Pakistan is also in the process of acquiring eight AIP equipped conventional submarines from China, which are likely to serve as the actual platforms for Babur-III.

On 25th August 2007, Pakistan introduced its first air-launched cruise missile (ALCM) Hatf-VIII Ra'ad. The 350km nuclear-capable missile boosts similar features as Babur, including "terrain-hugging" low altitude flight with high manoeuvrability. The missile is designed to provide Pakistan with 'standoff capability' against targets situated on land and at sea ("No PR-104/2011-ISPR," 2011). On 18th February 2020, Pakistan flight-tested Ra'ad-II with a range of 600km. The platform for flight-tests has been PAF's older generation Mirage-III/V fighter aircraft but may also have been integrated on the newer JF-17 Thunder jets that Pakistan has developed in a joint-venture with China. The new aircraft may be the lead contender for all air-deliverable nuclear weapons in the future.

On 28th May 2002, Pakistan flight-tested the new variant of Hatf-II SRBM, designated as Abdali. At 180km range the missile is touted to provide Pakistan with "operational level capability" ("No PR-20/2013-ISPR," 2013). It can thus be deduced that the missile is designed to strike at Indian counterforce targets like military installations. Perhaps the most profound development is that of Hatf-IX Nasr, a battlefield-range ballistic missile (BRBM) designed as a tactical nuclear weapon (TNW). The missile was first flight-tested on 19th April 2011. The ISPR

press release stated that the missile was a quick-response system with a range of 60 km, was able to carry nuclear warhead payload of “appropriate yield” with “high accuracy,” and had “shoot-and-scoot” features (“No PR-94/2011-ISPR,” 2011). Additionally, Nasr is launched from MLV able store and fire up to four missiles. Range of the missile has subsequently been increased to 70km.

Nasr is believed to have been developed in response to India’s Cold Start Doctrine, which aims at conducting limited war, perceiving such operation to be below Pakistan’s nuclear threshold (“Testimony by George Perkovich Vice President for Studies Carnegie Endowment for International Peace,” n.d., p. 6). The development of Nasr may follow similar logic as that of NATO’s acquisition of TNWs. Given the greater size of the Indian landmass and the Indian armed forces, Pakistan may perceive that India may be able to continue with the war even after the destruction of its major population centres and thus to terminate the war it would be necessary to destroy advancing Indian forces by BRBMs/TNWs.

Development of smaller and tactical systems by Pakistan highlight three key points. *First*, Pakistan may have achieved sophistication in its warhead designs, including their miniaturisation. Pakistan has been making significant strides in its plutonium production, which allows it to create smaller and lighter nuclear warheads with greater explosive yields. This is further crucial for the development of a thermonuclear capability in the future (Tkacik, 2010). This would also mean that Pakistan is able to develop miniaturised warheads for its Shaheen-III and MIRVed Ababeel MRBMs as well. However, given the fact that Pakistan has never tested a nuclear explosive device with a plutonium core the reliability of Pakistan’s tactical systems continues to be scrutinised. Some Pakistan analysts, however, suggest that twenty years of sub-critical cold tests of small plutonium bombs have given Pakistan sufficient confidence to introduce the systems without hot testing (Fitzpatrick, 2014, p. 25).

Second, the conjunction of the ballistic, cruise, and TNW missile systems aims to establish what Pakistani officials call "Full Spectrum Deterrence,” (FSD) a plan for creating a nuclear deterrent effect on the strategic, operational, and tactical levels of warfare (“Rare Light Shone on Full Spectrum Deterrence Policy,” 2017). Third, a possible shift in the deployment posture may take place. Since nuclear tests in 1998, Pakistan has asserted that it maintains its nuclear forces under a centralised command structure, with delivery vehicles

stored in an undeployed posture and de-mated from their nuclear warheads. However, the advent of Nasr TNW and Babur-III SLCM may necessitate shifting from this policy. As quick response systems, the authority over these weapons may need to be decentralised and delegated to field and naval commanders. The missiles stored inside the launch-barrels or submarine launch-tubes may also require them to be stored in a deployed and mated form.

3.6. Mere Imports or Indigenous Missiles?

The Chinese and the North Korean assistances have been significant to Pakistan's ballistic missile programme. However, to conclude that Pakistan's missiles are mere imports would be erroneous. The programme has been a mix of both foreign assistance and indigenous efforts. The acquisition of complete missile systems from China and North Korea were only short-term solutions for addressing conventional threats. However, decades after their procurement these missiles are not known to have been ever deployed by Pakistan. The long-term objective was to create technical know-how and establish an industrial base through external assistance that would subsequently enable Pakistan to develop dual-use missiles on its own and impervious to the MTCR sanctions. Pakistani engineers have since acquired extensive knowledge in rocketry and missilery through reverse-engineering and by getting an education in designing and developing advanced technologies like rocket propulsion and guidance system (Hoodbhoy, 2013b, pp. 105–107).

In his interview with the researcher, General (R) Kidwai, explained that upon its inception in late 1998 the SPD inherited Hatf-I, Shaheen-I, and Ghauri ballistic missile projects. However, none of these missiles were validated systems. The missile programme was essentially recalibrated under SPD's supervision, heavy investments were made for expanding the infrastructure, and all the firefighting and solutions were handled locally without any dependency on foreign suppliers. In essence the missile development was pursued indigenously after SPD took over the supervision of the programme.

Data narrativised in this chapter leads to the belief that while Ghauri, Ghaznavi, and Shaheen-I may have been designed around the templates of ballistic missiles supplied by North Korea and China, but subsequent ballistic missile developments appear to be more evolutionary where Pakistan has been gradually phasing out the North Korean and Chinese

templates as the base-technologies. Many experts have similarly echoed their beliefs that Pakistan's ballistic missile developments have indeed come a long way from their Chinese and North Korean origins. The U.K based missile expert Duncan Lennox states that while the similarities may indicate that the design of the Pakistani Ghauri and Shaheen-I may have been inspired by the North Korean and Chinese missiles, it does not definitively lead to the conclusion that these missiles are direct copies of the original North Korean or Chinese missiles (N. A. Salik, 2002a).

The original Chinese M-series solid-fuel missiles appear to have been utilised as learning technologies and the analogous Pakistani variants, particularly Shaheen series, are Pakistani ingenuity. Aeysha Siddiqa (2004), writes that Shaheen series flows out of a fairly indigenous programme in which NDC and PAEC seem to have experimented with various ranges and rocket motors. Indian missile expert Rajaram Nagappa (2006, p. 5), observes that the lengths of Shaheen-I's rocket motor are longer than the rocket motor lengths of M-9 SRBM and the trend in the missile's development shows progressive increase in lengths, which shows that Pakistan may have internalised the technology obtained from the Chinese and could now do things on its own. Richard Fisher (2004), an expert on China and other Asian militaries, concludes that the development of Shaheen-II does not appear to have any publicly identifiable counterpart in the Chinese arsenal. In his interview with the researcher, General (R) Kidwai (2022), also asserted that Shaheen series has progressed indigenously.

In his assessment of Ghauri, David C. Wright (1998, p. 232), argues that the missile appeared to be somewhat smaller and have a shorter range than No-dong, which supports assertions that North Korea did not transfer a complete missile, and may support Pakistani claims that it was an indigenous design, albeit one that drew heavily on foreign technology and expertise. The problem in Wright's assessment, however, arises from the fact that it was based on the observations made from the first Ghauri missile that was flight-tested in 1998. Since Pakistan only began receiving No-dongs in 1997 it is unlikely for it to have put in place infrastructures proficient enough to satisfactorily indigenise or make substantial modifications to the missile in short span. *Secondly*, Wright's assessment also assumes that the ground test of a missile engine in 1997 may have been of an engine used in Ghauri. As stated earlier in this chapter, the concerned engine test was, in fact, of solid-fuel engine for Shaheen-I, whereas Ghauri is liquid-fuel.

The underlying issue here is of the rocket engines of No-dong. Some experts believe that North Korea was not able to build rocket engines at the time. Wright (1998; with Kadyshevb 1994), however, appears cognisant of the issue and suggests that North Korea likely utilised "Scud-type engines" in its No-dong, and it was possible that Pakistan also had either developed or purchased similar engines. Given Pakistan's weak technical base on liquid-fuel propulsion at the time it is unlikely for it to have developed a liquid-fuel rocket engine on its own. Pakistan may have thus purchased Scud-type engines, most likely from North Korea itself. Whatever the case may be, Pakistani Ghauri inherited the same technical and technological deficiencies that plagued No-dong.

General (R) Kidwai explained to the researcher, to circumvent the deficiencies and in the national interest he recommended that KRL engineers, who were struggling to find solutions to Ghauri's issues, should collaborate with their counterparts from NDC, whose Shaheen-I project was progressing relatively successfully. The collaboration eventually worked out good solutions to Ghauri's issues and its next flight-test was successful. General (R) Kidwai added that Ghauri which Pakistan possesses today is basically a KRL product but with a lot of technical inputs from NDC. The collaboration between KRL and NDC resulted in the introduction of numerous changes to Ghauri, which have altered the missile to the point where it is largely dissimilar to No-dong (N. A. Salik, 2020).

Pakistan's Dual-Use Missiles (As of 2022)

Hatf#	Name	Type	Propulsion	Range (KM)	Developer
Hatf-I	-	SRBM	Solid-Fuel	80	SUPARCO
Hatf-IA		SRBM	Solid-Fuel	100	SUPARCO
Hatf-II	Shadoz	SRBM	Solid-Fuel	180	SUPARCO
Hatf-II	Abdali	SRBM	Solid-Fuel	180	SUPARCO/NESCOM
Hatf-III	Ghaznavi	SRBM	Solid-Fuel	290	PMO/NESCOM
Hatf-IV	Shaheen-I	SRBM	Solid-Fuel	700	NDC/NESCOM
"	Shaheen-IA	SRBM	Solid-Fuel	900	NDC/NESCOM
Hatf-V	Ghauri	MRBM	Liquid-Fuel	1100-1500	KRL
Hatf-VI	Shaheen-II	MRBM	Solid-Fuel	700-800	NDC/NESCOM
Hatfi-VII	Babur	GLCM	Solid-Fuel	700	NDC/NESCOM
	Babur-IA	GLCM	Solid-Fuel	450	
	Babur-IB	GLCM	Solid-Fuel	900	

“	Babur-II	GLCM	Solid-Fuel	750	“
“	Babur-III	SLCM	Solid-Fuel	450	“
Hatf-VIII	Ra’ad	ALCM	Solid-Fuel	350-550	AWC/NDC/NESCOM
“	Ra’ad-II	ALCM	Solid-Fuel	600	“
Hatf-IX	Nasr	BRBM/TNW	Solid-Fuel	70-90	NESCOM
-	Shaheen-III	MRBM	Solid-Fuel	2750	NESCOM
-	Ababeel	MRBM	Solid-Fuel	2200	NESCOM

CHAPTER 4: ANTECEDENT PHENOMENA

Antecedent phenomena are those whose presence activates or magnifies the causal action of the causal and/or explanatory phenomena (Van Evera, 1997, p. 16). These may include events, circumstances, or conditions that logically precede the causal/explanatory phenomena. In the case of Pakistan's ballistic missile acquisition much of the available literature presents the events and circumstances surrounding Pakistan's nuclear weapons programme and its India-centric security dynamics as the logical external antecedents.

4.1. Pakistan's Security Dynamics

Pakistan is by birth a security state, perpetually threatened by its larger neighbour, India. Its partition from India in 1947 was not amicable and the bilateral relations have, since the beginning, been marred by territorial disputes, predominantly over Jammu and Kashmir, a Muslim majority region that has wanted to cede from India and potentially to Pakistan. There is also a deep-seated perception in Pakistan that India had never reconciled with the partition and is determined to undo Pakistan, by force if necessary (P. I. Cheema, 1990, p. 1). Pakistan has further held a belief that India aims to establish a sphere of influence over South and Southeast Asia by ensuring that its neighbours exist in a weak state and that their foreign and defence policies are subject to India's assent (M. A. Khan, 1964).

India's relatively large and better equipped conventional forces, which had been and remain positioned primarily against Pakistan, are an important facet in sustaining Pakistan's perceptions about India's nefarious hegemonic and expansionist designs. Pakistan's international goals, almost from the time of its birth, had thus been simple:

a) Ensure its survival and territorial integrity against Indian conventional aggression
b) Protect its sovereignty against India's regional hegemonic designs
c) Bring about a solution to the outstanding issues like the Kashmir dispute in a manner that favours Pakistan

To achieve its goals, Pakistan sought to balance itself against India by acquiring advanced military capabilities. Lacking industrial and economic resources for building-up indigenous arms at the time and having failed in achieving acceptable results from talks with

India, Pakistan's search for security then manifested itself in the form of alignment policy (P. I. Cheema, 2002, p. 4). The U.S. being the more powerful and wealthy of the two superpowers at the onset of the Cold War was the preferred partner.

The U.S. was initially reluctant but subsequent convergence of views on the communist threat to South Asia in the 1950s paved the way for an alliance between the two countries (Siddiqa, 2001, p. 1). In May 1954 the two states concluded *Mutual Defence Assistance Agreement* whereby the U.S. pledged to provide military equipment and training to the Pakistani forces, and in September Pakistan joined the U.S. led *Southeast Asia Treaty Organisation*. In 1955, Pakistan became a member of the U.S.-backed Baghdad pact, later renamed as *Central Treaty Organisation*. In 1959, the two states further concluded a bilateral *Agreement of Cooperation* whereby the U.S. pledged to defend Pakistan's territorial sovereignty (Larson, 1994, p. 90). Pakistan's association with the U.S. and U.S.-led multilateral alliances led it to be termed as America's most "allied ally" and it paved way for Pakistan to benefit from a considerable U.S. economic and military assistance (Z. A. Bhutto, 1969, p. 6).

However, the interests and expectations of both Pakistan and the U.S. from their alliance were divergent and misplaced. While Pakistan sought to use the alliance as means of offsetting the Indian threat, the U.S. viewed the alliance solely through the prism of superpower competition and had little interest in allaying Pakistan's fears about India (F. H. Khan, 2012, p. 9). Much to Pakistan's consternation the U.S. assured the Indian leadership that its *Agreement of Cooperation* with Pakistan was not applicable against India (M. A. Khan, 1964). Other events such as the U.S. arms supply to India during its war with China in 1962 without prior consultation with Pakistan (as the U.S. had previously promised it would do), imposing of military sanctions by the U.S. against Pakistan in the wake 1965 India-Pakistan war, and the failure of the U.S. to protect Pakistan in the 1971 war against Indian aggression, completely disillusioned Pakistan's belief in the alliance relationship with the U.S. (P. I. Cheema, 2002, pp. 31–32).

Just as it became abundantly clear to Pakistan that the U.S. would not serve as its 'strategic equaliser' against India an unlikely alternative emerged in the neighbourhood, namely the communist People's Republic of China, which in 1962 had inflicted a humiliating defeat upon the Indian Army and occupied parts of the disputed Indian Occupied Kashmir.

While China too was unable to physically intervene in Pakistan's wars against India it provided an unconditional diplomatic support and maintained a steady supply of arms and funds to Pakistan to make up for the loss of the U.S. military assistance (Small, 2015, pp. 15–16).

Although the Chinese military equipment was qualitatively inferior to their U.S. counterparts, they were less costly, and came with significantly less political implications and disruptions in supply. Since the forming what the two states call an "all weather" friendship China has become a cornerstone in Pakistan's foreign and defence policies, where it serves a key benefactor of Pakistan's military needs. To ensure Pakistan's survival and simultaneously keep India in check, China reportedly extended assistance to Pakistan's nuclear weapons programme and later became the principal contributor to Pakistan's ballistic missile programme. This aspect is subject discussion in *Chapter 5: Causal Phenomena* to understand how and why China served as a Causal Enabler of Pakistan's ballistic missile programme.

4.1.1. Nuclear Dimension – Strategic Rationale

Disenchanted with the U.S.-alliance, intuiting a clandestine Indian nuclear weapons programme, and sensing an international urgency for a nuclear non-proliferation treaty, one which would close doors on Pakistan's options, Pakistan's Foreign Minister Zulfiqar Ali Bhutto began advocating for a similar Pakistani programme in the 1960s (Z. A. Bhutto, 1969, p. 130; Fitzpatrick, 2014, p. 14). His overtures for such a programme, however, failed to find an audience in the military led Pakistani government. Bhutto (1969, p. 149), subsequently put his case in his book *The Myth of Independence* in 1969 expressing concerns about potential Pakistani territorial attrition because of growing Indian military power and possible Indian acquisition of nuclear weapons.

In 1971 Pakistan did eventually suffer a territorial attrition by the hands of India when it assisted the disgruntled East Pakistan province (now Bangladesh) to breakaway. In 1974, Bhutto's intuitions about Indian nuclear weapons programme also proved to be correct when India conducted its first nuclear explosion – dubbed as Smiling Buddha – by exploiting its Western supplied civilian nuclear facilities and fuel. India called its test a 'Peaceful Nuclear Explosion' (PNE). For Pakistan, however, the test was anything but peaceful. It constituted a

radical qualitative shift in the strategic landscape of South Asia in India's favour, giving it an unprecedented power of what Pakistani experts term as 'nuclear blackmail' (P. I. Cheema, 2002, p. 30, 2011, p. 12).

Bhutto, who took the rulership of Pakistan after the 1971 war, saw India's test as a step towards weaponisation, and thus set about to recalibrate the strategic balance. A tentative decision to acquire nuclear weapons had already been made as early as 1972 but the existing nuclear facilities were insufficient and safeguarded under the International Atomic Energy Agency (IAEA). To respond to the Indian test in the near-term Pakistan sought a nuclear umbrella from one or the other nuclear powers. When no such guarantees were provided Pakistan began pushing for a *Nuclear-Weapons Free Zone in South Asia* under the patronage of the United Nations, only to be rebuffed (P. I. Cheema, 2002, p. 30).

Over the years, even at different stages of its own nuclear weapons programme, Pakistan proposed multiple regional nuclear arms control measures, including simultaneous signing of Nuclear Non-proliferation Treaty (NPT), all of which were rejected by India. Many of the proposals, however, appear to have been made to portray Pakistan as a responsible state, a reluctant pursuant of nuclear capability, and to divert international criticism away from Pakistan to India.

Pakistan subsequently sought to expand its civilian nuclear programme, in hopes that it would provide Pakistani scientists with an all-encompassing expertise in the nuclear field. For this Pakistan negotiated a reprocessing plant with France, which was to be operated under the IAEA safeguards, but Washington interpreted deal as having a potential for atomic bomb making and exerted pressure on both Pakistan and France to abandon the agreement, eventually leading to a unilateral French withdrawal from it.

Similar agreement for civil nuclear cooperation with other supplier states were also unilaterally cancelled (M. A. Khan, 1994). In April 1979, the U.S. cut off all economic and military aid to Pakistan because of its alleged nuclear ambitions, stranding it in an even weaker position against growing Indian military power. Pakistan views the muted U.S. response to India's nuclearization and pre-emptive punitive sanctions against it as a betrayal and as a way forcing Pakistan into acquiescence to India's regional dominance.

Top Pakistani scientist, Munir Ahmed Khan (1994, p. 197), criticised the Western attitude, saying that "for all purposes, it appeared that Pakistan was being punished for what India had done in misusing nuclear facilities supplied to it without safeguards." Many other Pakistani experts voice similar opinions, arguing that international non-proliferations regimes, such as the Nuclear Suppliers Group (NSG), had come in reaction to India's dishonest nuclear practices but it was Pakistan that had to contend with them, not just for acquiring nuclear weapons but also for legitimate civilian nuclear technology (N. A. Salik, 2009, p. 8).

Pakistan did, however, overcome the international constraints and succeeded both in expanding its civilian nuclear facilities with Chinese assistance and, through covert means, in acquiring centrifuge-based uranium enrichment capability for bomb-making. By mid-to-late 1980s, Pakistan had achieved a *de facto* nuclear power status. For the first time, since its independence, Pakistan now possessed the ability to place at risk India's viability as a sovereign state (Reiss, 1994, p. 338). Nuclear weapons then proved to be 'strategic equaliser' to India.

During the period the U.S. policy towards Pakistan also shifted from preventing it from going nuclear to mitigating what was now merely an eventuality. The change in policy largely resulted from convergence of views on communist expansionism in the region arising from the Soviet occupation of Afghanistan. As the U.S. sought Pakistani cooperation to dislodge the Soviets from Afghanistan it lifted sanctions and reinstated the military and economic assistance. On one hand, the resumption of U.S. military assistance provided Pakistan with F-16 combat aircraft, a hallmark conventional acquisition that also doubled up as the nuclear weapons delivery vehicle and thus a crucial cog in Pakistan's nascent nuclear deterrence.

On the other hand, it provided leverage to the U.S. to restrain Pakistani nuclear weapons programme to remain below weapons level thresholds. Washington's assistance was, however, transactional, and brief. In 1991, just as the Soviets decided to withdraw from Afghanistan, the U.S., citing progression in Pakistan's nuclear programme, reimposed sanctions on it. Ironically, where sanctions were intended to dissuade Pakistani nuclear weapons programme, they only seem to have released Pakistan from the U.S. leverage and allow it to continue the programme with greater impunity and prepare itself to carry out a live nuclear test at a moment's notice (Stiles, 2013, p. 51).

Throughout the 1980s and much of the 1990s, both Pakistan and India maintained nuclear ambiguity, denying that they either had or intended on developing nuclear weapons, despite the contrary being obvious. Both were suspected to have had developed a handful of nuclear bombs. On 11th and 13th May 1998, India conducted Pokhran-II series of nuclear tests. The second coming of India's nuclearization had profound implications for Pakistan as it was authorised by a Pakistan-hostile right-wing Bharatiya Janata Party (BJP) government and coincided with India's massive military modernisation while Pakistan remained deprived of the U.S. military assistance and logistical support for the existing U.S. origin weapon systems, upon which it was heavily dependent. The offer of resumption of military assistance by the U.S. in exchange for Pakistan not carrying out a test was rendered insufficient as the gap in the conventional warfighting capability had widened significantly. Pakistan conducted Chagai-I and Chagai-II nuclear tests on 28th and 30th May, respectively. South Asian arms race then transitioned from a non-weaponised to weaponised nuclear deterrence.

4.1.2. Nuclear Dimension – Domestic Rationale

There are at least three noteworthy domestic aspects to Pakistan's decision to acquire nuclear weapons. *First* is Z.A. Bhutto's political interest. Bhutto is also the only civilian ruler to have exercised complete control and authority over the nuclear programme. The internal discourse on then nuclear option was initiated by him and subsequently decision to embark on a nuclear weapons programme was also his. By this virtue he is deemed as the founder of Pakistan's nuclear bomb. Bhutto sought to restore national prestige and add a new dimension to foreign policy by positioning himself as the leader of the Muslim world. He sought to consolidate his newfound position as the ruler of Pakistan by styling himself as the saviour and paramount guarantor of the country's national security. Nuclear option was deemed as a necessary mean to achieve these objectives.

Although, Bhutto's discourse on nuclear option emphasised predominantly on India-centric security compulsions, his rhetoric on the nuclear programme had only one challenger, the U.S. The mannerism of Bhutto's presenting of the U.S. threat to the nation underscored elements from the *Unifying and Identity-Creating Roles of Military Threats* hypothesis. In April 1977, in a theatrical move Bhutto took to the streets of Rawalpindi and displayed an allegedly intimidating letter from the Carter Administration demanding Pakistan to stop the nuclear

weapons programme (Chisti, 1990, pp. 58–59). An underlying argument was that it was unacceptable for the U.S. to have a Muslim state become a nuclear power. In essence, Bhutto sought to strengthen his political support and survival by reaching out to the U.S.-weary public and establish himself in their eyes as the bastion of Pakistan's security and sovereignty against the U.S. pressures and enforced dependency. Scholars of South Asia have questioned the reliability of Bhutto's claims of threats issued by the U.S. to his life and political survival on the nuclear issue.

Second important domestic factor was Bhutto's belief that given the supreme political importance for the nation of the potential use of nuclear weapons, control over such issues must inevitably rest with civilian political authorities, not the armed forces. He believed that the generals would never arrogate to themselves the decision to develop and possibly use nuclear weapons, and that the very existence of the nuclear programme would provide a means by which civilian authorities could gain greater control over armed forces, defense strategy, and doctrine (S. Ahmed & Cortright, 1998, p. 101). Bhutto's assumption may have its roots in his experience in dealing with military dictator President-General Ayub who along with many others in the military's top brass rejected Bhutto's discourse favouring nuclear option believing that such a course of action will jeopardise the U.S.-Pakistan alliance through which them military had become entitled to substantial American military assistance that had helped in the much-needed military modernisation.

When the nuclear weapons programme commenced under Bhutto's democratic rule, the more pressing concern for the military was to have the U.S. sanctions lifted, which had been placed on Pakistan after its war with India in 1965 and have the conventional weapons assistance recommence than to develop nuclear weapons or participate in the related decision-making. It therefore opted out of the programme. Military's disinclination towards the programme may have to do with the fact that in its developmental aspect the nuclear programme was purely technical and in the administrative aspect strictly political.

Bhutto's bomb politics, however, failed to save both his political career and life and he was overthrown by General Zia in 1977. In his book *If I am Assassinated,* which he wrote from his death cell, Bhutto (1979, p. 166), argued that Pakistan was on the threshold of full nuclear capability when he [forcefully] left the Government to come to the death cell, and

that General Zia has thrillingly given the opportunity away. If the book was intended to serve as a mean of overture to his constituencies to stand-up to Zia and thereby ensure his survival, release, and reinstatement it did not work.

However, Bhutto's bomb rhetoric did ensure the survival of the bomb programme and Zia did not do away with the nuclear weapons programme. Instead, he provided patronage to the uranium enrichment programme sanctioned by Bhutto and through which Pakistan would eventually acquire its first nuclear bombs. Zia's support for the nuclear programme was primarily conditioned by his drive to gain popularity and legitimacy within the country. However, over time the military began viewing the nuclear option as a potential 'equaliser' to conventional force imbalance vis-à-vis India.

According to Siddiqa (2001, p. 184), Zia's use of the country's nuclear ambitions for political purposes was to set a trend for future regimes too. Prime Ministers Benazir Bhutto, Nawaz Sharif, etc., despite their varied ideological backgrounds and inclinations, also supported the programme. However, Zia had also put in place a state system that would lead to tensions in civil-military relations over the strategic programme once the democracy had been reinstated in 1989. Often the military would exercise its organisational pressures on the civilian governments to extract unquestioning support and concessions for the programme but without having the civilian governments play any decisive role in it. This was possibly because as the military strengthened its institutional-administrative hold over the nuclear programme it not only came to accept it but also own it. It appointed itself as the ultimate guardian and custodian of the programme and deemed civilian governments as untrustworthy to administer it.

Third, behind Bhutto's ambition was nuclear technical bureaucracy's encouragement. It was Munir Ahmad Khan who had informed him of India's bomb potential and thereby motivated him to pursue similar path. According to Farhatullah Babar, a senior member of Pakistan People's Party that Bhutto founded, "if in India Nehru's nuclear vision was shaped by [Homi] Bhabha, the man who gave shape to Bhutto's nuclear vision was Munir" (M. Ahmed, 2012, p. 78). It was again Munir, along with physicist Dr Abdus Salam, who put the idea of French nuclear reprocessing plant in Bhutto's mind (Niazi, 1991, p. 59). In 1972, during the famous Multan Conference with nuclear scientists, Bhutto removed the serving chairman

PAEC Dr I.H. Usmani with Munir Ahmad Khan on the spot and tasked Munir to report directly to him (M. A. Khan, 1999). Removing of bureaucratic chain between himself and Munir underscores Bhutto's urgency and desperation to acquire nuclear weapons in the shortest time possible.

In 1974 after India conducted PNE, Bhutto become increasing frustrated with Munir's inability to achieve timely progress on the bomb programme and reprimanded him and other leading scientists who had claimed that it was child's play for them to make an atomic explosion similar to that of India (Niazi, 1991, p. 59). According to Salik (2017, p. 36), the scientists had promised to deliver the bomb in five years, which may explain Bhutto's frustration who ostensibly wanted to use the achievement to facilitate his re-election bid. What complicates this assertion, however, is that Bhutto's frustration came merely two years after the 'five-year promise' made by the scientists at the Multan conference, whereas the election would not take place until 1977.

The preferred route to the bomb was through plutonium reprocessing and as early as 1973 preliminary discussions with France had commenced for acquiring a reprocessing plant. Consequent to international pressures Pakistani nuclear establishment began seeking alternative route through uranium enrichment using gas centrifuge technology (M. Ahmed, 2012, p. 185; N. A. Salik, 2017, p. 42). PAEC had already undertaken substantial measures for enrichment programme and had even setup an experimental centrifuge cascades based on an Italian design in Rawalpindi. However, the real impetus for pursuit of the enrichment route to nuclear weapons came with the arrival of Dr A.Q. Khan (Nawaz, 2008, p. 341).

In July 1974, Prime Minister Z.A. Bhutto received a letter from Dr Abdul Qadeer (A.Q.) Khan, a Pakistani metallurgist working at the Urenco, a nuclear fuel company based in Almelo in Holland, which specialised in centrifuge-based uranium enrichment. A narrative or the mannerism of the narration surrounding the letter has become a legendary tale amongst most Pakistanis, where Dr Khan makes a dramatic entry just when his country needed him the most. Few have, however, questioned the actual intent of the letter. Salik (2017, p. 43), writes, "it is difficult to ascertain whether A.Q. Khan's letter instigated an interest in enrichment technology by PAEC or that it was just a coincidence that Dr Khan's approaching

Bhutto and PAEC's initiation of studies on uranium enrichment happened almost simultaneously."

A unique insight into A.Q. Khan's letter is provided by Kausar Niazi (1991, p. 60), who suggests that Dr Khan had in actuality sought to secure a job for himself at the Pakistan Steel Mills as a metallurgist. Dr Khan wrote that he could be an asset to the Pakistan Steel Mill, but no positive response was forthcoming from the Mill's bosses, whom he called inefficient. What caught Bhutto's eyes, however, was Khan's claim that he was "fully proficient in the intricate and complex field of enriched uranium production" owing to him working at Urenco. Niazi (1991, p. 61), recalls that Bhutto called Dr Khan for meeting in December 1974 and told him to forget about making steel products and instead chalk out a plan for going in for the enrichment of uranium.

In December 1975, Dr A.Q. Khan joined the uranium enrichment programme at PAEC's Engineering Research Laboratories (ERL). Dr Khan was soon dissatisfied with the methodical approach of PAEC and complained to Bhutto about it. Much as in the case of the Steel Mill, Dr Khan accused PAEC of being incompetent and lacking commitment. He took the Prime Minister in confidence that he would achieve the desired results quicker if he was appointed the head of the enrichment programme (N. A. Salik, 2017, p. 43). Dr Khan had further managed to get the otherwise disinterested military to support him in his quest to have the enrichment programme completely entrusted to him.

The fact that Bhutto wanted to obtain the nuclear weapons capability at all costs and shortest time possible played into A.Q. Khan's favour. PAEC methodical pursuit of the bomb objective was indeed slow and frustrating for Bhutto, who did not appreciate the fact that it was not an easy task to develop this technology. Dr khan's manipulation of the situation would often lead members of PAEC, including Munir, who was personally closer to Bhutto, to be castigated by the Prime Minister, resulting in their lowered self-esteem. Through his manipulations Dr Khan also managed to shift Bhutto's choice to his uranium enrichment path and away from PAEC's proposed plutonium route (Siddiqa, 2001, p. 186).

Consequently, Bhutto upgraded Dr Khan's status to director of KRL and gave him complete financial and administrative autonomy. Bhutto formed the *Project Coordination*

Board for supporting the enrichment programme. Dr A.Q. Khan was the project head and secretary of the board, reporting directly to the Prime Minister's office. Other members of the board included Mr AGN Kazi, Foreign Secretary Agha Shahi, Defence Secretary Ghulam Ishaq Khan, and chairman PAEC Munir Ahmad Khan (F. H. Khan, 2012, p. 150; N. A. Salik, 2020).

On the other hand, Bhutto kept PAEC under the Prime Minister's Secretariat and thus governmental regulations and control. This curious affair may have to do with the fact that KRL was tasked only with enriched uranium, whereas the remaining important tasks of developing the nuclear explosive device were still mandated to PAEC. Bhutto, nevertheless, personally oversaw both the organisations, maintaining direct access to him for both Munir and Dr Khan. In his *de facto* separating of KRL from PAEC, Bhutto split the metaphorical nuclear bureaucratic atom into two. Dr Khan's KRL and Munir's PAEC would become entangled in a bitter bureaucratic politics and for the race to the bomb as Dr Khan sought to carve out a separate parallel programme for KRL. It was out of this rivalry that the second [liquid-fuel] component of the dual-track ballistic missile programme came about.

4.2. Extrapolating Antecedent Conditions

Much of the scholarly explanations of Pakistan's rationale for pursuing a nuclear programme tend to be simplistic and guided by neo-realist *balance of power*, *action-reaction,* and *security imperative* theoretical models. At the heart of the balance of power theory is the realist assumption that states cannot expect the international system to protect them from threats (Stiles, 2013, p. 38). Pakistan had learned this fact in the hardest possible manner in 1971. Pakistani policy then shifted towards seeking internal solution to external problem, which involved developing nuclear weapons. *Security Model* posited by Scott Sagan (1996, p. 57), explains that "a state will seek to develop nuclear weapons when faced with a significant military threat to their security that cannot be met through alternative means," and "due to nuclear weapon's destructive capabilities, a state that seeks to maintain national security must balance against any rival state that develops nuclear weapons by gaining access to a nuclear deterrent."

Pakistani behaviour appears congruent with Sagan's explanations. It pursued nuclear capability as result of significant military threat from India, particularly from the technological qualitative change in the form of Indian nuclear programme, which the alternatives – i.e., allies who would directly intercede for Pakistan and/or proposals for cooperation with India to reduce military threats – failed to assuage. As a weaker state in the arms rivalry Pakistan was therefore compelled to react by acquiring a 'balancing' nuclear capability of its own. However, fundamental to Pakistan's nuclear programme is not merely its desire to counterbalance the Indian nuclear programme or deny India a nuclear monopoly in the region but to also restore the overall strategic imbalance created by India's relatively larger and better equipped conventional forces. For this reason, Pakistan has opted for a nuclear *first use* posture, similar to that of the NATO's against the Soviet Union in the European theatre (Narang, 2014, p. 57).

There are, however, significant differences that set the Cold War and South Asian arms race models apart. Unlike the U.S.-Soviet dyadic rivalry, the India-Pakistan nuclear arms race is characterised by geographically linked adversaries with incompatible rationales for pursuing strategic weapons. Many experts posit that the Indian programme results largely from the ambitions of its nuclear scientists, state run military R&D organisations, and civilian leadership, while the military has been kept out of loop (Hoyt, 2016, p. 187; Mastny, 2016, p. 187). Factors driving India's nuclear weapons acquisition thus include domestic political and bureaucratic motives, desire for international prestige and power, and technological pride. In contrast, Pakistani programme is, as stated, argued to be predominantly security centric. In essence, Indian internal pressures are exacerbating Pakistan's external threat perceptions, forcing it to readjust its military capability where necessary, especially against 'technological innovations' by Indian scientists and R&D organisations.

If indeed we are to accept that Pakistan's ballistic missile programme is an extension of its nuclear weapons programme and thereby its broader security paradigm, then India-centric security compulsions provide necessary antecedent condition, which is evinced in this discussion. Pakistan's arms dynamic or weapons acquisitions should then be explained in relation to the Indian military power. Therefore, any analysis seeking to determine 'causal phenomena' behind acquisitions of any weapon system by Pakistan needs to consider the

question of what qualitative military technological change in the Indian military power has triggered a Pakistani response.

According to Buzan and Herring (1998, pp. 117 and 128), in secondary arms dynamic – as opposed to the primary arms dynamics of great powers – less industrialised non-producer or part-producer states – which are wholly or partially dependent on weapons imports from great powers or major producers – cannot be considered as strict dyad. The two authors argue that even if the secondary arms dynamic is largely a local affair one cannot remove the influence of arms suppliers. External suppliers, they argue, affect secondary arms dynamics by determining the amount and the quality of the weapons supplied. They can inflate a secondary arms dynamic into an arms race, or at least arms competition, by pumping large supplies to one or both sides at low cost or they can try to restrict the quality and/or quantity of arms made available. As a state dependent on imports of some of the major weapon systems and technologies, Pakistani arms dynamic is secondary. Therefore, another important antecedent condition in Pakistan's arms dynamic is the influence of the extra-regional players like the U.S. and China, whose interests in the region, relationships with the regional states, and with each other, at times impose restricts and at times inflates the South Asian arms dynamic.

The role of the U.S. in the South Asian arms race is complex. It has been an on-again-off-again source of advance conventional military supplies for Pakistan. From mid-1950s to mid-1960s, the U.S. had inflated Pakistan's arms dynamic but later imposed embargo on it after the Pakistan-India War in 1965 and in doing so restricted the quality and quantity of Pakistani military power against increasing quality and quantity of Indian military power. The latter action was largely seen by Pakistan as its abandonment by the U.S., which later emboldened India to dismember its Eastern Wing in 1971. Both the inflation and restrictions were political in nature. One causal aspect of Pakistan's nuclear programme has been to reduce its delicate military dependency on the U.S. Even though, the U.S. is deemed as an unreliable security partner, its interventions in the regional conflicts are almost always welcomed. Pakistan has remained tied to the U.S. for diplomatic interventions for defusing nuclearised tensions with India. Since both Pakistan and India are capable of generating

intense international conflict the U.S., on its part, finds it difficult to turn a blind eye (Harvey, 1997, p. 119).

In Pakistan's case, China is an important benefactor of its military needs. Unlike the U.S., China has been consistently inflating Pakistan's arms dynamic without political hindrance. Not only has it been source of readily available weapons for Pakistan but has gradually assisted Pakistan in setting up arms industry of its own. A major Chinese contribution in inflating Pakistan's arms dynamic is cited to be its unwavering assistance in the latter's nuclear programme. In essence, China has been crucial in Pakistan's journey from a non-producer to a part-producer. Conversely, for India, China serves as a major geopolitical obstacle in its global power ambitions and its military cooperation with Pakistan is also an irritant. India's nuclear posture is thus directed at both China and Pakistan, though Pakistan's posture is exclusively India-centric, and China's tacitly remains focused on the U.S.

Despite the literature's excessive emphasis on external dynamic of Pakistan's nuclear programme there are significant domestic considerations acting as the driving factors as evinced by discussion in this chapter. Pakistan's quest for nuclear weapons resulted in major internal restructuring and expansion of nuclear R&D establishment, which subsequently gained a life of its own. Since General Zia's takeover, the nuclear programme has been remarkably predisposed to the Pakistani military's will. The military over the years developed its own organisational interest for controlling the programme and for maintaining distance between the programme and the civilian leadership.

These intricacies arising from the state institutions and weapons laboratories R&D organisations exhibit inter-bureaucratic and institutional rivalries as important factors influencing Pakistan's strategic weapons decision-making. Though they have often been highlighted in the literature academic studies have not paid greater attention them. For the application of complementary approach and to provide wholesome picture it is pertinent to identify and deliberate on the institutional rivalries as necessary antecedent conditions for understanding the dynamics of Pakistan's ballistic missile acquisition

CHAPTER 5: CAUSAL PHENOMENA

Causal phenomena are the phenomena doing the causing (Van Evera, 1997, p. 16). This chapter is concerned with explaining what factors have been instrumental in causing Pakistan's ballistic missile programme, particularly the dual-track missile systems. For the explanatory purpose the chapter recalls to the four distinguishable classes of triggering events identified by Colin Gray (1971, pp. 72–73). i.e. (1) a military-technological trigger internal to the arms race system; (2) a political trigger internal to the arms race system; (3) a military-technological trigger external to the arms race system; (4) a political trigger external to the arms race system.

As established in the preceding chapter, the necessary antecedent condition for Pakistan's weapons acquisition on external level is India-centric security rationale. Therefore, one needs to consider, based on a basic action-reaction premise, what qualitative change in the Indian military power triggered or caused a response or reaction from Pakistan. In the case of Pakistani ballistic missile programme, an overwhelming amount of literature qualifies Indian ballistic missile programme as the 'causal rationale.' In essence, the Indian programme serves as the *military-technological trigger* for the Pakistani programme. However, it is the conviction of this thesis that this argument and the imbedded action-reaction phenomenon are not thoroughly examined. This chapter would therefore survey the Indian ballistic missile programme and reviews the Pakistani response to it to determine if indeed the Indian programme has caused the Pakistani programme and if the action-reaction causal pattern is valid in Pakistan's case.

According to Gray (1971, p. 73), the action-reaction triggering potential of activities filtering into the arms race system from its environment must be given some attention. Gray questions whether the allies of the arms race principals should be considered as being internal or external to the arms race, though he concludes no general answer is possible. However, based on Buzan and Herring's commentary, the role of the external players in the case of secondary arms dynamic is too important to be ignored. As identified in the preceding chapter, the influence of the U.S. and China in inflating or restricting Pakistani arms dynamic provides important antecedent condition. It is thus crucial to survey what later actions

emanating from these two states have put Pakistan on the path to ballistic missile programme.

Vipin Narang (2014, pp. 8 and 55), explains that in the late 1980s Pakistan had adopted a *catalytic nuclear posture*, a strategy by which it employed its nascent nuclear weapons capability to compel the U.S. to assist it in crises with India. But the U.S. abandonment after the Soviet withdrawal from Afghanistan, which left Pakistan alone to face India's conventionally superior forces, forced it to shift to *asymmetric escalation nuclear posture,* a strategy that involves developing "capabilities and procedures that credibly enable the rapid and first use of nuclear weapons in the event of a conventional attack." After the shift, he states, Pakistan "enjoyed a marked increase in deterrence success against India (Narang, 2014, p. 11).

Narang's explanations of Pakistani posturing are mostly sound. It would be demonstrated in this chapter that the 'second' U.S. military cooperation followed by 'second' abandonment in the 1990s had significantly inflated and then restricted Pakistani arms dynamic vis-à-vis India. The latter action played a consequential role in Pakistan's decision to acquire ballistic missiles, a capability that adds credibility to Pakistan's *first use* posture, into its arms dynamic. Based on this explanation the U.S. serves as the key *political trigger external to the arms race system* in South Asia. The subsequent chapter i.e., 'External Intervening Phenomena,' which deals with the India-Pakistan conflict and crisis situations, demonstrates that Pakistan has issued *first use* warnings and backed them up with ballistic missile flight-tests during heightened periods of tensions, and that Pakistan capabilities, procedures, and postures have deterred India from undertaking conventional military misadventures.

It is evident from *Chapter-3* that China and North Korea have been crucial in Pakistan's ballistic missile programme. The technologies supplied by the two countries has been crucial into coming to being of the dual-track approach of Pakistan's ballistic missile programme. There is a belief that Pakistan's missile programme was spurred by the easy availability of foreign missile technologies, particularly of China. However, this chapter argues that neither China nor North Korea have *caused* the Pakistani programme but have enabled it by extending technological assistance only after Pakistan had taken decision to reinvigorate its missile programme. Nevertheless, they are an integral cog in the causal mechanism.

The assistance extended by these two states to Pakistan was motivated by political and commercial interests and the two states serve as *technological-political enablers external to the arms race system* in South Asia. However, their assistance was by no means unchallenged as the "easy availability" claim sets it out to be. A great impediment had been the watchdogging by the U.S. The relentless support of these external enablers in face of mounting international pressure is subject to discussion in this chapter.

5.1. India Ballistic Missile Programme: The Causal Rationale

Many experts and practitioners posit that India's missile programme has caused Pakistani programme. According to Mazari (1993, p. 258), Pakistan's missile programme has tended to develop in response to India's missile development programme and therefore can be regarded as a reactive one. Similarly, Pant and Bharath (2008), state that Pakistan's missile capability was spurred by the success of India's missile development programme as well as the easy availability of Chinese missile technology. Rodney Jones (2000, p. 10) in explaining the South Asian missile dynamics states, "as with nuclear weapon capabilities, India has set the pace in the acquisition of missile delivery capabilities on the subcontinent. Pakistan invariably has come from behind, usually facing tougher procurement obstacles and the consequences of greater planning uncertainty."

Pakistan's late Prime Minister Benazir Bhutto, whose premiership witnessed the development of Hatf-I and II and the acquisition of the dual-track missiles, explained, "the Indian Nuclear detonation in 1974 was followed by Pakistan's efforts to meet the threat by acquiring nuclear technology. The Indian decision to build missiles capable of carrying nuclear warheads was met with Pakistan's decision to build nuclear warheads, which could target Indian cities" (Panhwar, 2009, p. 273). Although, her statement underscores a broad action-reaction pattern in the India-Pakistan dyadic arms competition it is inconspicuous in establishing causal relationship between the two countries' ballistic missile programme, instead saying that Pakistan developed 'nuclear warheads' in reaction to 'Indian missile development.'

Indubitably Indian missile programme has had implications for Pakistan and the Pakistani programme may have been able to counteract or deter the threat to a significant

extant. However, despite the correlation and counterposing between the two programmes the fundamental academic query from arms racing perspective remains whether the Indian ballistic missile programme has *caused* the Pakistani ballistic missile programme? The bellow discussion section attempts to determine if indeed a causal relationship exists between the Indian and Pakistani ballistic missile programmes. For the purpose the chapter traces the history of Indian ballistic missile programme, its determinants, and the Pakistani response to it.

5.1.1. Indian Ballistic Missile Programme

India's interest in developing missile capability predates its nuclear weapons ambitions. In 1958, India established Defence Research and Development Organisation (DRDO). In 1961, Defence Research and Development Laboratory (DRDL) was established as a subsidiary of DRDO to facilitate R&D into guided missiles. With organisational structure in place India immediately sought to expedite a missile programme. In 1962, India and Switzerland jointly initiated Project Indigo for developing a surface-to-air missile (SAM). However, the project was just as soon cancelled by India once the Soviet Union decided to sell it the SA-2 (S-75 Dvina) SAM the same year. In 1972, India initiated Project Devil aimed at reverse engineering the SA-2 to produce an indigenous version. Although Devil's prototypes failed, leading to its cancellation in 1980, DRDO managed to develop two liquid-fuel propulsions from it. Coinciding with Devil was Project Valiant, an ambitious plan for developing an ICBM based on liquid-fuel technology derived from SA-2. Much like Devil this project did not achieve its desired objectives and was discontinued in 1972.

The oddity of India's early attempts at developing complex missile capabilities in the absence of any immediate security compulsion is a curious affair. According to Kampani (2003, p. 54), both projects resulted from an alliance of the scientific, political and bureaucratic decision-makers with their primary objectives being design competence and political symbolism. The military had no role in these projects. While the projects Devil and Valiant were unsuccessful they nonetheless provided Indian scientists and engineers with valuable experience and expertise in developing missile technologies – particularly liquid-fuel propulsion – that would prove instrumental for India's future missile projects. Moreover,

mere few years later, India would find a conduit, albeit a reluctant one, in its civilian space programme for a more effective execution of ballistic missile development.

By 1970s, Indian Space Research Organisation (ISRO) had established a modest rocketry infrastructure, but unlike DRDO it emerged relatively more successful in its rocket programme. In the first half of the decade, ISRO began serious strides for developing a solid-fuel propelled space launch vehicle (SLV), formally referred to as SLV-3. Throughout the developmental period of SLV-3 it was a common theme for the officials to exult that the rocket incidentally provided India with ballistic missile capability. In July 1974, ISRO's director Satish Dhawan gave a statement before a parliamentary committee that India could produce medium-range missiles with locally developed solid-fuel propellants and guidance systems. While ISRO was still some five years away from conducting the first flight-test of its locally built SLV the timing of the statement was still of significance as it followed the Pokhran-I/Smiling Buddha nuclear test conducted in the month of May (Mistry, 2003, p. 117).

In August 1979, ISRO carried out the first launch of SLV-3. The solid-fuel rocket drew influences from the U.S. Scout rocket, of which India had acquired the unclassified technological reports from the U.S, in 1965 (Conley, 1999, pp. 44–45; Mistry, 2003, p. 114; Speier, 2006). SLV-3's first flight-test was a failure with the rocket falling into the Bay of Bengal mere five minutes into its flight (Moltz, 2012, p. 117). However, the launch was enough to spur domestic excitement on India's potential to develop a long-range missile as an offshoot of SLV-3. In November a parliamentary committee was briefed that within six months of a political decision SLV-3 could be modified into an MRBM (Rao, 1981). Later Satish Dhawan once again ignited national passions by stating that SLV-3 could be converted into a longer-range IRBM with 1500km range (Elkin & Fredericks, 1983).

In the July of 1980, ISRO would achieve a major milestone. Not only did it successfully launch SLV-3 but in the process also placed Rohini satellite in orbit. ISRO followed this with the launch of Rohini-2 satellite in May 1981 (Moltz, 2012, p. 117). SLV-3 and the statements by ISRO's officials continued to play into the imagination of Indian nationalists and the bomb lobby, who either wanted to trumpet India's achievement in rocket science as its potential to develop an IRBM, modify SLV-3 into an actual IRBM equipped with an improved guidance system, or establish a close coordination between defence sector and the civilian space

programme to develop a new IRBM (Reddy, 2011, p. 319). Dr APJ Kalam, the project director of SLV-3 programme, was quick to put himself in the lead of those who supported modifying SLV-3 into a ballistic missile. Kalam postulated that the solid-fuel boosters of SLV-3 could be adapted into ballistic missiles of short and intermediate ranges, and possibly into an ICBM by adding "one additional solid-fuel booster" (Kalam & Tiwari, 1999, p. 54).

Despite having instigated the idea of converting SLV-3 into a ballistic missile ISRO's leadership resisted Kalam's proposal. Ostensibly ISRO wanted to keep the space and missile programmes separate to avoid international sanctions and ensure continued international cooperation in its space research efforts. However, it also wanted to guard its technological achievements from other organisations like DRDO (Kampani, 2003; Pillai, 2014). However, Kalam and DRDO would eventually get their ballistic missile programme. In 1981, Kalam was transferred to DRDO and in 1983 he set out to initiate the most successful phase of Indian missile programme under the rubric of Integrated Guided Missile Development Programme (IGMDP). Kalam's transfer from ISRO to DRDO created a cooperative bridge between the two organisations, which enabled IGMDP to utilise both the knowledge and technologies gained from DRDO's Project Devil and ISRO's SLV-3. The human, industrial and technological expertise and infrastructure developed by ISRO were now at DRDO's disposal for achieving quick results for IGMDP (Reddy, 2011, p. 319).

5.1.1.1. Integrated Guided Missile Development Programme (IGMDP)

Commenced in 1983 IGMDP envisaged development of five distinct missile systems. This included *Nag* third-generation anti-tank guided missile (ATGM), *Trishul* short-range SAM, *Akash* medium-range SAM, and more importantly *Prithvi* SRBM and *Agni* MRBM. Unlike projects Devil and Valiant, IGMDP was assigned a practical value. The feasibility study for the programme was presented to the head of DRDO, military services chiefs, and Defence Minister, signifying that IGDMP missiles, Agni asides, were not merely intended for research but were to serve in the Indian armed forces (Pillai, 2014, pp. 22–26). For the discussion here this research is, however, concerned only with Prithvi and Agni series of ballistic missiles.

5.1.1.1.1. Prithvi Series

Prithvi is a tri-series SRBM derived from technologies and experience acquired from Project Devil. According to Dr Kalam (1999, p. 87), Prithvi was designed as a "basic module for all future guided missiles in the country." Kalam explained that the missile had provision for modification from a long-range surface to an air missile system and could also be deployed on a ship. It is unclear as to what Kalam meant by "an air missile system" but Prithvi-I would subsequently spawn surface-to-surface Prithvi-II for Indian Air Force (IAF) and would further lend its technology for Prithvi Air Defence system, an exo-atmospheric anti-ballistic missile (ABM) system, one of the two components of India's (BMD) programme. In accordance with Kalam's claims a ship-launched Prithvi-III has been developed for the Indian Navy. Prithvi also served as the second-stage of India's experimental Agni ballistic missile. In essence, Prithvi stands as both a symbol of India's past efforts and its future schemes for missile development.

India conducted the first flight-test of single-stage liquid-fuel Prithvi (SS-150) on 25th February 1988. Developed for the Indian Army it has a range of 150km and a payload of 1000kg. The missile comprises of a strap-down inertial guidance system. DRDO's leadership claimed a Circular Error Probable (CEP) – a measure of missile's precision – of 50m. Independent estimates, however, put the CEP between 100m to 300m at a range of 150km (Mian et al., 1998). Prithvi-I is based on the concept of the U.S.' Army Tactical Missile (ATACM) and much like the ATACM it was conceived as a non-nuclear system (Tellis, 2001, p. 217). India accordingly is believed to have developed conventional high explosives, cluster munitions, and incendiary warheads for the missile (Z. I. Cheema, 2010, p. 271). Prithvi-I might also be able to carry chemical weapons, a stockpile of which India disclosed upon its accession to the Chemical Weapons Convention. Beguilingly India had previously informed Pakistan that it did not possess any chemical weapons stockpile when the two entered into a bilateral agreement on complete prohibition of chemical weapons in August 1992 (N. A. Salik, 2010).

Given the short ranges of Prithvi-I and its later two iterations, the missile series in its operational capacity is almost exclusively a Pakistan-specific weapon system. In 1994, India's then prime minister Narsimha Rao had assured the U.S. President Bill Clinton that India would not deploy ballistic missiles in the near term (Perkovich, 1999, p. 347). However, in 1997, Prithvi-I missiles were relocated to the town of Jalandhar near the Pakistani border, a move

that Pakistan construed as a deployment that potentially threatened some of its sensitive locations, including the capital Islamabad (N. A. Salik, 2020). The missile at the point was, however, not known to carry nuclear warhead, although the U.S. intelligence believed India was working to acquire the dual-use capability for its missile systems (R. J. Smith, 1997).

In the aftermath of its 1998 nuclear weapons tests India began discounting Prithvi-I's exclusivity to conventional mission in favour of dual-use role. Former Indian missile scientist A. Sivathanu Pillai (2014, p. 35) states that Prithvi had become more of a contingency strategic missile after the nuclear tests. Per Pillai's deliberations using Prithvi as a non-nuclear weapon during the early stages of a war risks sending a wrong message to the enemy. As the enemy would not be unable to determine the type of warhead the missile would be carrying it might assume the payload to be nuclear and retort with a nuclear missile strike of its own. Given the fact that Prithvi had started out as a conventional weapon system the "wrong messaging" factor would only hold relevancy in the period following Prithvi's modification to dual-use capability. This justification therefore does not satisfactorily explain the exact reasons that led to changes in India's assessments for making necessary modifications to enable Prithvi to carry nuclear payload.

According to Kampani (2003, p. 59), the decision to modify Prithvi as a nuclear weapons carrier was geared at consolidating the missile programme in three ways. *First*, it strengthened political and budgetary support for both Prithvi and Agni programmes. *Second*, it produced a change in the attitude of the armed services, which did not find Prithvi cost-effective as a long-range artillery. Once Prithvi became nuclear capable it started an inter-organisational rivalry between Indian Army and IAF for control of India's proposed nuclear deterrent. *Third*, the necessity of weaponizing nuclear devices and configuring them for delivery on aircraft and ballistic missiles strengthened the historic links between DRDO and the influential nuclear establishment.

Given its short-range, assigning nuclear mission to Prithvi is, however, inherently problematic and destabilising. According to Jones (2004, p. 48), the missile has "poor survivability characteristics." For Prithvi to effectively reach targets inside Pakistan the missile must be positioned close to the borders, which could make it susceptible to detection by Pakistani air surveillance and destruction by ground attack aircraft. The missile's liquid-fuel

feature further adds to its vulnerability. Given the poor probabilities of its survival against Pakistani nuclear '*first use'* or pre-emptive conventional strikes Prithvi suffers from "*use it (first) or lose it*" dilemma, creating a doctrinal conundrum for India's '*no first use'* pledge.

The fact that Prithvi is a liquid-fuelled missile makes it even more vulnerable to Pakistani ground attack assets. Jones (2004, p. 48), adds that the missile "is slow to move to a pre-surveyed site and to prepare for a launch. Its liquid-fuel makes the system highly combustible under attack. Although described as a mobile system, it is not easy to hide or move in a "shoot-and-scoot" mode, because of its ungainly design and large retinue of about a dozen support vehicles. Once in the field, it is a lucrative and vulnerable target for conventional attack." But the more important concern raised by Jones is of the possibility of Prithvi's nuclear warhead discharging on Indian soil because of Pakistani conventional strikes. In fact, the fear of Prithvi's nuclear warhead being discharged on Indian soil or the Indian forces falling to collateral damage from the nuclear fallout from Prithvi's strike on Pakistani targets had plagued the Indian strategic planners from the beginning.

Prithvi's survivability, safety, and readiness issues renders its strategic/nuclear role questionable. For these reasons and other technological shortcomings Prithvi series was and quite possibly continues to be a technical and operational bane for the Indian military. However, despite the technical limitations and the general displeasure of Indian Army with Prithvi-I, DRDO pushed ahead with developing longer-range variants of the missile. On 27th January 1996, India carried out the first flight-test of Prithvi-II (SS-250). Developed for the IAF the missile has an extended range of 250km but reduced payload of 500kg. The IAF is likely to use the missile in a counterforce role against Pakistan Air Force's (PAF) ground-based assets such as airfields and radar installations.

In 2002, management of Prithvi-II shifted from IAF to Indian Army, though IAF still provides target data (*Prithvi-I/II/III*, 2019). The change of management is attributed to the inter-organisational competition between the two forces to gain control over the nuclear weapons delivery systems. This is despite the fact that both services lacked interest in the missile due to its technical shortfalls (Kampani, 2003; Mian et al., 1998). Indian Army is also likely to have found longer range Prithvi-II more attractive as some Prithvi-II units have

reportedly been now inducted into the Army as well. In 2011, Prithvi-II was tested with an extended range of 350km ("Improved Prithvi-II Successfully Test Fired," 2009).

Plan for the development of ship-launched Prithvi-III came to public light in 1994 (*SIPRI Yearbook*, 1999, p. 358). The first-flight test of the missile eventually took place in 2000 from Indian Navy's (IN) ship INS Subhadra. The missile has a range of 350km and a payload of 500kg-1000kg. Unlike the first two iterations of Prithvi this third variant is a hybrid two-stage missile comprising of solid-fuel first-stage and a liquid-fuel second-stage. According to Indian media the missile also comprises of a surface-to-surface variant called Dhanush. Though most other sources identify Prithvi-III and Dhanush interchangeably. Dhanush is also believed to be intended for the IN and reportedly can strike targets at both sea and land ("Indian Navy Successfully Test Fires Dhanush Missile: All You Need to Know," 2015).

In June 2013, DRDO Chief Avinash Chander revealed that Prithvi-I will be replaced by 150km range Prahaar, a single-stage solid-fuel battle-field range ballistic missile (BRBM). The solid-fuel propulsion of Prahaar is likely to alleviate Indian Army's concerns with safety and readiness issues. However, the missile has not yet been disclosed to be a nuclear carrier. Given the relatively longer-ranges of Prithvi-II and III it is unlikely that these missiles would be replaced by Prahaar, despite Prahaar appearing to be more user friendly. This may, however, change if DRDO is able to extend the range of Prahaar in future.

5.1.1.1.2. Agni Series

Since India's overt nuclearization in 1998 the solid-fuel Agni series has emerged as its mainstay long-range nuclear delivery system. Agni today is available in the medium and intermediate range categories. However, the missile had seemingly started out as an experimental system or a technology demonstrator (TD) that was dubbed as "Re-Entry Experiment" or REX (Kalam & Tiwari, 1999, p. 55). Agni-TD was intended for validating India's capability to test key technologies such as re-entry vehicle (RV) – a slender cone that sits atop the missile and houses the warhead and its detonation mechanism – as well as the guidance system. The missile comprised of two-stage hybrid propulsion system. The solid-fuel first-stage was derived directly from SLV-3, whereas the liquid-fuel Prithvi served as its second-stage (Mistry, 2003, p. 115). The first flight-test of Agni took place in May 1989 where the

missile flew 1000km. The second test was conducted In May 1992, which failed. The third test was conducted on 19th February 1994, where the missile flew 1200km.

Despite identifying Agni as a 'technology demonstrator' Indian planners issued equivocating statements on the programme's military potential and serial production (Mistry, 2003, p. 110). For the Indian nationalists and members of its strategic enclave Agni programme was a pathway to strategic parity with China. The programme was assumed to be a precursor for a borderline-ICBM with a range of 5000km, able to target not just major Chinese cities like Beijing and Shanghai but also project India's power and strategic reach across Asia, Eastern Europe, Eastern Africa, and large swath of the Indian Ocean. The flight-tests of Agni-TD were also heralded by the Indian nationalists as a symbol of India's defiance and self-sufficiency in the face of the tenacious U.S. opposition to India's missile programme. This was echoed by Indian President Dr S. D. Sharma in the wake of Agni's third flight-test when he stated that the efforts to restrict India's access to foreign technology required India "to rely even more on [its] talents" (Perkovich, 1999, p. 340). Interestingly, India had also chosen to conduct Agni's second test when the first ever Indo-U.S. joint naval exercise was underway (Coll, 1992).

Agni-TD's R&D trajectory was, however, impeded by technical hurdles. The missile's Prithvi-based liquid-fuel second-stage had inherited Prithvi-I's readiness and safety limitations (Tellis, 2001, pp. 233–234). In 1994, prime minister Rao declared Agni programme as 'complete' and put the brakes on missile flight-testing much to the dismay of the pro-bomb lobby and nationalistic parliamentary opposition (Karp, 1998; Mistry, 2003, p. 117). Ironically, those who viewed India's missile programme, especially Agni's development, as a symbol of defiance of the U.S. non-proliferation agenda against India also held a belief that the U.S. pressure had resulted in Rao suspending missile flight-tests (Mistry, 2003, p. 117). The fact that the decision to halt missile flight-tests and prospective deployment came after Rao's visit to the U.S. fed into the perception. In 1996, Rao reversed his decision on missile flight-testing and further sanctioned the construction of a road-mobile version of Agni, likely intended for military use (Basrur, 2001). However, no missile test took place. As 1996 was an elections year the right-wing Hindu nationalist Bharatiya Janata Party (BJP) sought to exploit nuclear and missile issues for electoral gains.

The BJP issued an election manifesto promising to bring India out of nuclear opacity and pledged to "expedite the serial production of Prithvi and make Agni-I operational for the deployment of these missiles" and "hasten the development of Agni-II," a longer-range Agni variant reportedly underdevelopment at the time (*Election Manifesto*, 1996). The elections resulted in a hung parliament with the BJP led by Atal Bihari Vajpayee forming government that lasted only 13 days from 16th May to 1st June 1996. It was replaced by a coalition government under the banner of United Front with Janata Dal's H.D. Deve Gowda taking over the premiership.

On 5th December the coalition government suspended the Agni programme stating that 'Agni had been successfully completed' and restressed that it was not a missile but a "re-entry technology demonstrator" (Karp, 1998; Perkovich, 1999, p. 388; Srivastava, 2000). On 21st April 1997 Deve Gowda was replaced by his own party's I.K. Gujral. In July, with reports abound of a flight-test of a new 600km nuclear capable Hatf-III ballistic missile by Pakistan the Indian government began equivocating its stance on Agni programme. Prime minister Gujral responded to the reports by saying that "India's nuclear options are open" and that "the Agni missile programme has not been shelved" ("Premier Interviewed on Relations with Pakistan, Security Issues," 1997). However, no new flight tests of Agni took place in response.

In December 1997, the United Front government collapsed prompting fresh elections in February-March 1998. The BJP once again issued an election manifesto almost like the previous one. On missile issue it promised to "expedite the development of the Agni series of ballistic missiles with a view to increasing their range and accuracy" (*Election Manifesto*, 1998). The BJP emerged as the largest single party in the parliament and formed a coalition government with number of regional parties under the rubric of National Democratic Alliance (NDA). Vajpayee once again took on the mantle of premiership and this time immediately set about to deliver on his party's election manifesto. Between 11th–13th May, in little less than two months of BJP/NDA's coming to power, India carried out Pokhran-II series of nuclear tests. In December, prime minister Vajpayee assured the parliament that Agni test flights would resume (*SIPRI Yearbook*, 1999, p. 359). In the same month India also confirmed the development of Agni-II missile (Anthony, 2000, p. 671).

The flight-test of the aforementioned Agni-II took place on 11th April 1999 where the missile flew 1250km (Pant & Bharath, 2008). The two-stage MRBM was completely sold-fuelled, having gotten rid of the problematic Prithvi based liquid-fuel second-stage. The new solid-fuel second-stage was developed by ISRO, which by the 1990s had opened up to directly contribute towards Agni programme (Kampani, 2003). Furthermore, the new missile was intended for military use and designed to carry nuclear payload. Agni-II's development contradicted India's stance on Agni programme being austerely experimental. However, India had also not made a big secret of its intent to develop an operational missile from Agni. As stated earlier, prime minister Rao had sanctioned the development of a road-mobile Agni in 1996 (Basrur, 2001).

In October 1996, while confirming the suspension or termination of Agni programme an Indian parliamentary committee also asserted that a missile from Agni's technology could nevertheless be produced at an appropriate time consistent with the prevailing threat perception (Mistry, 2003, p. 117). An explicit reference to the missile was also made in the BJP's 1996 election manifesto followed by an implicit one in the 1998 election manifesto. Since it cannot be expected of DRDO to develop a missile like Agni-II in a year's time it can be concluded that the development of the missile had been ongoing during the period India claimed to have suspended the Agni programme. In 2001, India conducted the second flight-test of Agni-II where it demonstrated a range of 2000km. In 2010, India tested extended range Agni-II+, which failed (Kristensen & Norris, 2012).

Prior to the May 1998 nuclear tests many Indian analysts presumed that enhancements could be made to Agni-TD by adding newer and better solid-fuel propellants to develop a new China-specific Agni-II missile with a range of 5000km (*SIPRI Yearbook*, 1999, p. 359; Tellis, 2001, pp. 233–234). This, as evinced, did not transpire at whim. Not only did Agni-TD fail to demonstrate a potential beyond 1200km-1400km range but the presupposed enhancements also did not immediately guarantee ranges beyond 2000km-2200km. However, where Agni-II failed to sufficiently target major Chinese urban centres like Beijing and Shanghai the missile did provide capability to target Pakistan in its entirety from a safer distance. The Indian nationalist's obsession with 5000km range Agni, however, persisted. In 2001, the BJP's President Jana Krishnamurthy stated that India was in the process of

developing Agni-III with 5000km range, and that the missile will herald India's entry into the ICBM field (N. A. Salik, 2002b).

The next iteration of Agni, however, took an exponential step backward in terms of range. In January 2002, India carried out the first flight-test of single-stage Agni-I with a range of 700km. This missile is not to be confused with Agni TD. It instead owes its origins directly to Agni-II as it is solely comprised of Agni-II's first-stage (*Agni-1*, n.d.). Agni-I is Pakistan-specific missile and is intended to fill the gap between ranges of Prithvi-I/II (150km/250km), which were not deemed optimal for deep strikes inside Pakistan, and the 2000km Agni-II (2000km-2200km), which was deemed to exceed the requirements for striking targets situated deep inside Pakistan (Mistry, 2005, p. 55). Since the introduction of Agni-I the programme has, however, been put back on the trajectory to develop longer range missiles with an eye on China.

In August 2006, India eventually carried out the flight-test of the much anticipated two-stage solid-fuel Agni-III IRBM. Although at 3000km range Agni-III surpassed Agni-II as India's longest-range missile it fell short of the long desired and its publicised range of 5000km. The missile is nevertheless capable of engaging targets deep inside China, including its major urban centres. While most analysts identify Agni-III as exclusively China-centric the missile is, however, also suitable for use against Pakistan. At the time of its first test the missile provided India with ample geographic distance to safely launch nuclear and conventional strikes on Pakistan without having to put the missile in the path of Pakistani air and missile strikes since the longest-range missile (i.e., Shaheen-II) flight-tested by Pakistan had a relatively lesser range of 2200km-2500km.

On 15th November 2011, India conducted the first flight-test of 3500km-4000km range Agni-IV IRBM. Compared to the other missiles Agni-IV suffers from publicity obscurity. The two-stage solid-fuel missile was first considered to be a technology demonstrator wedged between Agni-III and then-underdevelopment Agni-V (Kristensen & Norris, 2012). However, after the missile's flight-test in January 2014, it was stated that the 'missile was ready for induction into the Army' and that the missile would 'enter into serial production' (Subramanian, 2014). Agni-IV offers advantage over Agni-III not only in range but also in

mobility. The missile's flight-test took place from a road mobile TEL, whereas Agni-III was still primarily rail mobile at the time (*Agni-IV*, n.d.).

India finally achieved its much sought-after range of 5000km with Agni-V flight-test on 19th April 2012, over two decades after Agni-TD's development. On revealing the missile, DRDO also claimed to be working on missile canisters and MIRV capabilities. Though Agni-V is generally of a lesser concern to Pakistani planners as its use against Pakistan would be a costly overkill, DRDO's hype to develop MIRV and canister capabilities for Agni-V or possibly for future Agni missiles is likely to play into Pakistani threat perception. Pakistani planners may assume that the publicised MIRV capability, if successfully developed, could find its way onto the Pakistan-specific iterations of Agni as well. If needs be, the MIRV based long-range missiles could also deployed against Pakistan during a conflict for better economisation of delivery means. For its part, Pakistan has itself flight-tested a MIRV capable Ababeel ballistic missile, although, much like India, the MIRV capability itself has not been publicly demonstrated so far.

Similarly, Pakistan may reasonably assume India's missile canister development to be detrimental for the dyadic nuclear deterrence. Missile canisters serve in a multifaceted and simultaneous role of shipping/mobile storage units, environmental damage protection units, as well as launch tubes. After their 1998 nuclear tests both India and Pakistan declared that they would keep their nuclear arsenal in a recessed posture. This meant that the two states would maintain their nuclear arsenal in undeployed and de-mated forms (i.e., warheads separated from missiles and other delivery systems and stored in different locations). Missile canisters, however, would require India to depart from this posture as it would have to store Agni-V mated with nuclear warhead(s) inside the canisters and thus in a launch-ready position. DRDO officials have hinted that previous Agni iterations may also subsequently be canisterised.

5.1.1.2. Determinants of the IGMDP

At first glance, India's ballistic missile programme is driven by its need to enhance deterrence against its adversaries. India perceives both Pakistan and China as a "two-front" threat to its national security. One important rationale posited by India for its missile

programme has been the Chinese sales of M-series ballistic missiles to Pakistan. However, since the Sino-Pakistan missile trade only began after India's development of Prithvi-I and Agni-TD ballistic missiles this rationale is essentially an addendum to India's programme. It perhaps is also an attempt at qualifying India as a victim of arms race perpetrated by Pakistan and China and to establish itself as a 'reactionary' party forced into the consequent action-reaction cycle. Contradictorily, the Indian scientific leadership downplayed the capability of China-supplied Pakistani missiles, claiming that India had a 'robust indigenous capability' superior to anything Pakistan had or could produce (Perkovich, 1999, p. 410).

A year after its overt nuclearization in 1998 India's then foreign minister Jaswant Sing (1999, p. xx) wrote that "India allowed Pakistan to overtake it initially in nuclear weapon capability and is now in danger of repeating that mistake in the missile field." This statement, perhaps another attempt at presenting India as a victim and a reactionary state in the supposed South Asian arms race, contradicted India's rhetoric that its indigenous missile capability was superior to Pakistani missile capability. Moreover, it was akin to describing India's situation as that of the U.S. during the alleged "missile gap" with the Soviet Union during the Cold War and much like the missile gap this narrative too was far from reality. By 1994 India had begun initial batch production of Prithvi-I and in 1997 it deployed less than a dozen of these missiles in Jalandhar, near the Pakistani border. Sometime in the second half of the 1990s India had also started developmental work on Agni-II. On the other hand, Pakistan only demonstrated its dual-track missile capability between 1998 and 1999 and was someway from starting batch production and deployment.

China has factored dominantly in the arguments that have favoured furthering India's strategic weapons programmes. Agni-TD had been presupposed by Indian planners and analysts as a precursor for a longer-range China-specific missile. Both prior to and after its May 1998 nuclear tests India's then defence minister George Fernandes claimed that China, not Pakistan, was the threat no.1 to India (Burns, 1998; Joshi, 1998). Prime minister Vajpayee also mentioned China as the rationale for nuclear tests in his letter to President Clinton (Chengappa, 1999). India's 'China threat rationale' for its nuclear and missile programmes was unconvincing at the time as Sino-India relations had seen remarkable improvements since both concluded series of military confidence building measures in 1988, 1993, and 1996.

A year after taking a vituperative stance against China the Indian leadership volte-faced on its China rationale, claiming India no longer perceives China a threat (Chengappa, 1999).

Chinese analysts, on the other hand, have dismissed India's 'China threat rationale,' calling it a "China threat theory," and hold an opinion that the Indian technological advancements, including IGMDP, are a facet of India's "great power dream" and an attempt to reach the same level that other countries, such as China itself, have already attained (Saalman, 2011, pp. 181 and 185). Pakistani thinkers hold same opinion. According to Jaspal (2001, p. 53), India uses China as a "yardstick" against which it measures itself and sees nuclear weapons and long-range missile capabilities as means to establish itself as a "strategic equal" of China on the global stage. Western experts have also posited similar conclusions. According to Dalton and Tandler (2012), India's pursuit of long-range nuclear capable missiles is tied to its desire to project economic and military power well beyond its immediate neighbourhood.

Indeed, the regional security rationales posited by India do not adequately explain its development of 5000km range Agni-V IRBM and ambitions to further develop ICBMs, which exceed its China and Pakistan requirements and are more suited for global power projection. Review of official statements on systems such as the 5000km Agni-V indicate that these developments are politically motivated and for showcasing India's technological prowess for finding a place in the "elite missile club" (Bedi, 2012). Nevertheless, India is rationally concerned with the China's political and military superiority, now more than ever, and despite having been dismissive China is irked by India's China-specific missile systems like Agni-III, which ranks highly on its list of concerns (Saalman, 2011, pp. 178–179).

Similarly, India's concerns with Pakistan hold considerable credence and its Pakistan-specific missile systems are of military value. Although India rationalised 'China threat' for its strategic weapons programme to the China wary international community it reserved belligerent rhetoric almost exclusively for Pakistan. While India's R&D focus has been on long-range missiles the focus of its production and deployment remains on Pakistan-specific systems. This is both because of its actual and perceived threats as well as technical limitations. Up until 2004-2005, the Pakistan-specific Prithvi-I was the only operational ballistic missile in India's arsenal (Geller, 2005, p. 96). Things have not changed drastically

since then. Pant and Joshi's (2018, pp. 165–166) work published in 2018 states that only Prithvi, Agni-I, and Agni-II had so far been inducted into India's nuclear forces; rest were still in the R&D stage. All three ballistic missiles possess ranges suitable mostly for targets inside Pakistan.

The U.S. also serves as a low-key rationale for India's strategic weapons programmes. India has historically sought to minimise the U.S. influence and interventions in South Asia and its desire to acquire an ICBM capability is, in part, driven by this goal (Arnett, 1998, pp. 11–12). Some writings on the Indian nuclear and missile programmes identify the threats issued by the U.S. against India during the 1971 Indo-Pakistan War as a rationale for India's quest for nuclear weapons and long-range nuclear delivery vehicles (Gavin, 2012, p. 118; Mehta, 2004, p. 187; Pillai, 2014, p. 4). There is some evidence that once the breakaway of East Pakistan (now Bangladesh) aided by India's military intervention in 1971 became an imminent reality the U.S. issued threats of nuclear use and naval intervention to dissuade India from aggressing against West Pakistan (present day Pakistan). In fact, Secretary of State Henry Kissinger believed that these threats succeeded in breaking the "India-Pakistan situation" (Gavin, 2012, p. 115).

India has also identified past U.S. pressures exerted both directly and indirectly through global non-proliferation regimes against its nuclear and missile programmes as discriminatory and has sought to continue these programmes as a symbol of defiance of the U.S. pressures. Improvements in the U.S.-India relations over the years, which has also paved way for Indo-U.S. nuclear cooperation, have vastly nullified this rationale but India's long-range missile developments, particularly of the 5000km range Agni-V and proposed ICBMs, are likely to serve as 'force in being' against the political and military interests of the U.S. on international level.

The above external security rationales are neither the sole nor the primary factors guiding the Indian decision-making. The internal-domestic dynamics have not only outweighed the external-strategic dynamics but have largely shaped them as well. In essence, vested organisational and domestic-political interests have been the key driving forces behind India's missile developments and for setting the stage for the nuclear and missile competition with both Pakistan and China. The organisational interests of the Indian scientific enclave

arguably are the paramount determinants of India's ballistic missile programme. In this regard, the design choices of Prithvi and Agni missiles were almost exclusively driven by DRDO's interests (Kampani, 2003, p. 57).

Although, the military was initially involved in conceptualising the IGMDP, its overall role in the programme was peripheral and it had been kept mostly out of loop on the developmental aspects (Mehta, 2004, pp. 178–179). Having historically been wary of the military the political leadership was likely content with military's limited involvement in the strategic weapons programmes (Mistry, 2003, p. 124). According to Ashok Mehta (2004, p. 179), the civilian view prior to 1998 nuclear tests was that scientists and engineers would be able to fire the weapon on their own.

In the end, missile developments were guided less by strategic considerations or military's requirements and more by what was attainable for DRDO (Banerjee, 2004). For instance, the decision to build Prithvi as a liquid-fuel missile was based not on the military's needs but on DRDO's past experiences and technologies acquired from the liquid-fuel Project Devil. Prithvi's Pakistan-specific characteristics were also not by a choice but by default owing to the state of technology, particularly its short-range. During the 1990s, DRDO's leadership displayed more confidence in the IAF's aircraft than Prithvi – their own product – as a nuclear weapons delivery vehicle (Perkovich, 1999, p. 248). Similarly, Agni resulted not from any strategic requirement but from "the motive to do something by utilising the available capability." (Perkovich, 1999, pp. 136 and 248).

For DRDO its missile programme has also been a redeeming factor in its national stature building, transforming the image of the organisation "from an institution that had a history of programme failures to one that, in the minds of many, epitomises organisational and technical excellence" (Kampani, 2003, p. 48). The image building capacity of the missile programme had not been limited to DRDO as an organisation but also extended to the scientists working within it. Dr Kalam emerged as a national figure and went on to become President of India in 2002 solely on his credentials and achievements as a missile scientist (Banerjee, 2004). The redemption achieved in the aftermath of IGMDP has allowed DRDO to insert itself as an important cog in the mechanism by which India seeks self-reliance in developing military and dual-use technologies. Within this mechanism it is not only able to

determine the design choices of the missile systems but also shape the political and strategic imperatives of the missile programme (Akhtar & Das, 2015).

also exercises significant clout with the Indian civilian policymakers. In the 1990s it successfully lobbied with the Prime Minister's Office, defence ministry, and civilian bureaucracy to strongarm the reluctant Indian Army into acquiring Prithvi-I despite the missile's design deficiencies (Kampani, 2003, p. 57). According to Frank O'Donnell and Harsh Pant (2014, p. 590), DRDO has direct access to the Prime Minister's Office and can advance its interests directly through that office rather than through any intermediary organisation that may cause bureaucratic hurdles for it. The two authors conclude that DRDO's conduct in the competitive bureaucratic/organisational context "can be seen as driven by an effort to protect valued communicative links to the prime minister, secure recurrent generous funding, and maintain a high level of autonomy."

Prestige factor is also a strong motivation for DRDO as it seeks to project its scientific prowess not just to the domestic audience but to the entire world and put India on the map amongst handful of states who have developed strategic weapons capabilities. The long-range missiles, such as Agni-V and propagated follow-on missiles with even longer ranges, are being pursued by DRDO to generate prestige as well as political capital, and budgetary sustainability for the organisation (O'Donnell & Pant, 2014, p. 594).

5.1.2. Pakistan's Response to Indian Ballistic Missile Programme

An editorial published in the Pakistani English newspaper *DAWN* after SLV-3 successfully placed Rohini in orbit expressed serious concerns over the political and military potential of India's technological achievement. It stated that the "main impulse for the development of rocketry has been the urge to acquire a delivery system for deadly weapons of destruction" and that the test of the four-stage solid-fuel rocket confirms that "India has an intermediate-range ballistic missile capability" ("An Indian Satellite," 1980). Outside of DAWN's editorial the reaction of the Pakistani state towards the advancements in Indian rocket programme was apathetic, even though security dynamics had profoundly changed with India's nuclear explosion in 1974 and development of ballistic missiles appeared a next logical step in India's strategic weapons programme.

Even as some members of India's strategic enclave publicly alluded to their aspirations for eventually developing ballistic missile systems the military led Pakistani government of the time does not appear to have laid out any plans of a practical value for a reciprocal development or counterbalancing Indian aspirations in any other way. Besides, space programme had not been Pakistan's top priority since the 1970s and long-range rockets with dual-use capacity were out of its league. Similarly, Pakistan appeared mostly unenthusiastic towards India's commencement of the IGMDP, even though the programme had more military value than SLV-3 did. Pakistani reactions have generally been slow to come. This is attributed to the country's early dismissive attitude towards Indian strategic and technological ambitions where Pakistan disdained them as 'prestige' oriented ventures that would not see the light of the day, that is until they did. According to Feroz Khan (2020), Pakistan perceived India as having a "delusion of grandeur about itself" and Pakistan was always ridiculing it, but when India eventually succeeded in its strategic weapons development "Pakistan struggled to get out of its shell."

As argued earlier, DRDO has had vested organisational interests in pursuing ballistic missile programme. Akhtar and Das (2015) explain that "the behaviour of DRDO with regard to missile testing and development of new weapons systems … may be in relation to their centrality in the project of national security, technological pride and prestige, etc. However, these have negative signalling effects on adversarial states like Pakistan which then feel compelled to respond." Thus, when India eventually flight-tested Prithvi in 1988 Pakistan hastily sought to bring back balance to the *status quo*. Pakistan's first instinct was to reciprocate to India's development and flight-test of Prithvi by flight-testing ballistic missiles of its own.

According to A.Q. Khan, there were plans to commence a missile programme in 1981, two years ahead of India's IGMDP, but then military ruler of Pakistan General Zia Ul Haq did not allow the programme to be started as Pakistan was engaged in the Afghan War (*Pakistan: Dr Abdul Qadeer Khan Discusses Nuclear Program in TV Talk Show*, 2009). While General Zia did restrain some aspects of Pakistan's nuclear programme during the Soviet-Afghan War to facilitate cooperation with the U.S. it is not known if he indeed halted the plans for commencing ballistic missile programme or that any such plans existed to begin with.

According to Feroz Khan (2020), efforts to develop ballistic missiles may have started in 1986-1987, which would put programme's initiation ahead of the first flight-test of Prithvi. As recalled *Chapter 3*, The New York Times report by Bernard E. Trainor (1988) on 24th May 1988 and the Washington Post report by David B. Ottaway (1988) on 26th May 1988 stated that Pakistan had carried out flight-tests of two SRBMs. The alleged missile flight-tests in May 1988 in all likeliness did not take place but the fact that the two reports cited missile specifications that would later be found on Pakistan's first two ballistic missiles, Hatf-I (80km) and Hatf-II (300km) SRBMs, almost to the pinpoint accuracy may suggest that the missile programme had been underway for a while. If indeed this was the case, then a major challenge here is in ascertaining if the Pakistani programme was undertaken in response to or independent of India's missile programme.

Whatever the year of Pakistani programme's inception, the ongoing R&D into the missiles appears to have been accelerated after Prithvi's first flight-test and the resultant Hatf-I and Hatf-II were flight-tested only a year later in February 1989. Given Pakistan's mediocre technical base in rocketry and the tightening grip of the non-proliferation regimes, particularly of the MTCR, Pakistan's missile development efforts were severely constrained and both missiles came out as a lacklustre and rudimentary systems. Contrary to the popular perception of the time these missiles were not nuclear capable and given the fact that they lacked one of the most crucial components, the guidance system, their utility in conventional role was also severely constrained. Thus, both missiles had a limited military utility.

While the first generation Prithvi-I was also an inchoate system, based on the technologies from 1950s and 1960s, the programme was significantly more ambitious in terms of funding and research compared to the Pakistani programme (F. H. Khan, 2020). India was also in the process of developing a working guidance system and planned to subsequently operationalise the missile. Pakistan's lack of strategic depth also recompensed Prithvi-I's design deficiencies and short-range, enabling it to target some of Pakistan's major cities, including the capital Islamabad. The cursory manner of Pakistan's development of the two Hatf missiles, their rushed flight-tests, and their deficient military utility does not suggest that they were intended to serve as a rational response to perceived threats from India's Prithvi programme.

Instead, the development of these missiles and their flight-tests in 1989 appear to have been prompted by factors such as 'national prestige' and desire to catch up with India for maintaining regional relevancy much as India had sought to catch up with China and create an extra-regional or international relevancy for itself through its missile programme. Another explanation for the development of the two missiles is the organisational impetus for weapons indigenisation created by the formation of the Combat Development (CD) Directorate within the Pakistan Army's General Headquarters (GHQ), which sought to facilitate weapons R&D and indigenisation in Pakistan.

When India tested Agni-TD in May 1989 Pakistan did not reciprocate with a missile flight-test. General Aslam Beg (2021, p. 196), identified Agni as a 2500km range missile that was 'no threat' to Pakistan "because it will fall on targets outside Pakistan." Pakistan shifted its response to Agni by opting to politically overplay the implications of its development as a major detriment for regional and international security. On 23rd May 1989, Pakistani foreign minister Sahabzada Yaqub Khan echoed this apprehension in the Senate of Pakistan saying that the firing of Agni missile by India was a matter of grave concern for Pakistan because it posed a direct threat to regional security and international peace (Mirza, 2009, p. 380).

On 20th October, Prime Minister Benazir Bhutto speaking in a press conference in Kuala Lumpur also expressed her concerns on Agni missile and called for a dialogue on arms control (Mirza, 2009, p. 385). Pakistan's rhetoric did not gain much attention from the international community, in particular the U.S. Instead, pressure began to mount on Pakistan itself to show restraint. In 1993, Pakistan changed its tactics for reining in the Indian missile programme by proposing 'Zero Missile Regime' for South Asia, which India rejected.

Suffice to say, India's development of first generation Prithvi-I and Agni-TD did not immediately compel Pakistan to seek out more sophisticated ballistic missile systems that could be utilised in both conventional and nuclear role, as it would later do in the case of missiles from the dual-track approach. Instead, Hatf-II disappeared immediately after its first flight-test and some thirteen years later its designation was assigned to a different missile known as Abdali (i.e., Hatf-II Abdali). The Hatf-I programme continued but the missile did not resurface until 2000 when an improved version Hatf-IA with 100km range was flight-tested. No further flight-tests of this missile have been demonstrated since then, however. The

alleged 600km indigenous Hatf-III that was under development since 1987 never made an appearance. The disappearances of the first two Hatf missiles and nonappearance of the third one further play into the hypothesis that they were neither able nor were intended for performing as a rational response and a credible deterrent against Indian missile programme.

For a period, the air-deliverable nuclear bomb programme took precedence over the missile programme. Compared to Hatf-I and II, PAF's aircraft were not only believed to be able to carry nuclear bombs but also offered longer-range. In particular, the American built F-16s offered more credible, cost-effective, and readily available means of nuclear weapons delivery. Thus, from 1988 to 1995 Pakistan began perfecting the air-deliverable nuclear bombs and aircraft manoeuvres for dropping them (M. Ahmed, 2012, p. 301; F. H. Khan, 2012, p. 187). Pakistan's decision to focus on aircraft option may have also stemmed from the fact that up until its 1998 nuclear weapons tests India too was almost exclusively reliant on aircraft for a nuclear strike mission (Mehta, 2004). Given Prithvi's short-range and safety and readiness issues associated with its liquid-fuel propellant the Indian strategic planners deemed IAF's combat aircraft as more cost-effective and reliable means for delivering nuclear weapons (Perkovich, 1999, pp. 248–249).

In 1990, as the Afghan-Soviet War began to drawdown the U.S. decided to cut the cord on its military assistance to Pakistan citing the recommencement of the highly enriched uranium (HEU) production by the country as the reason. The sanctions imposed under the infamous Pakistan-specific Pressler Amendment resulted in the U.S. withholding the supply of F-16s that Pakistan had already paid for and withdrawal of logistical support for the ones already in service. At the time, F-16s were not only crucial components of Pakistan's conventional forces but also an operational nuclear weapons delivery vehicle. The U.S. decision to withhold F-16 sales and support from Pakistan dealt a major blow to the military forces balance in South Asia, especially between PAF and IAF as the latter continued acquire of state-of-the-art combat aircraft such as Mirage 2000 from France and MiG-29 and later Su-30MKI from Russia. As a corrective measure Pakistan suddenly found ballistic missiles to be attractive alternatives.

5.1.2.1. Dual-Track Ballistic Missile Acquisition

The military imbalance created by the loss of the U.S. military assistance, in particular F-16s sales and support, prompted Pakistan to seek assistance from China. Sometime in 1991 the two countries concluded an agreement whereby China was to promptly supply Pakistan with its latest solid-fuel M-11 SRBM and later with M-9 SRBM and their complete transfer of technology (TOT). The TOT of the Chinese missiles put Pakistan on the path to establish more sophisticated technical base and templates for the indigenous development of advance solid-fuel ballistic missile. In 1993, Pakistan further negotiated with North Korea for the purchase of its liquid-fuel No-dong and its TOT. This missile would serve as the template for its indigenous liquid-fuel missile development. By acquiring these missile systems and their TOT Pakistan fundamentally restarted its ballistic missile programme from the scratch and gradually scrapped the indigenously designed Hatf-I, Hatf-II (original), and Hatf-III ballistic missiles.

Both the Chinese and North Korean missiles were, however, only conventionally armed in their original forms. But correspondingly Pakistan's objective in acquiring these missiles in the pre-nuclearised South Asia had been, in the first instance, to consolidate its conventional warfighting capacity and capability, especially in the area of airpower and deep penetration strike capability associated with it, which had decisively titled in India's favour after the withdrawal of F-16 sales and support by the U.S. (Karamat, 2004). On the other hand, details provided by Feroz Khan (2020), suggest that Pakistan also had a long-term plan for developing more sophisticated and long-range spinoffs of these missiles that would cover India in its entirety. This objective was reaffirmed by General Musharraf sometime after South Asia's overt nuclearization in 1998 (Tertrais, 2012). Since long-range ballistic missiles are generally deemed viable only if they are dual-use or nuclear capable the Pakistani dual-track missiles can be reckoned to have had premeditated nuclear underpinnings from the start. This, however, required Pakistan to invest in extensive revamping of the Chinese and North Korean missile systems to develop indigenous variants with dual-use capability.

Indian missile programme creeped to progress in the 1990s. The second and third flight-tests of Agni in 1992 and 1994, and Prithvi's relocation to the town of Jalandhar near Pakistani border in 1997, however, did not entice Pakistan into revealing its new Chinese

origin missile systems in reciprocation. Although, a flight-test of an indigenous 600km Hatf-III reportedly took place in response to Prithvi's flight-tests this was not the case. It should also be considered that some scholars suggest that by 1997 Pakistan had acquired the manufacturing capability of M-11 (Mehta, 2004, p. 182). However, no flight-test of the missile was reported during the period. Pakistan's reluctance to flight-test the Chinese missiles at the time had little to do with any desire for avoiding regional arms race and more to do with political constraints imposed by external factors. At least two important external political factors discouraged Pakistan from flight-testing missile systems.

First, Pakistan wanted to avoid triggering the MTCR related sanctions both for itself and China (F. H. Khan et al., 2004). This was likely at the behest of China, which was in the process of improving ties with the U.S. and wanted to roll back the backlash for its past missile proliferation activities. However, despite both China and Pakistan denying missile cooperation and Pakistan keeping the supplied missiles under wraps the Chinese firms suspected of being involved with the Pakistani missile programme were sanctioned in 1991 and 1993.

Second, Pakistan was under immense pressure from the U.S. to exercise "self-restraint" in missile testing and operationalising (F. H. Khan, 2004, p. 82). For a period, Pakistan ceded to the U.S. pressure and desisted from flight-testing the newly acquired M-series missiles, although the R&D efforts to indigenise these missiles continued. Additionally, Pakistan was trying to have the Pressler Amendment sanctions rolled back. Missile flight-tests, particularly that of foreign origins, could have jeopardised its efforts.

When Pakistan began receiving the complete No-dong missiles as well as their assembly kits between 1996-1997 it did not find the same strings attached to this North Korean missile as it did with the Chinese. Even though relations with the U.S. had received a slight uplift in the shape of Brown Amendment, which allowed Pakistan to receive military equipment it had bought from the U.S. prior to the invocation of Pressler Amendment, the U.S. failed to deliver the desperately needed F-16s. Pakistan began planning a flight-test of a No-dong clone in the first week of March 1998 and hoped to display it in the annual "Pakistan Day" military parade on 23rd March (F. H. Khan, 2020).

The missile's flight-test preparation came when the Pakistan-hostile BJP government in India was seeking an excuse for recommencing Agni programme, recommence Prithvi's deployment, and bring India out of nuclear opacity. In view of the BJP's hawkish stance, the U.S. Secretary of State Madeleine Albright wrote a letter to Pakistan's Prime Minister Nawaz Sharif on 20th March, urging him to postpone any missile tests until after the new Indian government had time to settle into office and, hopefully, renew dialogue with Pakistan (Perkovich, 1999, pp. 409–410). Feroz Khan (2012, p. 267, 2020), has corroborated the accounts of Albright's letter. According to Khan, Pakistan decided to cooperate with the U.S. and postponed the flight-test.

On 6th April 1998, in a sudden policy shift, Pakistan conducted the first flight-test of the liquid-fuel Hatf-V Ghauri. The missile flew 700km, but Pakistani authorities indicated it had a maximum range of 1500km. According to Perkovich (1999, p. 410), Secretary Albright did not appreciate the Pakistani "bellicose response." Pakistani authorities had indeed developed misgivings towards the U.S. over its failure to rollback Pressler Amendment sanctions and lopsided treatment of Pakistan in comparison with India over the missile programme, but the decision to flight-test Ghauri had little to do with giving the U.S. a bellicose response. At least, three considerations dominated Pakistan's decision to go ahead with Ghauri's flight-test.

First, India's deployment of Prithvi in the town of Jalandhar near Pakistani border in 1997 had been worrisome for Pakistan but had gone unchallenged. Deterring such future deployments through 'equalizing capabilities' was deemed necessary. In this sense, Ghauri was counterpoised against Prithvi both as an equalizing military capability – although it had an exponentially longer-range – and symbolically as it was named after Shahabuddin Ghauri, a medieval Muslim ruler who had decisively defeated Hindu ruler Prithviraj Chauhan, the eponymous of Prithvi missile (N. A. Salik, 2009, p. 210).

Second, Pakistan had developed a genuine security concern about the BJP's pledges to 'induct nuclear weapons' and 'forcefully take Pakistani part of Kashmir.' Pakistani planners did not see the BJP's election manifestos of 1996 and 1998 as mere rhetoric but as its intention. The nuclear and missile programmes were seen as a last-resort protection by

Pakistan and Ghauri was flight-tested as a proactive reply to what was possibly being deemed as an eventuality (Perkovich, 1999, p. 411; N. A. Salik, 2009, p. 210).

Third, and perhaps the most overriding reason of all, was the persistent wheedling of overzealous AQ Khan who, perhaps finding the situation opportune, wanted to flight-test Ghauri to serve his personal and organisational agenda (F. H. Khan, 2012, pp. 267–268, 2020). In testing the missile, Khan was not only symbolically positioning himself and his organisation (KRL) as a bulwark against India's nuclear and missile programme but was also competing at home with his rival PAEC/NDC's solid-fuel missile programme. Khan was involved in a bitter race to develop and flight-test what the winner could then claim to be Pakistan's "first nuclear capable ballistic missile." AQ Khan had already successfully marketed himself as the father of Pakistan's nuclear weapons programme and possibly wanted the same title for the missile programme as well.

Unbeknownst to external observers, Ghauri's first flight-test was a complete failure. The missile's RV was never found. Feroz Khan and Naeem Salik, in their interviews with the researcher, suggested that the RV most likely burned up and disintegrated upon re-entry. Ghauri was marred by plethora of issues like inadequate heat-shielding, poor guidance system, and multiple telemetric problems, which rendered it inoperable. Lacking intelligence and technical means to detect the test preparations, the outcome of the test or determine the origin of the missile, India was caught surprised by Ghauri's flight-test. According to Perkovich (1999, p. 410), the lack of intelligence on the test and the general Indian contempt for Pakistan's technical capabilities caused some in India to assert that the test was a hoax and others to argue that Pakistan must have obtained the missile from China.

The U.S.' suggestion that the missile was North Korean only flared contempt amongst Indian thinkers that the U.S. was covering up for China. As stated earlier, the Sino-Pakistan nuclear and missile cooperation had been a keystone but an addendum security rationale for India's own nuclear and missile programme. But even if Ghauri was not of Chinese origin, it mattered little. Rationalising the missile's test as a security threat India conducted five nuclear tests under the rubric of Pokhran-II between 11th-13th May 1998.

Many scholars find weak causal relationship between Ghauri's flight-test and India's decision to conduct nuclear tests. In his interview, Feroz Khan dismissed the notion that a missile flight-test could rationalise a nuclear weapons test. Pakistan's nuclear and missile ambitions and external support involved in them had been well known to India for years but did not cause the past governments to conduct nuclear test. Scholars instead find explanation for India's decision to test nuclear weapons and subsequently accelerate its ballistic missile programme in the shifts in its domestic structure, particularly organisation/bureaucratic and national and nationalistic politics, in the late 1990s.

The Indian scientific enclave had been pushing for nuclear tests for some time but were impeded by successive Indian governments until the BJP's coming to power. The BJP's coming to power subsequently paved way for the tests to go ahead. Late Pakistani political scientists, academic and activist Eqbal Ahmad tried making sense of BJP's decision to test in following words:

> "… the only way you can explain India's decision is this particular brand of Hindu nationalism the BJP represents. The BJP's notion of power is military power. It believes influence is attained by force or the show of force. I am not sure that considerations of Pakistan played any role at all in their decision to test nuclear weapons. I think they were testing to become equals of the other nuclear powers. They tested in the expectation of joining this silly abstraction called the *nuclear club* …" (Barsamian, 2016, p. 70).

Similarly, Paul Williams (2011, p. 19), in his analysis of the BJP's nationalism and decision to develop nuclear weapons states, "nuclear weapons were a bold and highly visible way for India's right-wing BJP government to signify national power and independence from other nations" and "the successful achievement of Indian modernity and the realisation of its politically autonomous nationhood are projected through the act of emulating existing nuclear powers, some of which were the former European empires from which Hindu nationalism sought to distance India."

Many have highlighted that the BJP had decided to test nuclear devices well ahead of Ghauri's flight-test by Pakistan, of which it had been unaware. According to Bajpai (2009, p.

107), the decision had already been set in motion from the day the BJP had come to the office. Therefore, it "had little to do with Pakistani behaviour in and around the tests" and that the "the Pakistani missile test was an "excuse," not the cause." Langewiesche (2007, p. 122), states that Ghauri's flight-test does not seem to have played heavily into the Indian decision to test nuclear weapons. The physical preparations had been under way for a month, and the decision to proceed was made for domestic political reasons by the insecure leaders of the governing Hindu nationalist BJP, who wanted to impress the masses with their strength. Rajain (2005, p. 223), Narang (2014, p. 98), and Salik (2019a, p. 51), point out that the BJP had ordered nuclear test preparation as far back as 1996 during their 13 days rule, which further de-links Ghauri as a causal phenomenon from India's decision to test nuclear weapons.

India's nuclear tests, however, did "cause" Pakistan's nuclear and missile programmes to step out of opacity. On 28th May, in a demonstration of one-upmanship, Pakistan responded with six nuclear tests of its own. Between 1989 and 1997 the Pakistani missile programme had remained cautiously mute but with the overt nuclearization Pakistan, much like India, began ramping up its missile development with a specific objective of giving credence to its nuclear deterrence. The conventional aspect of the programme was rendered of secondary value. Nuclearised South Asia saw a doctrinal shift from aircraft delivery option to ballistic missiles in both Pakistan and India (Mehta, 2004). In essence, the supposed missile competition or race in South Asia began only after India's decision to test and Pakistan's decision to follow suit.

5.1.2.2. Post-Nuclearization Missile Development: 1998-2004

Immediately after their nuclear tests both Pakistan and India unilaterally pledged moratoriums on further nuclear testing but both refused to issue similar pledges on their respective missile developments. With nuclear tests capped for unforeseeable future and given their shared disinclination towards transparency on other matters of their respective nuclear programmes – such as expenditure, fissile material production, warhead designs, etc – the dual-use ballistic missile programmes of the two countries became the most visible components of the nuclear arms race in South Asia. Post-nuclearised South Asia has seen Pakistan rapidly advance its ballistic missile programme. What, however, remains an intrigue

from the arms race perspective is whether these developments have come in 'reaction' to the corresponding missile developments in India or independent of them? Based on the patterns of ballistic missile flight-tests in South Asia, several scholars are convinced that a competitive action-reaction relationship has existed between Indian and Pakistani missile programmes.

When India flight-tested Agni-II on 11th April 1999, Pakistan followed up with the second flight-test of a reportedly improved Ghauri on 14th April and on 15th April Pakistan flight-tested the 700km solid-fuel Hatf-IV Shaheen-I, a derivative of the Chinese M-9 SRBM. At first glance Pakistan's flight-testing behaviour suggests prevalence of an *action-reaction* syndrome with an element of one-upmanship, much as it was in the case of nuclear tests. Ghauri's second flight-test counterpoised it against Agni-II as part of an ostensible long-range missile contest. Whereas Shaheen possibly represented a competition in the solid-fuel missile development. Although officially declared as successful Ghauri's second flight-test was also a failure as the RV once again disappeared (N. A. Salik, 2020). Much as before this failure too went unnoticed.

Shaheen's maiden flight-test, on the other hand, was relatively successful and, according to Feroz Khan (2020), had far more profound impact on the Indians. The greater safety and readiness features associated with the solid-fuel propellant made Shaheen significantly more reliable and credible nuclear delivery vehicle for targeting India's strategic locations that fell within its range. In comparison to liquid-fuel Ghauri, which needed to be fuelled at the pre-designated launch site prior to its launch, thus consuming precious time and rendering it vulnerable to detection and destruction by India, Shaheen could be maintained pre-fuelled, easily relocated to pre-designated launch site, and be launched on demand.

Missile development and flight-tests in South Asia intensified during post-nuclearization military conflict and crisis events as both Pakistan and India conducted back-to-back flight-tests, and in some cases also 'allegedly' activated nuclear capable ballistic missiles against each other as means of nuclear signalling. For instance, the limited scale but violent Kargil Conflict of 1999 was fervent with reports of Pakistan activating its nuclear capable ballistic missiles and India responding in similar fashion (Chengappa, 2000, p. 437). While the U.S. presidential advisors and policy practitioners of the time, including Bruce

Riedel (2009, p. 139) and Strobe Talbott (2004, p. 167), propagated reports that the conflict had taken on a nuclear angle with Pakistan rolling out is ballistic missiles, key Pakistani and Indian planners of the time dismissed these reports (Chari et al., 2007, p. 136).

During 2001-2002 Military Standoff along the international border both countries issued nuclear threats and backed them up with provocative flight-tests of both old and new ballistic missiles as means of deterrence signalling with the underlying message being that they had the political will and military means to escalate a crisis, even up to the level of nuclear war (Chari et al., 2007, p. 174). On 25th January 2002, India conducted the flight-test of 700km range Agni-I. On 25th May Pakistan flight-tested Ghauri MRBM and on 26th Pakistan debuted the new solid-fuel Ghaznavi SRBM. On 28th Pakistan flight-tested the 180km solid-fuel Abdali SRBM, which had replaced the original Hatf-II. Many scholars argue that the missile flight-tests during the crisis by Pakistan were motivated by the ongoing competition. However, the gap in the timings of the two countries' missile flight-tests indicates that Pakistan was not immediately compelled to reciprocate to Indian missile flight-test, thus rendering the competitive or tit-for-tat missile flight-test argument uncertain. The Kargil Conflict and 2001-2002 Military Standoff, and the tests conducted during the Standoff, are subject to in-depth discussion and analysis in *Chapter 6*.

On 9th March, Pakistan conducted the first flight-test of 2200km-2500km two-stage Shaheen-II MRBM. The range characteristics and the timing of Shaheen-II's flight-test did not establish any correspondence with the missile developments and flight-tests by India. The missile's development was significant at least for two reasons. *First*, it provided Pakistan with the capability to target mainland India in its entirety, including parts that Ghauri was not able to reach. Second, it signalled that the solid-fuel missile programme, particularly Shaheen series, had taken precedence over the liquid-fuel Ghauri programme.

The long-range variants of Ghauri – such as Ghauri-II and Ghauri III – that were being widely predicted by experts failed to make their appearance. As clarified by General (R) Kidwai these missiles were proposed by A.Q. Khan but no practical measures for developing them were ever taken. At least three tests of the original Ghauri were conducted in 2004 but subsequent flight-tests of the missile began thinning out. Shaheen-II's development also indicated that Pakistan had surmounted the original designs of the Chinese of M-9 and M-11

missiles both in terms of capability and range. Although, some experts believe that Pakistan may have acquired M-18 MRBM from China for the missile's development. Unlike M-11 and M-9 not only there is no evidence of M-18 transfer to Pakistan but the existence of the missile itself remains murky.

5.2. United States: The Causal Trigger

Pakistan appears not to have concerned itself with the military implications of India's IGMDP throughout its conception and R&D phase. Pakistan's subsequent hasty response to advancements in India's missile programme in the shape of Hatf-I and Hatf-II flight-tests also appears primarily an effort to maintain political and prestige parity with India and these missiles appear to be merely experimental. Four subsequent events, however, made Pakistan realise both the dangers posed by ballistic missiles and advantages of having such a weapon system.

First, Pakistan witnessed the War of Cities between Iraq and Iran where Iraq launched ballistic missile attacks against Iran. The efficacy of ballistic missiles in conventional role and its ability to penetrate enemy's air defences made it an attractive weapon system (N. A. Salik, 2020).

Second, during the Soviet-Afghan War Pakistan experienced the menace of ballistic missiles first-hand as pro-Soviet Afghan forces launched dozens of Scud ballistic missiles inside Pakistani tribal areas (N. A. Salik, 2002a, 2020).

Third, During the 1991 Gulf War, Pakistan's Chief of Army Staff (COAS) General Aslam Beg was visiting Pakistani troops stationed in Saudi Arabia when Iraq launched seven ballistic missiles against that country. The American supplied Patriot ABM system was only able to intercept three of the Iraqi missiles. This served to reinforce the importance of ballistic missiles for Pakistan (Beg, 2021, p. 229).

Fourth event was the U.S. military and economic sanctions imposed on Pakistan as the Soviet invasion of Afghanistan began to fold. This resulted in the U.S. withholding the coveted F-16 fighter aircraft from Pakistan. Together with the previous three events, Pakistan realised

that ballistic missiles could serve as effective alternatives to aircraft for 'deep penetration strikes.'

While the first three events instilled appreciation in Pakistan for the implications as well as advantages of ballistic missiles it was the fourth event that triggered Pakistan's quest for acquiring more sophisticated ballistic missiles, resulting in the acquisition of solid and liquid-fuel ballistic missiles from China and North Korea respectively, and effectively initiating its dual-track ballistic missile programme. The key realisation in this research is Pakistan's requirement for the U.S. origin 'deep penetration strike capability,' loss of which explains the dual-track ballistic missile acquisition as a substitute.

5.2.1. Quest for A Deep Penetration Strike Aircraft & The U.S.-Pakistan Non-Proliferation Tussle

In the aftermath of 1971 war with India Pakistan sought to modernise and reequip PAF. Though PAF had acquired number of French Mirage-III aircraft and was in the process of inducting Shenyang F-6, a licensed Soviet MiG-19 built by China, it still had a requirement for a more advance combat aircraft to replace or augment its legacy platforms of the U.S. origin. PAF had a long history of operating and employing the U.S. origin aircraft like B-57 Canberra, F-86 Sabres and F-104 Starfighters in wars against India in 1965 and 1971. The efficacy of these aircraft and the performance of the U.S. trained Pakistani pilots left a lasting mark on both Pakistan and India. Not only had the IAF failed to completely wipe out the relatively smaller PAF in the two wars but had instead been outperformed by it. However, these aircraft were now quickly becoming obsolete, and it was only logical for PAF to consider another U.S. origin aircraft as their replacement.

In 1974, Bhutto successfully pursued Ford Administration to lift military sanctions on Pakistan that had been placed on it in the wake of 1965 war with India. This opened doors for Pakistan to evaluate two aircraft: Northrop F-5E Tiger II and A-7 Corsair II. Pakistan eventually short-listed A-7 and sought a deal with the U.S. to procure 110 used aircraft worth $500 million. Pakistan's choice of A-7 over F-5 was curious. The latter was supersonic aircraft developed for the United States Air Force (USAF) and was popular with countries like Turkey, Saudi Arabia and Iran that were allied with Pakistan. On the other hand, A-7 was subsonic

carrier-based attack or deep penetration strike aircraft (DPSA) designed for and at the time operated exclusively by the United States Navy (USN).

However, as a DPSA the A-7 not only offered improved precision strike capability but during its service it had been widely used for training pilots in nuclear weapons delivery tactics (*Completed A-7 Corsair II*, n.d.). Pakistani scientists had commenced theoretical studies into the nuclear weapons development in the early 1970s (F. H. Khan, 2012, p. 175). Whether there was any assessment by the government and PAF that considered DPSA, particularly the A-7, as a potential candidate for training Pakistani pilots for nuclear bomb delivery and for using the aircraft as a nuclear weapons delivery vehicle is unknown. The U.S., however, does not appear to have had any suspicions in this regard and PAF's interest for acquiring A-7 appear primarily to employ it in an attack role against Indian military's ground assets such as its armour/tanks in case of another war.

During the period, however, Bhutto had already begun publicizing his intent for developing nuclear weapons capability. The target audience for Bhutto's 'nuclear power' publicity campaign was mostly domestic, but the U.S. was also keenly listening in. In 1973, Pakistan had started negotiations with France for the purchase of nuclear reprocessing plant and in March 1976 the two countries signed an agreement to the effect (Z. A. Bhutto, 1979, p. 164). Pakistan maintained that the reprocessing plant was for energy production. The U.S., however, believed that the plant could enable Pakistan to pursue a plutonium route for developing nuclear weapons. Whatever the case may have been, Pakistan's nuclear ambitions, particularly the Pakistan-France reprocessing plant deal, became a major hurdle for the potential deal on A-7 and other weapons between the two countries.

The U.S. stipulated that Pakistan should give up the French reprocessing plant if it wanted to acquire A-7 but found Bhutto unyielding. To gain some leverage with Bhutto the U.S. turned to Shah of Iran, Muhammad Reza Pahlavi, who maintained a close friendship with Bhutto. Outside of Pakistan, Shah probably understood Pakistan's military needs better than anyone else at the time. Not only was he an air power aficionado keen on modernising Imperial Iranian Air Force but had also been involved in the strengthening PAF during and after Pakistan's war with India in 1965. During the war he had extended Iranian airbases to PAF to deploy its aircraft away from Indian air strikes. In 1967, he rescued PAF's dwindling

number of F-86 Sabres by acquiring several Canadian built units of the aircraft and its spare parts from West Germany on Pakistan's behalf. By doing this the Shah helped Pakistan bypass the U.S. military sanctions imposed in the wake of 1965 war (Vatanka, 2015, pp. 49–50, 72).

Shah's statement to the U.S. officials that "Pakistan has no air force to speak of," in response to their request to convince Bhutto to give up on the French deal, essentially summarised PAF's predicament (M. M. Craig, 2017, p. 67). He personally believed that the A-7 were best suited for Pakistan's need to deal with its "two-border problem" (Discussions with the Shah of Iran and PM Bhutto During the Shah's Visit to Pakistan, 1976). This perhaps was about rising belligerency from both India and Afghanistan towards Pakistan during that period. It was Shah's conviction that the U.S. would find Bhutto very receptive and cooperative on relinquishing the French reprocessing plant deal if he is given assurance that the U.S. Congress would be recommended to approve the sale of A-7 and other military transfers as well as economic assistance to Pakistan. While Shah advocated PAF's case he simultaneously disapproved of Bhutto's nuclear ambitions, possibly because he himself harboured similar aspirations for Iran. If Pakistan continued with its nuclear ambitions, it would not just overshadow Iran in the region but also invite unwelcome attention to Iran's own nuclear activities. Thus, when he had held discussions with Bhutto, he tried to convince him that Pakistan would be better off strengthening its armed forces on "non-atomic capabilities" and to not contemplate a reprocessing plant.

In August 1976, the U.S. Secretary of State Henry Kissinger travelled to Pakistan. During his meeting with Bhutto, he essentially proposed what the Shah had recommended. He offered Bhutto 100 A-7 in exchange for dropping the French reprocessing plant deal. Bhutto, however, deemed the proposal unacceptable and thus rejected it. The U.S. retaliated by suspending all economic and military assistance to Pakistan (Vatanka, 2015, p. 121). In 1965, Bhutto had famously stated that "if India builds the bomb, we will eat grass or leaves; even go hungry, but we will get one of our own." India had tested its first nuclear explosive device in 1974 and Bhutto now appeared more than willing to live up to his words.

1976 was also an election year in the U.S. with the incumbent Republican president Gerald Ford contesting against the Democrat nominee Jimmy Carter. According to Bhutto, sometime after their August 1976 meeting, Kissinger had warned the Pakistani ambassador

in Washington that if the Democrats won the election in the United States, they would make 'a horrible example of Pakistan' if Pakistan acquired the nuclear reprocessing plant. Kissinger asserted that Carter was determined not to allow any further proliferation of nuclear weapons (Wolpert, 1993, p. 380). Carter won the elections and took over the presidency in January 1977.

Carter soon embarked on a diplomatic mission to convince both Pakistan and France to opt out of the reprocessing deal. He first offered Bhutto 'trade-offs' deal of conventional military hardware in exchange for Pakistan giving up on the French deal. Carter, however, was personally against selling A-7 to Pakistan believing that the sale of the aircraft would upset India and start arms race in South Asia, overlooking the fact that India on its part had begun searching for a DPSA platform in 1972, two years ahead of Pakistan. In place of A-7 Carter pondered on selling an older defensive model of the naval A-5 Vigilante bomber that were nearly obsolete (Hobbs, 2014). The watered-down deal that Carter offered was unacceptable to Bhutto. In June 1977 Carter killed off Pentagon's recommendation for selling 110 A-7 to Pakistan (Vatanka, 2015, p. 122).

Pakistan-U.S. relations only got more complicated when Bhutto was deposed in a coup d'état led by COAS General Zia Ul Haq on 5th July 1977. In September the U.S. State Department's nuclear specialist Joseph Nye equipped only with a 'stick' of threat of sanctions under Glenn Amendment tried to convince General Zia to drop the French deal. The Symington (1976) and Glenn (1977) Amendments called for a ban on the U.S. economic, and military assistance, and export credits to countries that had not placed all nuclear facilities and materials under the inspection regime of the International Atomic Energy Commission (IAEA), and that deliver or received, acquired, or transferred nuclear enrichment (Symington) and reprocessing (Glenn) technologies. Glenn Amendment further called for sanctions on countries that exploded or transferred a nuclear device (Cronin et al., 2005). When Zia refused sanctions were invoked against Pakistan under the Glen Amendment (Haass, 1998, p. 159).

While imprisoned, Bhutto (1979, p. 164), wrote that the reprocessing plant had received confirmation from the 'International Atomic Energy Commission' and that the U.S. representatives on the 'Commission' had voted in favour of the confirmation. Carter had more success with the French President Valéry Giscard d'Estaing, who agreed to revise the

agreement with Pakistan. He first proposed “co-processing” fuel with Pakistan that could only be used for power generation and not contribute toward bomb-making but later in June 1978 he decided to put an end to the contract with Pakistan altogether (Haass, 1998, p. 159). In April 1979, Carter invoked the Symington Amendment related sanctions against Pakistan as well after it was discovered that the country had a clandestine uranium enrichment facility located in Kahuta, near Islamabad (Wirsing, 1991, p. 9).

With A-7 deal now dead and embargoed with the U.S. sanctions Pakistan was left looking at widening conventional disparity, especially in airpower, against India. In 1978, India’s search for a DPSA platform had ended with the purchase of Anglo-French SEPECAT Jaguar. In 1979, India began preliminary negotiations with France for next generation Mirage-2000 multirole fighter jet while Pakistan remained under the U.S. arms embargo (Wirsing, 1985). Pakistan too on separate occasions considered both the Jaguar and Mirage-2000 but in the end found the aircraft unaffordable as the British and French were not keen on extending similar credit-based sales as the U.S. was known for (M. M. Craig, 2017, p. 84; “Pakistan Evaluates Fighters,” 1981; Siddiqa, 2001, p. 140).

As India was modernising its air force Pakistan’s regional security realities had also begun to change to its detriment. In 1978, Muhammad Reza Pahlavi went into self-exile and Iran’s new leader, Ayatollah Khomeini, emerged ideologically opposite to Zia’s views. More importantly, Afghanistan, Pakistan’s other belligerent neighbour, was going through a political upheaval that threatened Pakistan’s security as well. In 1978, Pro-Soviet People's Democratic Party of Afghanistan (PDPA) ousted the Afghan president Mohammed Daoud Khan. In 1979, PDPA invited the Soviet military to supress anti-communist unrest in Afghanistan. Thus, began Soviet ‘intervention’ in or ‘invasion’ of Afghanistan.

Pakistan was now facing a possibility of a two-front conflict. Relations with India, communist regime in Afghanistan, and the Soviet Union were sour. However, Soviet presence in Afghanistan immediately became a turning point in the Pakistan-U.S. relations. In a run-up to the arrival of Soviet forces in Afghanistan, Carter Administration had already began softening its policies towards Pakistan. According to Malcom Craig (2017, p. 10), by mid-1979 the U.S. policy had shifted from preventing Pakistan from acquiring nuclear weapons capability to making sure it did not carry out a nuclear test. Pakistan was, however, some

years from having a nuclear explosive device. It is not known why the Administration would conclude that Pakistan could have a nuclear device at that point in time. One explanation could be the CIA's 1975 secret memorandum that estimated that Pakistan could produce a nuclear device as early as 1978. Salik (2017, p. 42), points out that there was no technical ground for this estimation and that it could have been based on Bhutto's statement from 1974 that he 'had completed a plan, which would produce a nuclear device in four years.'

The Iranian Revolution and the Soviet military presence in Afghanistan served to hasten Carter Administration to further soften its policies on Pakistan. Carter could ill afford to lose Pakistan to the rising anti-Americanism that was taking place both in the country and the region, and he also needed the country's cooperation in Afghanistan. While Pakistan perceived the Soviet presence in Afghanistan as threatening it was nonetheless wary of the U.S.' support given the temporary nature of its past assistances. Realising the excessively personal [presidential] nature of Pakistan's past association with the U.S., Zia sought a formal treaty ratified by Congress (Tahir-Kheli, 1982, p. 101; Wirsing, 1985, p. 278). In the end, however, he settled for presidential reaffirmation on resumption of assistance. During his 23rd January 1980 State of the Union Address, Carter informed the U.S. Congress of his intent to resume military and economic assistance to Pakistan (Carter, 1980).

In February, Carter Administration offered $400 million in military and economic assistance to Pakistan, but Zia rejected it, calling it "peanuts." Pakistan's interest in the U.S. combat aircraft was still alive and the U.S. offered F-5. Pakistan was facing active Soviet-Afghan aerial incursions on one hand and Jaguar DPSA acquisition by India on the other. Agha Shahi, Pakistan's then foreign minister, argued that the F-5 were not good for night interceptions, a feature that was available with the Indian Jaguars (Burr, 2010; Hobbs, 2014). Zia instead requested the state-of-the-art F-16 multirole fighter. Carter initially turned down the request but relented and offered Pakistan F-16 at the last minutes of his meeting with Zia in the White House on 3rd October 1980.

As 1980 was an election year, Zia concluded that Republican candidate Ronald Reagan would win the elections and therefore saw no point in seeking security assistance from Carter. Zia casually noted that as Carter was busy with upcoming election campaign the matter should be put off till more opportune moment (M. M. Craig, 2017, p. 275; N. A. Salik, 2017,

pp. 52–53). Reasons for Zia's refusal to reach an agreement with Carter on F-16 procurement may have stemmed from the fact that only F-16/79 could be sold to Pakistan at the time. The aircraft was a downgraded version of F-16 A/B variants developed by General Dynamics because of Carter's 1977 directive under which American manufacturers could not sell other countries any combat aircraft that were qualitatively equal to those in the U.S. inventory.

Between 1979 and early 1980 Pakistan had been extensively briefed on F-16/79 (Tahan, 1986, p. 63). In April 1981, during Reagan presidency, Pakistan was still reportedly evaluating F-16/79 ("Pakistan Evaluates Fighters," 1981, p. 950). In the end, Pakistan found F-16/79 inferior to F-16A/B and inadequate to serve its long-term needs (Greenlee & O'Neill, 1984, p. 31). F-16/79 suffered from technological limitations. Compared to the original F-16's Pratt & Whitney F-100 engine the aircraft was powered by less powerful General Electric J-79 engine, the range and payload were inferior to the contemporary combat aircraft, and its air-to-ground strike capabilities were scaled back (*F-16/79: FX Export Fighter*, n.d.). This effectively removed the aircraft's ability to perform deep penetration strikes.

Reagan won the 1980 election and replaced Carter on January 21st, 1981. As an outcome of Carter's arms export directive, the U.S. arms sales to Third World countries began to decline in comparison to other supplier states like the Soviet Union (Kupchan, 1987, p. 64). Reagan therefore retracted Carter's policies and gave access to advance armament like F-16A/B to the U.S. allies. Reagan also intensified the U.S. investment in the Afghan War to dislodge the Soviets. To secure Pakistan's cooperation Reagan decided to cede to Pakistan's hard pressing. In December 1981 the U.S. Congress passed legislation authorizing the U.S. President to waive the restrictions placed by Glenn-Symington Amendments. Within days Reagan Administration concluded Peacegate 1 and 2 agreements with Pakistan for the sale of 40 F-16A/B. Contrary to Carter's views, Reagan believed that not only the sale of F-16 would not upset the military balance in South Asia but would also provide Pakistan an incentive to not go nuclear (I. Ahmed, 2013, pp. 268–269). First batch of F-16s arrived in January 1983.

The presidential waiver did not mean that Pakistan was immunised from the Congressional politics on non-proliferation issues. In 1984, Democratic senators Alan Cranston and John Glenn, of the eponymous Glenn Amendment, sought to add stringent provisions to the new legislature. The Cranston-Glenn Amendment proposed that no U.S.

assistance was to be provided to Pakistan unless the President was able to annually certify that Pakistan did not possess a nuclear explosive device, was not developing such a device, and was not acquiring technology, material, or equipment for the purpose of either manufacturing or detonating a nuclear weapon. In 1985, Republican senators Larry Pressler, Charles Percy and McC. Mathias Jr. cosponsored 'Pressler Amendment,' which sought to counteract some of the stringent features of Cranston-Glenn Amendment. It stated that no assistance was to be provided to Pakistan unless the President annually certified that Pakistan did not possess a nuclear explosive device and that the assistance provided by America would significantly reduce the risk that Pakistan will possess a nuclear explosive device (Akhtar, 2017).

Pakistan was mostly nonchalant on Pressler Amendment because it had been involved in drafting the Amendment. According to Najmuddin Shaikh (2021), who served as Pakistan's Ambassador to the U.S. from 1990 to 1991 and as Pakistan's Foreign Secretary from 1994 to 1997, while Senator Pressler had tabled the Amendment it was drafted by the State Department officials with Pakistani counterparts onboard. A more detailed clarification is provided by Shaikh to Rabia Akhtar (2018, p. 203), where he explains, "when the Pressler Amendment was first passed in 1985, we were told that without this Congress would not approve the continuance of the aid package passed in [FY] '81-' 82, and it was adopted with our consent on the clear understanding that certification would not be a problem for the duration of the air package." Akhtar (2018, p. 204), further attributes Pakistan's "calmness" to two more possible reasons. *First*, Pakistan had become overconfident in its perception that the U.S. needed Pakistan more than Pakistan needed the U.S., and *Second*, Pakistan had successfully conducted cold tests [of nuclear explosive devices] in 1983 and 1984, which added to its confidence that sanctions would not have any major impact.

Unfazed by the Pressler Amendment and satisfied with F-16's capabilities Pakistan sought to acquire more aircraft during George H. W. Bush presidency. In December 1988, Pakistan and U.S. concluded Peacegate 3 agreement for 11 more F-16s. In 1989, Peacegate 4 was concluded for 60 more aircraft (Soofi, 1997). In total, Pakistan had placed order for 71 more F-16s to bring the size of the aircraft's inventory to 110, equal to the number of A-7 that PAF previously hoped to acquire. F-16s provided PAF with an unprecedent qualitative edge in the air, and the incorporation of French Atlas-II laser targeting pods by Pakistan improved

aircraft's ability to perform deep penetration strikes, a capability Pakistan had so desperately sought earlier from A-7.

5.2.1.1. F-16 & Conventional Dominance & Deterrence

F-16s made two major impacts in favour of Pakistan. *First*, it effectively began to neutralise active Soviet-Afghan aerial incursion inside Pakistan. Between May 1986 to November 1988, PAF successfully shot down eight Soviet built Afghan aircraft, some of which were operated by Soviet pilots. This included a Su-25 piloted by the future and only vice president of Russia, Alexander Rutskoy. As its aerial incursions started to drawdown along with its occupation of Afghanistan the Soviets started equipping Afghan forces with SS-1 Scud-B SRBM. Around a dozen of these Scuds were later fired into Pakistan from Afghanistan in 1988 to target Afghan Mujahideen camps.

Second, it immediately added credibility to Pakistan's conventional, and later nuclear, deterrence against India. From the U.S. perspective F-16's sale to Pakistan may have been intended for countering Soviet-Afghan aerial incursions inside Pakistan against the Afghan Mujahideen – an anti-Soviet asset that the U.S. had heavily invested in – but there can be little doubt that for Pakistan F-16's acquisition primarily catered to its India-centric threats, and Pakistani officials made no secret of it with their U.S. counterparts (Wirsing, 1991, p. 132). On 16th December 1985, PAF's former Chief of Air Staff (CAS), Anwar Shamim, who had presided over F-16 induction, gave a talk at Institute of Strategic Studies in Islamabad on "The Role of F-16 in the Defence of Pakistan." According to Professor Robert G. Wirsing (1991, p. 132), who had attended the talk, Air Marshal (R) Shamim made it very clear that Pakistan had insisted upon F-16 over other aircraft because of the superior strike capability it offered against India. Air Marshal (R) Shamim added that a major bonus of the acquisition was that it had "saved Kahuta." This was in reference to reports of IAF preparing to attack KRL uranium enrichment facility.

On 20th December 1982, a Washington Post report, citing U.S. intelligence sources, stated that the Indian military leaders had prepared a "contingency plan for a pre-emptive strike against Pakistani nuclear facilities" to Indian Prime Minister Indira Gandhi (Benjamin, 1982). Akin to Israeli attack on Iraq's Osiraq nuclear reactor in 1981, India too had allegedly

conducted a feasibility study to similarly “attack and neutralise” KRL. The plan was reportedly formulated in June 1981 as a part of an air force review of strategy following IAF’s induction of Jaguars in 1980. Although India had relented from carrying out such strikes in fear of international condemnation the trepidation of possible Indian attack on its nuclear facilities persisted in Pakistan.

In fact, the ensuing paranoia has been dubbed by some experts as “Kahuta Syndrome” where Pakistan constantly feared an Indian, Indo-Israeli, Soviet, and even a U.S. attack on Pakistani nuclear installations (Chari et al., 2003; Sattar, 2010). However, as far as India is concerned, the situation began to change once Pakistan began receiving F-16s. It straightaway distorted IAF’s calculations. Though it still believed it could accomplish the mission objectives IAF now feared it may lose fifty percent of its slow-flying Jaguars to PAF’s F-16 that would defend KRL (Perkovich, 2000, p. 240). Emboldened by F-16’s superior deep penetration strike capability Pakistan authorities began communicating retaliatory threats to India.

Sometime in mid-1983, merely a few months after F-16s had landed in Pakistan, Chairman PAEC Munir Ahmad Khan met with his Indian counterpart Raja Ramanna in Vienna where both men had been attending an IAEA meeting. During their casual dinner meeting Munir alluded to Ramanna of Pakistan’s intent to retaliate against Bhabha Atomic Research Centre (BARC) near Mumbai if India carried out of an attack on KRL or PNSTECH. He warned that an attack on Pakistani facilities would release very little radioactivity given the smaller size of the enrichment plant and a research reactor at these places. However, an attack on BARC would lead to massive radioactive fallout over a large populated area (Perkovich, 1999, p. 241). This was essentially a threat not just to damage or destroy BARC but also Mumbai city.

F-16’s ability to translate Pakistan’s threat into action further instilled confidence in Pakistani authorities to mirror Munir’s warning. In 1984, yet another nuclear facility attack scare took place. The U.S. intelligence satellites had detected two squadrons of Jaguars missing from IAF airbase in Ambala, mere 300 miles from KRL. Given the geographic proximities, IAF deemed Jaguars more of strategic weapons against Pakistan then China (Perkovich, 1999, pp. 258 & 295). Thus, when Pakistani government received the information, it quickly began suspecting another potential attempt by India to attack KRL. General Zia

promptly cautioned the Indian leadership against any misadventure against KRL by threatening retaliatory conventional strikes on BARC. He too emphasised that the radioactive fallout over the city of Mumbai would cause phenomenal havoc (Siddiqa, 2001, p. 22). During the ISSI talk Air Marshal (R) Shamim was more candid in explaining F-16's role in averting these crises, stating that the aircraft's ability to penetrate India's air defences provided Pakistan with the ability to strike on BARC in retaliation to possible Indian strike on KRL, and in the process causing huge catastrophe for India (Wirsing, 1991, p. 132).

Many experts and Indian officials subsequently called the reports of Indian or Indo-Israeli plan to attack KRL dubious. However, Raja Ramanna would later confirm to the Times of India that Munir had indeed conveyed the threat and he had delivered the message to Indira Gandhi who then scrapped the idea (Laxman, 2015). From Pakistani perspective a conventional deterrence had now been established between the countries, thanks to F-16s. According to Dr Ayesha Siddiqa (2001, p. 22), the Pakistan authorities were of the view that the 'balance of terror' strategy is what dissuaded New Delhi from taking extreme action. This is reinforced by Air Marshal (R) Shamim's description of F-16 as "Pakistan's nuclear option minus the nuclear bomb" (Wirsing, 1991, p. 132).

Pakistan's claims were significant given that IAF was still numerically superior and was planning to further acquire Mirage-2000 and MiG-29, both being generational equivalent of F-16. According to Siddiqa (2001, p. 34), F-16 did not make Pakistan stronger than its adversary, but its acquisition did make it more robust than India wanted it to be. F-16's qualitative edge, quick deployment, and robust retaliatory capability in the face of India's numerical superiority helped create a unique deterrence relationship where neither side had demonstrated weaponised nuclear capability, yet they threatened a radioactive fallout by attacking each other's nuclear facilities with deep penetration strike capabilities of their combat aircraft. This coming to being of a 'radioactive deterrence' was further reinforced by the fact that the two governments were compelled to initiate a dialogue on not to attack each other's nuclear facilities in 1985. The *Agreement Between India and Pakistan on The Prohibition of Attack Against Nuclear Installations and Facilities* was formally signed in December 1988 (*India-Pakistan Non-Attack Agreement*, 1988).

5.2.1.2. F-16 & the Nuclear Deterrence

In 1988, PAEC started work on developing an operational atomic bomb. The readily available delivery vehicles were PAF's combat aircraft. Thus, NDC and Air Weapons Complex (AWC) were simultaneously created within PAEC and PAF, respectively, to jointly spearhead the development of an air-deliverable atomic bomb (F. H. Khan, 2012, pp. 185–186). On 27th July 1990, at the culmination of eight-month long exercise between PAF and PAEC, PAF's F-16 carried out a simulated nuclear bombing run and dropped an atomic bomb without a fissile material core (M. Ahmed, 2012, p. 301). In 1995, after making further improvements the desired results were achieved and thereby Pakistan acquired an operational nuclear weapons capability with F-16 and Mirage-V aircraft serving as delivery platforms (F. H. Khan, 2012, p. 187).

For a considerable period, Pakistan appeared more confident and dependent on aircraft option for nuclear strikes than on the available missile systems like Hatf-I, Hatf-II, M-series, and the early variants of Ghauri and Shaheen-I. Relative to the early ballistic missiles, F-16 and Mirage-V offered greater payload and combat radius (Masood, 2007, p. 182). Moreover, there were more aircraft available than ballistic missiles. Pakistan's contentment with the air-deliverable nuclear bomb option also stemmed from the fact that up until its 1998 nuclear tests India too was almost exclusively reliant on aircraft for a nuclear strike (Mehta, 2004). In the 1980s, IAF had acquired MiG-27, Jaguar, and Mirage-2000 aircraft, which had the avionics and capacity to carryout nuclear strike, and some reportedly had been modified for the purpose. The most likely contenders for the nuclear mission, however, were the Jaguars (Perkovich, 1999, p. 295).

Even though, India was actively pursuing Prithvi SRBM and Agni MRBM they were primarily the projects of DRDO with military unimpressed with Prithvi and out-of-loop on Agni, which allegedly was mere technology demonstrator. Moreover, India was mostly constrained in the development of Agni, while Prithvi suffered from slow production rate, readiness and safety limitation (Tellis, 2001, pp. 233–234). Pakistan may have expected India to continue to rely on aircraft option for its small nuclear arsenal and likely found it prudent for itself to follow a similar path. Pakistan also lacked the technical and industrial base for advance ballistic missile development and undertaking such an ambitious venture for its small

sized nuclear arsenal would also not have been economical. On the other hand, F-16s were more than adequately counterpoised against both IAF's aircraft and Prithvi SRBM. These reasons may account for the peripheral importance assigned to ballistic missile developments in the early years relative to the nuclear weapons programme.

In the first half of 1990, Pakistan and India went through what leading analysts on South Asia called the "Compound Crisis." It was allegedly the first confrontation between India and Pakistan with nuclear undertones (Chari et al., 2003, 2007). Two years after the crisis American journalist Seymour Hersh (1993), claimed that by late May of 1990 the U.S. intelligence had concluded that Pakistan had put together six to ten nuclear warheads and that a number of senior analysts were convinced that some of those warheads had been deployed on F-16s. Hersh cited a U.S. intelligence source stating that Pakistan had "F-16s pre-positioned and armed for delivery – on full alert, with pilots in the aircraft." Hersh's claims were controversial and rubbished by the U.S. officials (Krepon & Faruqee, 1994). However, later information suggests that a nuclear confrontation may instead have been brewing earlier in January when Islamabad reportedly received information that there was yet another Indo-Israeli plan for a preventive strike on Pakistan's nuclear facilities.

On 20th January 1990, the Pakistani leadership troika comprising of Prime Minister Benazir Bhutto, President Ghulam Ishaq Khan, and COAS General Aslam Beg decided to launch both a diplomatic and a military mission to deter the impending threat. In an interview with Feroz Khan (2012, pp. 229–231), Beg claimed that then Foreign Minister Sahabzada Yaqub Khan was sent to India to communicate that whether the attack comes from Israel or elsewhere Pakistan will hold India responsible and strike back. Beg further claimed that Benazir Bhutto ordered Pakistan Army and PAF to get ready, leading to a squadron of F-16s being deployed to Mauripur Airbase in Karachi and nuclear devices from KRL and other places being pulled out to arm the aircraft.

Beg asserted that all the movement was made in a way that was visible to the U.S. satellites. One of the most controversial aspects of Beg's claim lays herein. Beg believed that the U.S. was in on the impeding attack as such an action could not happen without its approval and "it was therefore necessary to convey deterrence signalling by letting the Americans pick up Pakistani preparations and convey it to both India and Israel about the consequences."

The voracity of General Beg's claims on making diplomatic threat is put to question by Feroz Khan's interview with Yaqub Khan, who dismissed any role played by him in conveying the nuclear threat to India (F. H. Khan, 2012, p. 231). The deployment of F-16s equipped with nuclear bombs during the crisis also remains not only unverified but questionable given the fact that PAF had begun atomic bombing simulation six months later on 27th July 1990 and took further time to make improvements in the bomb design and delivery mechanism (M. Ahmed, 2012, pp. 301–303).

The U.S. national security community was also divided over Pakistan's ability to modify F-16s for nuclear delivery, though many believed that it was no rocket science. While Deputy Assistant Secretary of Defence Arthur Hughes testified to Congress in August 1989 that modifying F-16s to deliver nuclear weapons "far exceeded the state of the art in Pakistan and could only be accomplished with a major release of data and industrial equipment from the U.S" some in the U.S. intelligence community, like CIA intelligence officer Richard Barlow, argued to the contrary and called Hughes' statement as deliberately falsified (Layton, 2007). In 1992, two years after the crisis had ended, CIA Director Robert Gates gave a statement to Congress that there was information suggesting that Pakistan was clearly interested in enhancing the ability of F-16 to deliver nuclear weapons and that 'it did not require those changes' (Lewis, 2005).

Gate's statement fell just short of an official confirmation that Pakistan had indeed successfully modified the aircraft. Interestingly, no modifications were officially reported by the U.S. government when the Pakistani F-16s were given a mid-life upgrade after the cooperation resumed between the two countries during George H. W. Bush's presidency. However, Pakistani officials, particularly the scientific community, have been candid about modifying F-16s for nuclear bomb delivery. Although their statements also fall short of an official state level confirmation. For the duration of early to mid-1990s F-16 served as the primary nuclear weapons delivery vehicle. F-16's modification leaves little to argue that similar modifications for nuclear strike role would not have found their way onto A-7. It was after all a matter of strategic necessity.

5.2.2. U.S. Sanctions Trigger Pakistan's Dual-Track Ballistic Missiles Acquisition

Unfortunately, as the Soviets were preparing their withdrawal from Afghanistan, the *ad hoc* nature of the U.S.' military assistance to Pakistan unravelled. In October 1990, President Bush refused to certify to the Congress that Pakistan did not possess a nuclear explosive device under the provisions of Pressler Amendment and thereby terminated all aid and military sales to Pakistan, including the supply of 28 F-16s that Pakistan had already paid for (Cirincione et al., 2005, pp. 244–245). From Pakistani standpoint just as the U.S. had achieved its strategic goals in Afghanistan it had no further reason to turn a blind eye to Pakistan's nuclear ambitions (T. Farooq, 2016, p. 52).

Pakistan felt indignant and abandoned by the U.S. as sanctions gradually eroded the efficacy of its conventional war fighting capability and nuclear deterrence in the face of ongoing Indian military modernisation. India managed to acquire advance weapons – especially for its air force – from European countries and the Soviet Union without any of the political constraints. Without the additional F-16s and the U.S. logistical support Pakistan was left with a flagging air force, much as it was in the 1970s. The reasons for invocation of Pressler Amendment related sanctions, however, laid in Pakistan's own actions, at least from the U.S. perspective.

In 1989, Prime Minister Benazir Bhutto made a promise to President Bush that Pakistan would keep its uranium enrichment short of weapons-grade level, and that it would not convert its existing weapons-grade uranium from gas to metal, which could then be utilised for making nuclear bomb cores. In return President Bush, under the provisions of the Pressler Amendment, certified to the U.S. Congress that Pakistan did not possess a nuclear explosive device and thereby paved way for selling more F-16s to Pakistan under the Peacegate 3 and 4 agreements (Hagerty, 1995). However, in 1990, Pakistan allegedly lifted its promised moratorium on enrichment. Robert Oakley, who served as the U.S. ambassador to Pakistan in 1990, recalled that the "freeze on Pakistan's nuclear program[sic] was removed. And the program[sic] began to move forward again. This is what led eventually to the application of the Pressler Amendment" (Krepon & Faruqee, 1994, p. 7).

The question that arises here is, why at a critical juncture Pakistan chose to take a risk in its relations with the U.S.? One explanation could be that the security challenges arising from the 1990 Compound Crisis compelled Pakistan to restart the enrichment. However, the enrichment is believed to have restarted sometime after the crisis had ended, thus it could not have served any security or deterrence related objectives at the time. It is also likely that Pakistan was proactively preparing to deter India in potential future conflict. Cheema, Chari, and Cohen (2003, p. 117), however, suggest that the enrichment took place as a policy of "strategic defiance" of the U.S. An American official cited by the authors expressed the belief that "Pakistan, anticipating the end of the Cold War, knowingly pushed its nuclear program[sic] to allow it to move away from the United States." The policy of 'defiance' came with the emergence of a new civilian and military leadership in Pakistan after General Zia's death in a plane crash in August 1988. The new military leadership had been seeking to break with the U.S. as early as 1987 Brass-Tacks crisis with India and they saw the nuclear programme as a way to achieve this break (Chari et al., 2007, pp. 76–77). With Zia gone they perhaps now found it opportune to exercise the breakup.

Pakistan's tendency to defy the U.S. was not an entirely a new policy. It resonated the strategic and stoic defiance of the U.S. instigated by Z.A. Bhutto in the 1970s. Although Bhutto had initiated Pakistan's nuclear weapons programme citing Indian threat his narrative thereon had only one challenger, the U.S., and he made public enemies out of personalities like Kissinger and Carter. Where Bhutto showed willingness to "eat grass" and reject the 'carrots' of U.S. military assistance and defy the 'sticks' of sanctions for keeping the nuclear weapons programme, Pakistan's new military leadership was now willing to do the same. It could be that the mistrust of the U.S. that Bhutto had propagated in the 1970s had seeped into common military officers as well and the geopolitical developments that took place thereafter only served to reinforce military's predispositions about the U.S. If true, then Zia-Reagan cooperation was nothing more than an atypical phase in the U.S.-Pakistan relations.

On the U.S. side, some in the Congress saw the invocation of Pressler Amendment as a mean to deter Pakistan from moving ahead with its nuclear weapons programme and to also send a strong message to future nuclear aspirants (N. T. Farooq, 2013, p. 114). However, instead of being dissuaded Pakistan began compensating for the loss of military assistance, especially of F-16s, by improving its nuclear weapons design. Dr Samar Mubarakmand, one of

the leading scientists in Pakistan's nuclear warhead and missile programmes, explained that based on the assumption that F-16 may or may not come Pakistan scientists were constantly miniaturizing the warhead designs to make them light and deliverable through alternative means (F. H. Khan, 2012, p. 278). Pakistan's quest for alternative means moved South Asian nuclear arms race into what former U.S. Deputy Secretary of State Strobe Talbott (2004, p. 21) described as "another lane: a competition over the acquisition of ballistic missiles."

Ballistic missiles quickly emerged from the periphery to the forefront as the top national security priority, second only to Pakistan's nuclear weapons programme (F. H. Khan et al., 2004). According to Dr Mubarakmand, in 1988 PAEC had begun working on developing a complete "nuclear weapon system" that would be capable of being deliverable by missiles (M. Ahmed, 2012, p. 301). This would indicate that Pakistan had intended on eventually pursuing ballistic missile development. Keeping the range and payload limitations of Hatf-I and Hatf-II – which were developed a year later – in mind it is likely that Pakistan would have begun pursuing more sophisticated ballistic missiles at some point of maturation of its nuclear weapons programme or would have made gradual improvements in the Hatf series.

As discussed previously, there are indications of Pakistan developing of a longer-range Hatf-III, though this missile too is likely to have suffered from technical limitations. The Pressler Amendment related sanctions, however, hastened Pakistan to forgo its indigenous design in favour of more sophisticated and longer-range Chinese and North Korean systems. This is evident by the fact that Pakistani senior military officials have on several occasions elucidated that the primary consideration in pursuing the dual-track approach had been to make up for the disparity in the air power, though the ballistic missile development also offered to simultaneously counterbalance Indian ballistic missile programme as well (Karamat, 2004; N. A. Salik, 2002a).

Lessons learned from the entire combat aircraft saga, beginning with negotiations with the U.S. on A-7 to the invocation of Pressler Amendment, and subsequent deliberation by Pakistani senior military personnel, such as former COAS Jahangir Karamat (2004) and Feroz Khan (2012, pp. 251–252), help explain how from Pakistani perspective ballistic missile, particularly the ones from its dual-track approach, offered to compensate for the vacuum created by the cancellation of sale and supply of F-16s.

First, Pakistani military had a constant requirement for deep penetration strike capability. Medium and long-range ballistic missiles not only offered Pakistan with greater combat radius to carryout strikes deep inside India but, unlike aircraft, they were extremely difficult and expensive for the enemy to reliably defend against.

Second, the cut-off of F-16's supply and its spare parts by the U.S. threatened a premature attrition of the aircraft's inventory and its supporting infrastructure, and with India's continued air force modernisation with acquisitions of aircraft like Mirage 2000, MiG-29 and later Su-30MKI, augmented with beyond visual range (BVR) capability, Pakistan was also looking at rapid erosion of its qualitative edge.

Third, mobile ballistic missiles offered not only flexibility and survivability through dispersal but also diversified the options for delivering conventional and nuclear payloads. If India uses its superiority to launch pre-emptive air strikes against Pakistani air bases and strategic assets, rendering PAF unable to carry out its conventional and strategic roles, Pakistan could then employ its ballistic missiles against India. Conversely, ballistic missiles could also provide Pakistan with a pre-emptive strike option of its own.

Fourth, ballistic missiles are generally considered as the primary means of delivering nuclear weapons. With Pakistan having achieved a *de facto* nuclear power status by late 1980s to early 1990s, it was only logical for Pakistan to at first augment and later offset the aircraft option with ballistic missiles for nuclear strike role.

In short, mobile ballistic missiles from its dual-track approach provided Pakistan with a reliable, survivable, and credible conventional and nuclear payload delivery capability. It served as a contingency to aircraft in conventional role and as a primary delivery vehicle in the nuclear role. And, with indigenous missile developments eventually offsetting F-16s they further provided Pakistan with strategic autonomy in its conventional and nuclear posturing, delinked from the U.S. pressures. However, this is not to say that Pakistan intended to abandon the aircraft route altogether. To reduce its dependency on the U.S. Pakistan also began an indigenisation drive to build conventional weapons. Much like in the case of ballistic missiles Pakistan turned to China for the purpose. The crown jewel of this is the development of JF-17 Thunder combat aircraft.

Although initially intended to be a low-cost multirole fighter the newer variants of JF-17 now offer equal or superior capabilities to F-16s in PAF's inventory. In the interim Pakistan appears to have diverted air-deliverable nuclear assets to its Mirage-V aircraft. As of now, all publicised launches of nuclear capable Ra'ad and Ra'ad-II ALCMs have taken place from this aircraft. These legacy aircraft are, however, slated to be replaced with JF-17s. It is thus likely that the nuclear strike role will subsequently be assigned to JF-17s as well if it hasn't been already. Additionally, Pakistan's delinking of strategic role from F-16s may have proven helpful in acquiring more advance F-16s during George W. Bush presidency.

5.2.2.1. Failure to Reconcile & Undeterred Progression in The Dual-Track Approach

In the long run, Pakistan's dual-track approach to ballistic missile acquisition has been successful in both overcoming the sanctions and in offsetting the aircraft option for nuclear weapons delivery. However, both the policy of defiance and the Pressler Amendment did not pan out well for their instigating countries throughout the decade of 1990s. Pakistan wanted the 28 F-16s it had already paid for. The U.S., on its part, lost significant influence in Pakistan. When Bill Clinton took over the U.S. presidency from President Bush in 1993, he inherited the added challenge of dealing with ballistic missile proliferation in South Asia. Owing to Pressler Amendment Bush did not leave Clinton with much leverage to use against Pakistan to cap its strategic weapons programmes.

Clinton's zealous South Asian non-proliferation policy met with continued resistance from both Pakistan and India. Sensing Clinton and his Democrat colleagues' strong pro-India bias, Pakistan pushed ahead with its strategic weapons programmes (Nawaz, 2008, p. 467). To regain some footing with Pakistan Clinton Administration tried reintroducing F-16s as a bargaining chip. According to Robert Einhorn, who served as Assistant Secretary of State for Non-proliferation from 1999 to 2001, Clinton tried enticing Pakistan by proposing to reopen F-16 issue if it made a formal commitment to exercise restraints on its nuclear technology and missile development (Nawaz, 2008, p. 477).

The proposal Clinton presented to Pakistan in early 1994 sought a Pakistani moratorium on its unsafeguarded fissile material production at KRL as well as banning the

deployment of its nuclear capable systems (Perkovich, 1999, p. 341). While insisting that it already was exercising restraint Pakistan also made it clear that with India continuing ahead with its nuclear activities accepting the U.S. terms would be 'choking on the U.S. carrots' (Nawaz, 2008, pp. 476–477). Indian officials on their part reacted negatively to a similar proposal for India and to the possibility of the U.S. resupplying Pakistan with F-16s. According to Talbott (2004, p. 30), Indian officials hinted that if the U.S. released the planes, they would deploy their missiles within striking distance of Pakistan's major cities.

Overall, the Indo-U.S. relations improved while Pakistan-U.S. relations continued to deteriorate. In April 1995, however, when Benazir Bhutto visited Washington D.C., President Clinton showed willingness to either release the 28 F-16s or reimburse Pakistan. After Bhutto's visit Republican Senator Hank Brown introduced Brown Amendment that would allow Pakistan to receive military equipment it had bought from the U.S. prior to the invocation of Pressler Amendment. While the amendment was passed, and Pakistan received several military items and spares for the existing F-16s, the 28 pending aircraft were, however, not delivered in order not to disturb India and in response to Pakistan's purchase of M-11 missiles from China. (Nawaz, 2008, p. 478; Siddiqa, 2001, p. 99).

Much as with the fissile material production both the military and civilian leadership in Pakistan defied all sorts of pressures from the U.S. on the missile issue. Both Pakistan and China denied any cooperation in the field of missilery, but the Clinton Administration tried to strongarm both countries into confessing M-11 missile transactions. According to then Pakistani Foreign Minister Asif Ahmed Ali, in 1996 Strobe Talbott pressed him to confirm that China had indeed supplied Pakistan with M-11 missile launchers and in return the U.S. would unilaterally take Pakistan off the MTCR sanctions list. Upon sharing this information with his Chinese counterpart, Qian Qichen, Asif Ali found that Talbott had made a similar offer to China as well (T. Farooq, 2016, p. 148). Bilateral relations became even more problematic over missile proliferation issue when the U.S. found out about Pakistan-North Korea missile related dealings. The U.S. suspected a nuclear for missile technology barter deal between Pakistan and North Korea and on several occasions warned Pakistani leadership that the cooperation needed to stop (Talbott, 2004, p. 150). Regardless of the U.S. pressure the cooperation with North Korea continued.

In March 1998, the right-wing BJP government came to power in New Delhi. The BJP had promised in its election manifesto to “re-evaluate the country’s nuclear policy and exercise the option to induct nuclear weapons” and to pursue the "development of the Agni series of ballistic missiles with a view to increasing their range and accuracy" (Perkovich, 1999, p. 407). In view of the BJP’s hawkish stance on both India’s nuclear and missile policies and on relations with Pakistan the U.S. Secretary of State Madeline Albright had written a letter to Prime Minister Nawaz Sharif on 20th March 1998, which sought “strategic pause” from Pakistan in its arms rivalry with India. According to Feroz Khan (2012, p. 267), Albright sought Pakistani cooperation on five major measures:

1. Avoid a public display of new weapons
2. Avoid a public announcement heralding the accomplishment of a nuclear/missile program
3. Avoid flight testing ballistic missiles
4. Avoid deploying missiles near a common border
5. Refrain from declaring nuclear weapons status

Khan further states that Pakistan was informed that a similar letter had also been sent to India, prompting Islamabad to interpret the intent of the letter(s) as the U.S. offer to “calm down the hawkish proclivities of the new Indian government.” The timing of the letter led the Pakistani authorities to suspect that there had been a tipoff as Pakistan had planned to conduct the first flight-test of Ghauri, a locally assembled No-dong missile, the same month and then parade it on Pakistan Day on 23rd March (F. H. Khan, 2020). Nevertheless, COAS Jahangir Karamat, who had been on a visit to the U.S. in the first two weeks of March and had come under pressure there not to conduct missile test, requested the government that Ghauri’s flight-test be postponed and the missile not be displayed at the national parade. According to Khan, Pakistan decided to cooperate even before knowing what the Indian government’s response might have been” to Albright’s request, assuming that a such a request had indeed been made to it.

However, on 6th April 1998 Pakistani authorities decided to abandon the “strategic pause” and carried out the first flight-test of Ghauri. Pakistan argued with the U.S. over its lack of resolve against the past 16 flight-tests of Prithvi by India. The U.S. responded by

arguing that Prithvi was an indigenous missile system, whereas what Pakistani intended to test was North Korean No-dong (F. H. Khan, 2020). Ghauri's flight-test immediately provided BJP leadership with an excuse to conduct nuclear weapons tests, which took place on 11th May 1998. To convince Pakistan not to follow in India's footsteps Strobe Talbott arrived in Pakistan with an offer of F-16s and more aid. However, on 28th May 1998, Pakistan tested five underground nuclear devices, and on 31st May 1998, Pakistan exploded sixth nuclear device in a one upmanship to the Indian tests (Mohanty, 2013, p. 92). Talbott (2004, p. 90) later opined that "in May 1998 the leaderships in New Delhi and Islamabad knew that by testing they would be bringing additional sanctions down on their heads. Not only were they undeterred—they tested largely to demonstrate that they rejected American (and international) admonitions, and that they were confident they could survive the consequences."

Much like Carter's policy shift from prevention to mitigation, Clinton too alternated from attempting to cap Pakistan's (and India's) strategic weapons programmes to mitigating them, especially after the nuclear weapons tests, but only achieved derisory gains. From 1994 to 1998 on occasions Clinton would raise Pakistan's hope, provide some relief, but always fall short of delivering the country from Pressler Amendment related sanctions and releasing the 28 F-16s. After the 1998 nuclear weapons tests Clinton insisted that both India and Pakistan sign the Comprehensive Test Ban Treaty (CTBT). Pakistan tried to raise the stakes for acceding to CTBT. According to Talbott (2004, p. 108) Pakistan requested a comprehensive relief package from the U.S., which involved complete and permanent lifting of all sanctions, a massive economic bailout, resumption of military assistance and delivery of F-16s, and above all security assurances that included a theatre missile defence (TMD) system to protect against Indian Agnis and Prithvis ballistic missiles.

With no such assurances or support coming from the U.S. and Pakistan facing increasing disparity in air power with India and the possibility of premature degradation of its air force due to slow pace of force modernisation because of the U.S. sanctions it pushed ahead with the ballistic missile development. In April 1999, almost a year into its Ghauri and nuclear weapons tests, Pakistan pushed ahead with its defiance of the U.S. non-proliferation policies and sanctions by conducting first flight-test of Shaheen-I.

5.2.2.2. Post-9/11 Pakistan-U.S. Relations

The U.S. President George W. Bush lifted the Pressler Amendment and resumed military and economic assistances to Pakistan after 9/11 to muster its support for the War on Terror in Afghanistan. This paved way for the U.S. to supply Pakistan with latest F-16s with advance armaments. Ostensibly Bush Administration supplied Pakistan with the aircraft to combat cross border militancy but the U.S. ambassador to Pakistan Anne Patterson wrote in a communiqué to the State Department that "an enhanced F-16 programme also has deterrence value by giving Pakistan time and space to employ a conventional, rather than nuclear, reaction in the event of a future conflict with India" (Iqbal, 2019).

The renewed cooperation and providing Pakistan with access to some of the superior U.S. conventional weapons as well as funds to buy them did provide some leverage to the U.S. to influence Pakistan's nuclear and missile related activities, and in its dealings with North Korea. Unlike the previous two Administrations when Bush Administration provided evidence of A.Q. Khan's suspicious nuclear dealings with North Korea, Pakistani leadership decided to suspend further missile cooperation with that country and reprimand Dr Khan. The fact that North Korean missile technology was mediocre and problematic also played an equally important, if not greater, role in the decision. However, that is as far as the U.S. leverage went.

The limits on the U.S. leverage were, amongst other things, imposed by the Bush Administration's desires to cultivate even closer security relationship with India. The prospects of the U.S. providing India with more advance military equipment than it had allotted to Pakistan were greater (R. W. Jones, 2004, p. 34). Of concerns were the 2005 U.S.-India Civil Nuclear Agreement, which turned a blind eye on India's bomb-grade fissile material production, and a possible collaboration on BMD systems. From Pakistani perspective, the U.S.' interest in buttressing India's already superior defence for containing China came at the expense of Pakistan's security and undermined the fragile nuclear deterrence in the region. In reaction to the Indo-U.S. strategic partnership Pakistan began expanding its civilian nuclear cooperation with China and increased investment in missile development (Abbas, 2018, p. 477).

5.3. China and North Korea: The Causal Enablers

Pakistan began its weapons indigenisation efforts in the 1990s. However, given its mediocre industrial base Pakistan had little options but to seek extensive technical assistances from outside. Cautious of the political precariousness of Western suppliers Pakistan looked towards East for military technologies. For ballistic missiles the only suppliers available were China and North Korea. In line with Pakistan's policy of defiance of the U.S., China and North Korea too were exercising similar policies. Not only were they willing to proliferate missile technologies but were also willing to defy the U.S. pressure and the MTCR restrictions, for as long as they could.

Throughout the 1990s, Pakistan and China stated that they were abiding by the MTCR's norms. These were, however, mere claims issued when being policed by the U.S. On several occasions the U.S. imposed sanctions on Pakistan and China, as well as North Korea, for their missile cooperation and each time the cost of the cooperation increased for these states than perhaps the rest of the missile proliferating nations have had to endure. In the end, Pakistan successfully circumvented the hurdles created by the MTCR and overcame the U.S. pressures. A matter of curiosity, however, is the unrelenting support extended by the external suppliers for Pakistan's missile programme in the face of mounting international pressure. China particularly had perhaps more to lose than to gain with such a cooperation, yet it went ahead with it. The following discussion thus explores the reasons and rationales for China-Pakistan and Pakistan-North Korea missile cooperation, and the zeal to defy and overcome the U.S. pressures.

5.3.1. China

China's role in Pakistan's strategic weapons programme is the most oft-cited aspect in the two countries' bilateral relationship. Western opinion largely holds that Pakistan wouldn't have been able to build a nuclear bomb without Chinese assistance. Pakistani experts on the other hand claim that the Chinese assistance was a "supplemental" and that the bomb was mostly a result of Pakistan's own effort (F. H. Khan, 2012, p. 175). Chinese help in Pakistan's ballistic missile programme is, however, more significant. Pant and Bharath (2008), state that Pakistan's missile capability was spurred, in part, by the easy availability of Chinese missile

technology. There is, however, no incriminating evidence to support this assertion. Doors were open to Chinese missile capability in 1987 when China sold liquid-fuel DF-3A IRBM to Saudi Arabia. Yet, Pakistan bypassed the opportunity to acquire this long-range nuclear capable missile to pursue own programme, resulting in development mediocre Hatf-I and Hatf-II. Pakistan may have opted out of DF-3A because it was a notoriously inaccurate missile for conventional strikes, but then again, Pakistan also lacked guidance technology for its own programme.

Sino-Pakistan cooperative efforts in the field of rocketry and missilery nevertheless began that same year when Pakistan's Prime Minister Muhammad Khan Junejo inaugurated a rocket propellant plant in the town of Havelian. On the occasion, Junejo expressed gratitude for the Chinese assistance to Pakistan in the field of defence and stated that the plant was also a testimony of such a Chinese cooperation ("Junejo Opens Rocket Propellent Plant in Havelian," 1987). China is assumed to have assisted Pakistan in its development of Hatf-I and Hatf-II but what role the Havelian plant played in the development of these missiles is unclear.

The major Chinese contribution to Pakistan's ballistic missile programme, however, began in the early 1990s with the sale and TOT of M-series solid-fuel ballistic missiles. As emphasised earlier, these missiles were far more sophisticated than the first two Hatf SRBMs, offered greater ranges, had an operational military value in conventional role, and would serve as templates for Pakistan's future nuclear capable long-range solid-fuel missile systems. At least five strategic rationales can be summarised for China's sale of M-series missile systems to Pakistan.

First, China and Pakistan maintained strong diplomatic and military ties, which was backed by their mutual desire to maintain strategic balance in South Asia – as they perceived it. For China this meant keeping the growth of Indian power and its hegemonic designs in check by ensuring Pakistan security (Medeiros, 2002, p. 28; Rajain, 2005, p. 160). The sale of M-series ballistic missiles to Pakistan would not only reinforce its bilateral relations and guarantee long-term military assistance to its "all-weather ally" but also serve to create strategic hedge against India and tie it down in the South Asian regional arms race. Even as Sino-India relations began showing marked improvements in the mid-1990s China continued to assist Pakistan.

Second, Chinese sales of ballistic missiles were motivated by commercial interests. The M-series missiles were, after all, developed for exports. But the commercial aspects of missiles sales were not just driven by state-level transactions. There was a strong case for domestic industrial incentive involved in the transaction. M-9/DF-15 and M-11/DF-11 had been developed by two different organisations, i.e., CALT/CASC and CSSG/CASIC respectively. According to Medeiros, Cliff, Crane, & Mulvenon (2005, pp. 69–70), the manner in which the two manufacturers made improvements in the operational capabilities of their missile systems suggested a continued competition between the two organisations that had been incentivised by both domestic and international factors.

Some of these factors included rapid expansion of the Chinese government's demand for missiles, the missile manufacturers' exposure to domestic competition for military and civilian goods, and the missile manufacturers' exposure to and interactions with global markets for commercial aerospace-related products and services**.** Additionally, the rising demand for ballistic missiles in the third world countries during the 1980s and 1990s may have further spurred the competition to capture that market. One key customer was Syria with which China had made an agreement for the sale of M-9 missiles.

Third, as stated earlier, China was pursuing its own policy of 'strategic defiance' of the U.S. and of non-proliferation policies of the Cold War powers. According to Agha Shahi, a senior Pakistani diplomat who also served in the capacity of foreign minister, China's support of Pakistan's nuclear and missile programmes "was a deliberate act of sabotage, undermining the value of the Nuclear Non-Proliferation Treaty" (Levy & Scott-Clark, 2010, p. 128). China had refused to sign the NPT and believed that the spread of nuclear weapons to other countries would diminish the power of the U.S. and the Soviet Union and that the introduction of nuclear weapons to Third World nations could increase the opportunity for revolutionary change (Levy & Scott-Clark, 2010, p. 916).

Fourth, and in accordance with the *third* rationale, as much as Pakistan has sought to reduce dependency on the U.S. for military assistance, China too has sought to increase Pakistan's strategic autonomy in its dealing with the U.S. China's support for Pakistan's nuclear and missile programme is thus as much incentivised by its desire to minimise the U.S. influence in greater Asia as much as it is to contain India within the region. Much as the U.S.

had empowered its Western European allies against the communist Warsaw Pact states China likely seeks a militarily empowered nuclear Pakistan for its regional and international alliance. Moreover, a nuclear Pakistan unclutched from the U.S. dependency and pressures is likely to become more independent in its strategic behaviour and thus prove more effective in containing India.

Fifth, China was reacting to President George H. W. Bush's 1992 decision to supply F-16 fighter jets to Taiwan. It saw the decision as a violation of the August 1982 *Sino-U.S. communiqué* whereby the U.S. agreed to limit its arms sales to Taiwan to 'defensive' weapons and thereby responded by secretly going back on its 1987 commitment to voluntarily abide by the MTCR's guidelines and sold Pakistan M-11 missiles (Suettinger, 2003, pp. 140 and 172). In the end, F-16 became a double-edged sword for the U.S. non-proliferation strategy. Where Bush Administration's embargo on F-16 compelled Pakistan to seek out Chinese assistance for missile development on one hand its decision to sale F-16 to Taiwan provided China with an impetus to extend such an assistance to Pakistan on the other.

However, whatever the reasons be, China was willing to assist Pakistan so long it was not caught and sanctioned by the U.S. Thus ensued a cat-and-mouse game where China and Pakistan would furtively carry out the TOT of the M-series ballistic missiles all the while denying the covert trade. The U.S. intelligence had, however, suspected a potential missile deal between Pakistan and China since the beginning of 1991 and in June of the same year fifteen senators belonging to Republican and Democratic parties presented a joint letter to President Bush, which demanded that he "take appropriate action" against China to restrict its missile sales to Pakistan (Bradsher, 1991; Suettinger, 2003, p. 122). Consequent to Congressional pressure and media reports, President Bush imposed sanctions – effective in June 1991 – on two Chinese state-owned companies, the China Great Wall Industry Corporation (a commercial wing of CASC) and the China Precision Machinery Import-Export Corporation (an organisation that marketed missile systems from both CASC/CALT and CASIC/CSSG), which were believed to be involved in the sales of the missiles (*The Proliferation Primer: A Majority Report of the Subcommittee on International Security, Proliferation and Federal Services*, 1998, p. 3).

In November 1991, in a move for a damage control, Beijing reaffirmed its commitment to the U.S. for abiding by the MTCR Guidelines and in March 1992 it further provided a written assurance to that effect (Wolfsthal, 1994). With China also promising to sign the NPT the sanctions were waived immediately (Levy & Scott-Clark, 2010, p. 585). For a time, China appeared to have complied with its 1991 commitment by not acting on M-11 deal with Pakistan and cancelled the M-9 contract with Syria (Medeiros, 2002, p. 199). However, around the end of 1992, the U.S. intelligence reported a suspected shipment of M-11s to Pakistan (Bradsher, 1992). It immediately invited diplomatic ire from the U.S. for both China and Pakistan. The U.S. accused China of violating its MTCR related commitment by selling a nuclear capable IRBM. China, however, maintained that no sale took place (Milhllin & White, 1991; R. J. Smith, 1991).

Since the U.S. intelligence did not have any evidence that proved 'beyond reasonable doubt' that M-11 trade had taken place the experts cautioned the U.S. government against taking any punitive action on an issue with 'important consequences and repercussions' (Suettinger, 2003, p. 172). According to Robert L. Suettinger (2003, p. 172), who served as Clinton's intellegence officer for East Asia, "the past experience had shown that full imposition of sanctions against China would not prevent further M-11 shipments but probably cause more to be sold. Administration officials also knew that China probably would suspend whatever bilateral agreements were in place on other non-proliferation issues, and all further progress would cease until the sanctions were lifted by the United States."

However, after much diplomatic pressure Chinese ambassador to the U.S. Zhu Qizhen admitted to sales of "tactical missile" to Pakistan, though he did not identify them as M-11s (J. Wilson & Di, 1992). Both China and Pakistan argued that the allegations of the MTCR violations were false, insisting that the missiles in question were conventional SRBMs with technical parameters within the MTCR's limits (Milhllin & White, 1991). For the U.S., however, rationalisations provided by China and Pakistan were spurious given the fact that Pakistan's quest for nuclear weapons was by now out in the open and that it had been attempting to obtain a credible delivery system.

More importantly, M-11 potentially featured range and payload trade-off effect, i.e., by trading-off its 800kg payload for a 500kg payload the range of the missile could be

increased to around 300km (F. H. Khan, 2012, p. 238). Missiles able to achieve these specifications through the range and payload trade-off were held as Category-I systems under the MTCR Guidelines and therefore were restricted by the regime (F. H. Khan, 2012, p. 453). Between 1991 and 1993 the U.S. government twice determined that China had also transferred Category-II missile components for M-11 to Pakistan (*Chinese Proliferation of Weapons of Mass Destruction: Background and Analysis*, 1996).

In November 1992, U.S. intelligence noticed a shipment of M-11 missile parts headed for Pakistani port city of Karachi (Mann, 1999, p. 271). However, since the Bush Administration's term was coming to an end it decided to leave the Sino-Pakistan missile trade issue to the incoming Clinton Administration. President Clinton subsequently made ballistic missile proliferation in South Asia and Sino-Pakistan missile cooperation one of his paramount concerns. In August 1993 President Clinton imposed sanctions on China and Pakistan after deciding that China had violated its written assurances (Wolfsthal, 1994). Once again China managed to counteract the U.S. sanctions by signing the "Joint United States-People's Republic of China Statement on Missile Proliferation" on 4th October 1994 whereby it promised not to export "ground-to-ground missiles featuring the primary characteristics of the MTCR." China further agreed to prohibit the sales of missiles with range and payload trade-off effect, particularly ones which could be modified to a capability covered under the MTCR guidelines (*Joint US-PRC Statement on Missile Proliferation*, 1994). A day later President Clinton lifted the sanction. Pakistan, however, remained embargoed.

In June 1995, CIA concluded that China continued to export M-11 components to Pakistan. This generated a debate in the U.S. on whether China's actions had violated the MTCR and accordingly warranted sanctions against it (Sciolino, 1995). No substantial punitive actions were taken against China in the end. Instead, in the wake of nuclear weapons tests by India and Pakistan in 1998, the U.S. and China issued a "Joint Statement on South Asia" whereby the two agreed to prevent the export of equipment, materials or technology that could assist Indian or Pakistani nuclear weapons and ballistic missiles programmes, and to that effect, the two agreed to strengthen their respective national export control laws (*Sino-U.S. Joint Statement on South Asia*, 1998). Much as previously, the U.S. experts and intelligence community subsequently accused China of violating this Joint Statement as well, asserting that China continued to assist Pakistan in building facilities for producing solid-fuel

missiles. This time the focus was more on M-9 and the development of Shaheen-II MRBM, which the U.S. officials saw as a clear violation of the MTCR's guidelines by China (Medeiros, 2002, pp. 235–236).

By late 1990s, as the Sino-U.S. economic interests began to converge, China continued to remain exonerated from further sanctions since their lifting in 1994. Pakistan, however, remained embargoed because of its nuclear and missile programmes. Under Clinton Administration pressure only kept multiplying. The U.S. began pressurising Pakistan (and India) to sign NPT and other conventions aimed at controlling the production of fissile material and long-range missiles (D. Smith, 2011, p. 187). In 2000, Clinton Administration decided to impose MTCR Category-I sanctions against Pakistan's Ministry of Defence (MoD) and SUPARCO. The MoD, however, was not involved in the missile programme and Pakistani experts mainly see the sanctions as India appeasement measure (N. A. Salik, 2009, pp. 212–213). In September 2001, MTCR Category-II sanctions were imposed against NDC.

From Pakistani perspective the MTCR related sanctions by the U.S. have vastly been discriminatory – singling out Pakistan and letting India off the hook. Pakistani experts have been vehemently critical of the fact that no sanctions were never applied on India and Russia for their joint venture of 290km BrahMos supersonic cruise missile where Russian supply of propellent for the missile constituted violation of the MTCR's guidelines (F. H. Khan, 2004, p. 82; N. A. Salik, 2002a). Additionally, while Pakistan was sanctioned for its alleged restart of uranium enrichment in 1990, leading to cancellation of F-16 sales and support, the U.S. partially exonerated India's ISRO from the sanctions placed on it in October 1992 because of its role in the Agni programme and allowed shipment of supplies to India that had been in the pipeline prior to the imposition of the sanctions (Perkovich, 1999, p. 239).

5.3.2. North Korea

Pakistan and North Korea developed diplomatic ties in 1970s. Since then, there have been number of military transactions between the two countries whereby Pakistan procured certain North Korea produced Soviet origin conventional weapons to compensate for the U.S. arms embargo placed on it in the wake of its war with India in 1965 (Abbas, 2018). However, to assume that the relationship had any characteristics of an alliance, especially against

another country, would be inaccurate. Unlike China, North Korea had no strategic interest in arming Pakistan against India, nor did Pakistan-North Korea relations hold symbolic values as Pakistan-China relations have held.

Some scholars have assumed that the cooperation between Pakistan and North Korea was tri-lateral with China being the third partner. Some have also perceived and propagated North Korea as a possible conduit for China's missile proliferation to Pakistan (Chellaney, 2002, p. 127). There is also a belief that in January 1994 the three countries had signed a technical assistance agreement for cooperation in the field of missilery and related guidance systems (Mehta, 2004, p. 185; Rakisits, 2012). However, not only has this agreement remained unsubstantiated but any impression that China approved of Pakistan-North Korea missile cooperation, let alone participated in it, is erroneous.

One major political cost for Pakistan in its cooperation with North Korea was that it incensed China, leading it to discourage Pakistan from cooperating with North Korea. This was mainly because China held a market monopoly in missile technology transfer to Pakistan and was also wary of the possibility of being dragged into the controversy of Pakistan-North Korea dealings (F. H. Khan, 2012, p. 243). The benefits of North Korean missile assistance to Pakistan, however, exceeded that of China's – albeit only for a short period. At least three external or strategic rationales can be summarised for Pakistan seeking assistance from North Korea.

First, in contrast to Chinese sales of SRBM, North Korea was offering No-dong, an MRBM with range and payload greater than the Chinese M-series missiles. With 1200km-1500km range and ability to carry heavier payload the missile could carry out strikes deep inside India's heartland. Additionally, No-dong's range and payload characteristics also put it technologically ahead of India's Agni missile.

Second, North Korea was offering its missile technology at an inexpensive rate. But the low cost also came with inferior quality and performance. Adding up to the political costs of cooperation Pakistan was to soon realise it had made a bad investment.

Third, North Korea provided an alternative or fallback supplier option as China was increasingly coming under the U.S. pressure to discontinue its assistance to Pakistan's missile programme and to adhere to its MTCR related commitments (*Ghauri [Hatf-5]*, n.d.; F. H. Khan,

2012). China was becoming increasingly cautious, if not reluctant, in proliferating long-range ballistic missiles. Pakistan had to capitalise on the narrowing window of opportunity to acquire MRBM from North Korea before it too closed under the U.S. pressure. According to Feroz Khan (2020), Pakistan began pursuing an 'acquire all that you can' policy before the window of opportunity closed.

However, the question is, why acquire the problematic liquid-fuel missile system? While no clear answer has been provided by Pakistani officials over the years, three rationales could be postulated. *First*, Pakistan's acquisition of liquid-fuel missile in addition to its solid-fuel missile development was aimed at mirroring Indian ballistic missile programme, which too was based on a dual-track approach comprising of liquid-fuel Prithvi and solid-fuel Agni. According to Feroz Khan (2020), this indeed was one of the factors that made No-dong an attractive purchase. *Second*, North Korea was the only supplier of MRBM missile available to Pakistan and it only had a liquid-fuel system to offer. *Third* reason, which is backed by strong evidence, is that the acquisition was incentivised by internal-domestic organisational factors (for details see the Internal Dynamics section).

On its part, North Korea appears to have agreed to the cooperation for at least three reasons of its own. *First* for commercial and financial reasons. North Korea was a poor country that desperately needed funds. Its economic situation further deteriorated due the U.S. sanctions for its missile R&D, testing and proliferation activities. Arms sales were among North Korea's few sources of foreign currency reserves and its No-dong missile was one of the most sought-after products (Frantz & Collins, 2007, p. 208). This would also suggest that North Korea would have preferred cash from Pakistan for its missile technology, not a barter deal.

Second, North Korea needed another country to flight-test No-dong to gather more data on the missile. North Korea was geographically constrained in its missile flight-tests and could not afford further punitive measures from the U.S. and its neighbours for frequently testing missiles in their vicinity. For this reason, it undertook a moratorium on further missile testing following the Taepo-dong flight-test over Japan in August 1998 ("Pakistan and North Korea: Dangerous Counter-Trades," 2002).

Third, much like China, Pakistan, India, and other Third World countries in the decades of 1980s and 1990s, North Korea too was involved in a strategic defiance of the U.S. non-proliferation policies and punitive measures enforced against it. Despite these facts, Hassan Abbas (2018, p. 464) suggests that North Korea was initially hesitant in selling No-dong technology to Pakistan and only acceded to Pakistan's request after A.Q. Khan personally got involved in the negotiations. Explanations for North Korea's hesitancy is difficult to gauge given the fact it was involved in selling the same technology to other countries, including Iran.

Details of Pakistan-North Korea missile cooperation began emerging throughout the 1990s. In June 1992, representatives from KRL and other concerned governmental organisations visited North Korea's missile R&D facility at Sanum-dong to see the prototype of No-dong. The missile had a range of 1200-1500km and was believed to be derived from the Soviet R-17/Scud-C ballistic missile and perhaps incorporated some design features from the Soviet R-21 submarine-launched ballistic missile (SLBM) as well (*No Dong 1*, 2016; *Nodong*, n.d.). In August 1992, North Korea's Deputy Premier-Foreign Minister Kim Yong-nam travelled to Pakistan where he is believed to have discussed missile cooperation (Bermudez, 1999). In May 1993, a Pakistani team was again invited to witness the flight-test of No-dong. Preliminary negotiations for the missile were subsequently undertaken by Dr AQ Khan himself, which were followed by formal negotiations by Prime Minister Benazir Bhutto during her visit to North Korea in December 1993 (F. H. Khan, 2012; Squassoni, 2003).

In November 1995, North Korean team led by Marshal Choe Kwang, the vice-chairman of the National Defence Commission and minister of the People's Armed Forces, visited Pakistan where he is believed to have finalised an agreement to provide Pakistan with key components for No-dong and possibly Taepodong missiles as well, about 12 to 25 units of No-dong, and at least one Transporter Erector Launcher (Bermudez, 1999). The missiles or their assembly kits began arriving in Pakistan between 1996 and 1997, and the North Korean technicians began establishing missile assembly and related facilities at KRL to help with the development of the missile inside Pakistan (Fitzpatrick, 2007, p. 31). On 6th April 1998 Pakistan carried out the first flight test of No-dong's clone, or perhaps No-dong itself, with the designation of Hatf-V Ghauri.

It is widely believed by Western experts that cash-strapped Pakistan bartered uranium enrichment secrets with North Korea for its missile technology. Pakistani leadership and officials on the other hand have continuously rejected the allegations of barter trade and insist that the country had paid for the North Korean missile technology in cash. In 2004, Benazir Bhutto stated that the missile had been paid for by cash and in his autobiography General Musharraf (Musharraf, 2006) similarly stated that Pakistan paid for the North Korean "conventional ballistic missile" in "hard cash." In his interview with the researcher, Feroz Khan also strongly denied the charges of any barter deal.

According to Christopher Clary (2005, p. 64), the price tag of the North Korean missiles could have been between $48 to $100 million. Given the fact that SIPRI estimated Pakistan's arms imports between 1995-1996 to be around $819 million and the annual defence budget in the mid-1990s to be around $3 billion, the price tag of $100 million appears to be within Pakistan's financial capacity. In 2009 interview with Aaj TV, Dr AQ Khan rejected the notion of barter deal and stated that the missile was "hardly worth $50 million," a price tag at the lower end of Clary's assessment (*Pakistan: Dr Abdul Qadeer Khan Discusses Nuclear Program in TV Talk Show*, 2009). On the other hand, in their respective interviews with the researcher, Feroz Khan and Naeem Salik suggested that the cost was around $200 million. This price tag, though double of Clary's estimated ceiling of $100 million, remains well within SIPRI's estimation of Pakistani defence budget of the early to mid-1990s.

In the years since the A.Q. Khan proliferation network began to unravel Pakistani authorities have insisted that the transfer of uranium enrichment technology to North Korea was a standalone non-state level cooperation spearheaded by Dr AQ Khan in his personal capacity and that the Pakistani state had been unaware of Dr Khan's activities. Much of Pakistan's insistences and assurances have, however, been unable to convince the Western observers. Pakistan was also soon to find that missile transaction with North Korea was to be a technical, military, and a political misstep. Where the North Korean missile technology turned out to be unimpressive it was also not impervious to the U.S sanctions.

On 17th April 1998, the U.S. imposed sanctions against Pakistani and North Korean entities for their role in transferring MTCR Category-I ballistic missile-related technology (*CIA's Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons*

of Mass Destruction and Advanced Conventional Munitions - 1 January Through 30 June 1999, 2000). These sanctions came mere nine days after Pakistan's first flight-test of Ghauri. On 24th March 2003, the U.S. imposed sanctions on Changgwang Sinyong Corporation and KRL. After the new sanctions, the U.S. State Department spokesperson Philip Reeker clarified on 1st April 2003 that the sanctions were imposed only for a "missile-related transfer" and not the transfer of nuclear technology from Pakistan to North Korea (*Chronology of U.S.-North Korean Nuclear and Missile Diplomacy*, n.d.).

As the Pakistani nuclear and missile firms were already under strict sanctions from the U.S. further sanctions may have proven superfluous. However, a key worry for Pakistan was Japan, which was a key financial aid provider. Japan had held up a loan of $500 million to Pakistan in the late 1980s because of Pakistan's nuclear weapons programme but in 1992 it agreed to provide $100 million for humanitarian relief after Prime Minister Nawaz Sharif convinced Tokyo that Pakistan did not possess nuclear bombs (Wolfsthal, 1992). Pakistan was further seeking financial relief from the Asian Development Bank and Japan appeared to hold key to Pakistan's solutions. According to Feroz Khan (2020), the Japanese were not all too happy about Pakistan-North Korea missile cooperation and the presence of North Korean scientists and engineers inside Pakistan. The Japanese officials believed that the Pakistan-North Korea exchanges went beyond missile cooperation (Frantz & Collins, 2007, p. 221). However, Japan did not take any punitive measures beyond diplomatic castigations against Pakistan during the pre-nuclearised period of South Asia (Shaikh, 2021).

5.4. Conclusion

External-strategic issues, particularly India-centric security considerations, do explain Pakistan's decision to acquire ballistic missiles. However, the external-strategic causal mechanism is less straight forward than the available literature sets it out to be. While correlations characterised by intermittent action-reaction competition can be drawn between Pakistan and India's ballistic missile programmes the 'causal relationship' between the two programmes is 'weak.' In terms of timing and magnitude, as India made progress in its rocket and missile programmes between late 1970s to late 1980s, Pakistani missile programme journeyed from inaction to rudimentary missile developments.

Pakistan does not appear to have taken India's Prithvi and Agni ballistic missiles during their R&D phase as a serious enough of a security threat, and the supposed 'reactionary' development Hatf-I and Hatf-II was too perfunctory for these missiles to be utilised in a military role and therefore rendered their security and deterrence rationale problematic. Instead, these missiles appear to have resulted from efforts to internalise weapons R&D but were hastily flight-tested after India's Prithvi flight-test to establish a symbolic technological and political parity with India much as India had, in part, developed and flight-tested its missiles to catch up with China. In his interview, Feroz Khan explained that the two missiles were more of a political capability than a real military capability.

India's ballistic missile programme only became a matter of concern in the 1990s. This is evinced by General (R) Khalid Kidwai's (2020, p. 3) following statement: "in the nineties India upped the ante and introduced in its strategic inventory ballistic missiles Prithvi and Agni as short and medium range nuclear delivery systems covering the length and breadth of Pakistan. The resultant instability compelled Pakistan to respond through the development of Ghaznavi, Shaheen and Ghauri ballistic missiles ensuring that the vast geographical dimensions of the Indian peninsula came within the Pakistani strategic range. The Indian attempt to introduce strategic instability was adequately checked."

Of course, what complicates General (R) Kidwai's statement is the fact that the acquisition of the templates – i.e., M-11, M-9, and No-dong – for developing the mentioned Pakistani ballistic missiles, and perhaps also the preparation for the development of the mentioned missiles as well, had already preceded India's initial batch production of Prithvi-I in 1994 and preliminary induction in 1997, while Agni remained in trial phase throughout the period. This then reinforces the 'weak causal relationship' argument between the Indian and Pakistani programmes.

Some scholars find similarities between India-Pakistan and the Cold War U.S.-Soviet arms rivalry. However, the influence and constraints exerted by the U.S. on the Pakistani strategic weapons acquisition decision-making and the role of foreign suppliers like China and North Korea – who had their own vested political and financial interests in proliferating missile technology to Pakistan – shows that the causal mechanism of the Pakistan's dual-track ballistic missile acquisition is far more complex and multifaceted then "India exclusivity"

argument presented by some scholarships as well as the dyadic Cold War superpower competition. While India-centric security considerations set the momentum for the dual-track approach to ballistic missile acquisition the catalyst for the acquisition was, however, not India but the U.S.

A key strategic consideration for Pakistan in acquiring the concerned missile capabilities, as explained by General (R) Kidwai, was to ensure that "the vast geographical dimensions of the Indian peninsula came within the Pakistani strategic range." The need for such a capability, however, resulted from the depreciation in the existing long-range strike capability – i.e., air power – itself brought on by the loss of the U.S. as a major benefactor and source of modern combat aircraft like F-16 for Pakistan. As Narang (2009a, 2014) explains, there were no significant 'militarised crises' between India and Pakistan between 1990 and 1998, which could have warranted Pakistan to shift its nuclear posture. It was instead the American abandonment of it in the early 1990s that forced Pakistan "to prepare for a shift in nuclear postures, seeking missile delivery capabilities to adopt an asymmetric escalation posture to deter Indian conventional superiority."

The role of extra-regional players in triggering and propelling Pakistani dual-track ballistic missile acquisition, however, does not render the importance of India in the causal mechanism as insignificant. From 1990 and 1998, even as Pakistan accumulated and absorbed the foreign missile technologies, the ballistic missile programme remained in gestation. However, in the wake of South Asian nuclearization Pakistani programme has stepped out of opacity and India-centricity of the programme has become apparent – even though it had always been obvious. Analysis into the post-nuclearization 'intervening phenomena' – such as conflicts and crises, peace process, and development of defensive and offensive capabilities and warfighting doctrines by India – should be able to demonstrate the fact. These 'intervening phenomena' and their impact of Pakistan's dual-track ballistic missile acquisition are thus subject to exploration in *Chapter 6*.

However, based on the discussion in this chapter, it is pertinent to highlight that while external security factors have been important determinants of Pakistan's decision to pursue the dual-track approach political aspects have also governed the decision-making. On the regional level missile politics can best be defined as a situation where India maintains

ambition to maximise its share in global power politics and seeks prestige through the acquisition of dual-use ballistic missiles, which then tends to intensify the regional security competition. While India identifies China as the primary rationale for its programme the operational aspects thus far remain focused on Pakistan. But even more important is the fact that while India-specific military requirements may have contributed towards the instatement of the dual-track ballistic missile programme the developments within the programme, particularly that of the liquid-fuel component, have been shaped by domestic organisational/institutional political factors – phenomena that this research aims to explore in the second part of the thesis.

CHAPTER 6: EXTERNAL INTERVENING PHENOMENA

Arms “race” by definition entails recurrences and repetitions – the continuous development, production, and deployment of weaponry (Evangelista, 1988, p. 7). At different stages of a continuous or ongoing weapons programme number of *external* and *internal* sources of technological change, ones which may be different from the original causal phenomena, could ‘intervene’ and change the direction of a weapons programme. Many major weapon systems are conceived to serve for decades, and states continuously push the quality of such systems to preserve their destructive capabilities, improve their performance, produce more advanced and powerful spinoffs, and innovate new weapon systems to augment them. Certain other ‘intervening phenomena’ may also lead states to restrict, scale back, or eliminate their weapons programme or certain technologies from it. In essence, the issue of what sustains or restraints an ongoing weapons programme is as important as what caused it in the first place for understanding a state’s arms dynamics. On the external level such intervening phenomena may include,

1. State’s perception of growing threat of war, states considering initiating aggression, or a recent military disaster or a fear of future one (Evangelista, 1988, p. 9; Posen, 1984, pp. 74–79). In essence, wars, military conflicts, and crises, or growing threat of them, are likely sources for military technological change or innovation. On the flip, arms race literature also perceives change and innovation of weapons technology as a cause of wars, conflicts, and crises as well.

2. Technological impact of weapon innovations or fear of possible innovation by the adversary also threatens the ‘balance-of-power’ relationship by bringing about ‘qualitative change’ in the strategic landscape. States may decide to form or enter an international alliance, where possible, or innovate weapons to preserve the balance or adapt to the new reality (Evangelista, 1988, p. 9; Posen, 1984, pp. 74–79).

3. Conversely, cooperative peace efforts like arms control or disarmament measures, to a greater extent, and confidence building and risk reduction measures, to a lesser extent, could lead to restrictions, reductions, or elimination of certain weapon systems by states.

This chapter examines the role of ballistic missiles in India-Pakistan conflict/crises between 1989 and 2002, and the impact these conflicts/crises events have had on Pakistan's missile programme. Crucial to this discussion is also determining if the ballistic missiles have served their ultimate purpose, which in Pakistan's case is deterring Indian conventional aggression. This is followed by the analysis of the technological impact of innovations in India's missile programme on that of Pakistan's. Finally, the chapter deals with the cooperative peace efforts, particularly missile related confidence building measures, and whether they have had any restraining effect on Pakistan and Indian missile programmes. Central to the analysis of all three 'intervening phenomena' is to conclude if indeed the progress in Pakistan's dual-track ballistic missiles as well as participation in peace efforts are incentivised by India generated security concerns, as would be required by rational actor model.

6.1. Ballistic Missiles & Pakistan-India Conflicts & Crises

It has been argued that missiles in a neighbourhood may serve to correct imbalances in nuclear or conventional capabilities and hence lead to deterrence stability (Banerjee, 2004, p. 220). Nuclearization of South Asia led deterrence optimists to assume that nuclear weapons and ballistic missiles would be 'great equalisers' and would encourage India and Pakistan to disengage from their low-intensity warfare in Kashmir. However, since the coming to being of the 'new normal' in the India-Pakistan dyad, relations over Kashmir dispute and arms rivalry have mostly been characterised by instability and sub-conventional conflicts and crises (Kumar & Vannoni, 2004). In the bracket of 1989 and 2004, India and Pakistan have gone through four military crises and one violent sub-conventional conflict. In the ones that have come after the overt nuclearization of the two states, ballistic missile development and flight-tests have played important role of nuclear signalling.

6.1.1. Compound Crisis, 1990

The Compound Crisis of the 1990 was the first of the hostile situations between Pakistan and India after both had become *de facto* nuclear weapons states. The two countries had also by now demonstrated their respective ballistic missile capabilities, although the developments on both sides at the time were rudimentary at best and their respective

missiles were not known to have been nuclear capable. Available evidence does not indicate any involvement of ballistic missiles in the crisis. However, Pakistan's former spy chief General (R) Asad Durrani (Dulat et al., 2018, p. 54; 2018, pp. 73 and 317), recalls that the U.S. had misinterpreted intelligence data leading it to misconstrue construction cranes and trucks carrying construction pipes on the Pakistani side for missiles.

The crisis nevertheless is argued to have provided impetus to both the countries to further advance their nuclear weapons capabilities and assign greater urgency to nuclear weapons delivery mechanism. Pakistan took the brunt of the U.S. disapproval and in the aftermath of the crisis was imposed with Pressler Amendment sanctions for its uranium enrichment activities (Krepon & Dowling, 2018, p. 200). This then served as catalyst for Pakistan to seek out more sophisticated ballistic missiles from China and later North Korea.

6.1.2. Prithvi's Deployment, 1997

In 1994, Prithvi-I entered initial production phase, leading to a debate over its deployment in India. Despite being dissatisfied with it the Indian Army stated that it planned to deploy up to 80 Prithvi-Is alongside Pakistani border (Burns, 1994). In reaction to prospects of the U.S. releasing F-16s to Pakistan, Indian officials warned the U.S. Deputy Secretary of State Strobe Talbott during his April 1994 visit that if the planes were released India would deploy missiles within striking distance of major Pakistani cities (Talbott, 2004, p. 30). However, during his visit to the U.S. in May, Prime Minister Narsimha Rao reportedly assured President Clinton that India would not deploy ballistic missiles in the near term (Perkovich, 1999, p. 347). The assurance meant little to Pakistan. In June, Pakistani Prime Minister Benazir Bhutto expressed concerns over Prithvi's development, pointing out that Pakistan was its only target (Shakoor et al., 1994, p. 7).

Three years later, in May 1997, Washington Post reported that India had moved less than 12 Prithvi-I missiles to Jalandhar near the Pakistani border (R. J. Smith, 1997). In response to the U.S. criticism India argued that the missiles had been relocated to a storage site and were not deployed. India further asserted that it had provided a prior notification the U.S. about the move. Later, India's then Prime Minister I.K. Gujral stated that the Indian Army had orchestrated the movement without his advance knowledge or approval and said he would

prevent any further shift of missiles toward the border (Cooper, 1997). Gujral's statement raises serious questions. If indeed Indian government had provided prior notification to the U.S., it would have been done so with an approval from the Prime Minister's Office, which would mean that Gujral had been aware and may have approved of Prithvi-Is' move to Jalandhar. In the other case, the claim that India had pre-notified the U.S. would be false.

Pakistan was visibly upset about the situation. Its then COAS declared that Pakistan may proceed with the development of its own indigenous missile program (Mian et al., 1998). Foreign Minister Sardar Assef Ahmad Ali also indicated that Pakistan would go ahead with indigenous missile production programme if India deployed Prithvi missile on the borders (Mirza, 2009, p. 453). However, two contrasting viewpoints exist over the threat posed by Prithvi's deployment to Pakistan. According to Feroz Khan (2020), Prithvis' storing in Jalandhar did not pose an imminent threat. These first generation Prithvis were not only non-nuclear but also constrained in conventional role. Moreover, some U.S. officials believed that India had not deployed the requisite gear and personnel to make the missile operational (R. J. Smith, 1997). The 333 Missile Group, the missile's custodian, was stationed in Secunderabad in South India, which increased the time required for fully deploying and using these missiles (Narang, 2014, p. 97). In the end, deployment of these missiles in Jalandhar was more symbolic than of a military value.

On the other hand, Naeem Salik (2002a, pp. 48–49, interview with the author, 2020) argues that distinction between storage and deployment cannot be easily made, and as far as Pakistan was concerned Prithvis' "forward storage" constituted "forward deployment." Even though at 150km range the missile is a battlefield or tactical [counterforce] system in the Pakistani case it has 'strategic' [countervalue] implications as well due to Pakistan's lack of strategic depth, which puts some of its key strategic locations, including the capital Islamabad, in Prithvi's range. Pakistani experts also perceived that the reaction time to a pre-emptive launch of Prithvi would be "less than three minutes" (Mistry, 2003, p. 123). Considering these reason, Prithvi's deployment in Jalandhar was perceived as a major threat by some in Pakistan.

The reality of Pakistani threat perception probably lies in between these two views. While Prithvi's deployment may not have presented an imminent danger, as a capability it

was nevertheless a threat to contend with and its production and storing/deployment is likely to have factored into Pakistan's military planning. The question to ponder upon, however, is whether Prithvi's deployment effected Pakistani decision on missile acquisition? Some argue that Prithvi's introduction marked a 'qualitative change' in the strategic landscape of South Asia and that the missile's deployment advanced Islamabad's missile decisions (Mistry, 2003, p. 123). A closer look at the situation, however, presents a less straightforward answer than that.

Indian 'action' of Prithvi's deployment failed to entice a reciprocal 'reaction' from Pakistan. The hawks in India believed that Prithvi's deployment would compel Pakistan to finally reveal its Chinese origin M-11 missiles, which would then force the U.S. to sanction China (Perkovich, 1999, pp. 396–397). However, despite belligerent statements Pakistan did not react by revealing M-11 missiles or by flight-testing Hatf-I and II. Although, there were reports of Pakistan allegedly flight-testing a 600km-800km range missile, identified as Hatf-III, it turned out be erroneous. The confusion may have been caused by the Pakistani foreign office's confirmation of a test of 'rocket motor technology' in July ("Pakistan Confirms Test Firing Rocket but Gives No Details," 1997). While the test was only ground based it was nonetheless a significant as the engine in question was meant for Shaheen-I ballistic missile based on M-9's design (F. H. Khan, 2012, p. 240).

Although the evidence is scant, Prithvi's deployment nonetheless may have compelled Pakistan to accelerate its missile programme and the engine test may have been a part of it. Moreover, the event is likely to have played into the consideration of Ghauri's flight-test by Pakistan in 1998. Ghauri took its name from medieval Muslim ruler Shahabuddin Ghauri who achieved a decisive victory over Hindu ruler Prithviraj Chauhan, the eponymous of Prithvi missile. The naming politics symbolically positioned Ghauri against Prithvi missile and as a possible retort to Prithvi's deployment a year earlier.

6.1.3. Nuclear Tests, 1998

Only two months after coming to power the BJP government in India conducted five nuclear tests on 11th and 13th May 1998. In response Pakistan carried out its own series of nuclear tests on 28 and 30 May. On 27th May 1998, anticipating an Israeli, Indian or a joint

Indo-Israeli pre-emptive strike on its nuclear facilities, Pakistan allegedly deployed Ghauri mounted with nuclear warhead (Langewiesche, 2007, pp. 123–124; Rizvi, 2001; Tkacik, 2010).

On 30th May, A.Q. Khan claimed that Pakistan could mount a nuclear bomb on Ghauri in a matter of days if the prime minister asks (Naji, 1998). India had also reportedly activated its aircraft and missiles, bring the two neighbours close to a nuclear exchange (Langewiesche, 2007, pp. 123–124). Pakistani defensive measures taken during the nuclear test preparations created a perception in the U.S. that Pakistan was "reacting to false alarms" and creating instability. In contrast, neither Pakistan or India construed each other's defensive measures involving the [alleged] movement of nuclear forces or enhanced defences as an escalatory move (F. H. Khan et al., 2004, p. 19).

Much of the threats made during the period were mere rhetoric and the reliability of reports about the alleged missile deployments improbable given the state of missile capabilities in the region. India's only operational missile, Prithvi-I, was not yet known to have been modified for dual-use purpose, whereas the Pakistani Ghauri had failed its first and only flight-test at the point and was unlikely to have been cleared for operational use. Nevertheless, the nuclearization of South Asia played a significant role in bringing about a doctrinal shift in both India and Pakistan, swinging preference from aircraft to ballistic missiles as the primary nuclear weapons delivery vehicles and in the process initiating missile race in South Asia.

6.1.4. Kargil Conflict, 1999

Between 3rd May to 26th July 1999 a limited-scale military conflict broke out in the Kargil sector of the disputed Kashmir region between Pakistan and India. In July, Pakistani Prime Minister Nawaz Sharif travelled to the U.S. seeking mediation from President Clinton. The Sharif-Clinton meeting took place on 4th of July at Blair House with Clinton's advisor Bruce Riedel as the only other participant. On the eve of the Sharif's arrival the U.S. allegedly learned that Pakistan might be preparing its nuclear forces for deployment (Talbott, 2004, p. 161). According to Riedel (2009, pp. 139–140), Clinton pressed Sharif if he knew how advanced the threat of nuclear war really was? Did Sharif know his military was preparing their nuclear tipped missiles? Did Sharif order the Pakistani nuclear missile force to prepare for action?

Riedel recalls that Sharif seemed taken aback and said only that India was probably doing the same. Sharif also denied that he had ordered the preparation of their missile force. Talbott (2004, p. 167), later weighed in that Sharif "neither acknowledged nor seemed aware of anything like that on his own side." In the end, Sharif agreed to a unilateral withdrawal of troops.

While most observers from the U.S. subscribe to Riedel's account Pakistani and Indian policymakers and experts of the time are, however, dismissive of the claims that Kargil had a nuclear dimension (Chari et al., 2007, p. 136). According to General Musharraf (2006, pp. 97–98), prospect of nuclear war during the conflict was a "myth." He asserted that Pakistan's nuclear capability was not yet operational and talk of preparing for nuclear strikes is "preposterous." Salik (2020) and Feroz Khan (2020) assert that there was never a threat of conflict escalating into a full-scale conventional war, let alone a nuclear exchange. Across the border, India's then foreign minister Jaswant Singh (2007, pp. 193–194) similarly recalled that never at any stage was there a question of a full-scale war and that while India had information about Pakistani activity in the Tilla ranges, indicating that Pakistan might be operationalizing its nuclear missiles a nuclear angle to this conflict simply did not exist. However, Singh did not outright dismiss Riedel's account and terms it as authoritative confirmation by the U.S. "that Pakistan had indeed resorted to nuclear blackmail."

India's then Army Chief General V. P. Malik (2006, p. 378) likewise notes that other than one or two intelligence reports indicating that Pakistan Army personnel were noticed cleaning up artillery deployment areas and missile launch sites at the Tilla Ranges, there had been no specific reports that Pakistan Army was readying its nuclear arsenal. General Malik (2006, p. 403) adds that "jingoistic rhetoric apart, there was no credible evidence or threat that nuclear weapons would be used during the conflict." Unlike Singh, General Malik is sceptical of Riedel's account, arguing that if the U.S. had more information about the nuclear danger than the Indian intelligence agencies then President Clinton would have conveyed such a vital information to Prime Minister Vajpayee, who, in turn, would have told the three military service chiefs – which did not happen.

In over two decades since the conflict the allegations of Pakistan's deployment of nuclear-tipped missiles remain unsubstantiated and the alleged intelligence data has also not

been made public by the U.S. Thus, much of the impartial scholarship is left with speculations. Timothy Hoyt (2009, p. 159) speculates that "what probably occurred was that Pakistan dispersed its nuclear-capable missiles out of storage sites for defensive purposes – a development that could have been misinterpreted by intelligence agencies as an operational deployment." More recent literature and data collected for this research, however, indicate that the claims of Pakistan's nuclear weapons capability, particularly its nuclear capable ballistic missiles, not being operational and nuclear weapons not being deployed may hold credence. There are at least three reasons to believe that.

First, Pakistan had not yet formally promulgated its command and control (C^2) structure for nuclear weapons related decision-making and for operationalising nuclear weapons delivery vehicles, particularly ballistic missiles – although, work on establishing SPD as a secretariat to the pending apex decision-making body, the National Command Authority (NCA), was underway. The absence of a C^2 System is also highlighted by General Malik (2006, p. 378) to question the credibility of the allegations of nuclear deployment by Pakistan. Since Pakistan Army is not known to have constituted and operationalised the ASFC at the time it is unlikely to have sought operational custody of any of the ballistic missiles. This, however, does not mean that they did not exercise sufficient control over the nuclear and missile programmes.

Second, according to Feroz Khan (2012, p. 315, 2020), on 30th June 1999, at the peak of the conflict, DG SPD General Kidwai, the man in charge of Pakistan's nuclear assets, was in Geneva holding a meeting with the U.S. experts to discuss "the next phase of Pakistan's minimum deterrence posture and the progress on the Pakistani Strategic Restraint Regime proposal." Khan asserts that had there been a need to operationalise nuclear missiles General Kidwai would have been called back. Khan recalls General Kidwai himself emphasising this fact when queried on the alleged nuclear preparations during his 2006 conference with a research team from the U.S. Naval Postgraduate School. On his part, General (R) Kidwai, in his interview with this researcher, categorically refuted the reports of the alleged missile deployments by Pakistan during the conflict. He asserted that Pakistan did not try to deploy any kind of nuclear device, let alone [Ghauri] missiles. He stated that he was the DG SPD then

and there is nobody else who would have known better than him whether General Musharraf or anybody else would have wanted to deploy [Ghauri] missiles.

Third, the only missiles that were declared to be nuclear capable at the time were Ghauri and Shaheen-I. Up until then Ghauri had been tested only twice and had failed both the times. Even if it could somehow be readied for use the fact remains that at the time it could only carry a conventional warhead and couldn't have achieved much in the mountains of Kargil (Salik, 2020). Shaheen-I, on the other hand, had been flight-tested with a relative success but had been done so only once and that too only a couple of months prior to the conflict. Both missiles would not achieve operational status until 2003, some four years after the Kargil Conflict (P. I. Cheema, 2004; Kristensen & Norris, 2015b).

Unlike India at the time, the U.S. had spy satellites and had been policing Pakistan's missile transactions with China and North Korea. Given these facts questions arise about the credibility and intent behind the assessments of the alleged intelligence data. Was the data misinterpreted or exaggerated or even fabricated to arm twist Pakistan into withdrawing troops from Kargil? As recalled by General Durrani (Dulat et al., 2018, p. 54; 2018, pp. 73 and 317) misinterpretation of intelligence data by the U.S. was not unprecedented in Pakistan's experience as the U.S. had previously done so in the 1990 crisis when it misconstrued cranes and trucks carrying construction pipes for missiles. In Kargil's case, General (R) Kidwai opined that the U.S. probably interpreted large truck activity at the Kirana Ammunition Depot, near Sargodha Air Force Base, as a nuclear activity, since the western sources believed the location housed the China supplied missiles (F. H. Khan, 2012, p. 315).

On the other hand, journalist Nasim Zehra' (2018, p. 258) writing suggests that the intelligence data was likely exaggerated by the Clinton Administration's core group of experts, which included Riedel and Talbott. Other officials from the State Department and the intelligence wing of its South Asian Bureau, the U.S. Embassy in Pakistan, the CENTCOM, the DOD, and the CIA were less convinced about the nuclear danger. The divergence and exaggeration in data interpretation resulted from the fact that the core group of experts interpreted the data subjectively. Zehra quotes one official stating, "the criteria set for checking facts were pretty low. Nuclear saints examine the situation almost subjectively...they are willing to see evil and believe evil. Nuclear was the sacred grail...even

a hint of nuclear would get them riled up. On the nuclear issue there was immense room for interpretation, so it depends on who the interpreters were."

Some experts also believe that Clinton and his experts exploited and perhaps even invented some of the intelligence details to coerce Nawaz Sharif into withdrawing troops. General (R) Kidwai opined to the researcher that the alleged intelligence data was possibly planted by Riedel and employed as a scare tactic to scare Prime Minister Sharif and sow doubts in his mind that Pakistan Army was doing something behind his back. Similarly, Feroz Khan (2020), stated that the alleged nuclear dimension was a drama by Talbott, Riedel, and Clinton to pressurise Sharif. By Talbott's (2004, p. 162) own confession Clinton had stated that he wanted to use the information "to scare the hell out of Sharif."

Rationales for singling out Pakistan were simple. *First*, Pakistan was the aggressor in the conflict. *Second*, Clinton would score a much-needed foreign policy point after having failed at preventing India and Pakistan from conducting nuclear tests. *Third*, Clinton Administration had wanted to foster strategic relationship with democratic and economically emergent India, rather than with Pakistan (Dumbrell, 2009, p. 132). The fact that the U.S. somehow overlooked – or chose to overlook – Indian nuclear preparations during the conflict reinforced this belief in Pakistan. According to Indian journalist Raj Chengappa (2000, p. 437), India activated its three types of nuclear delivery vehicles and kept them in what is known as 'Readiness State-3' where some nuclear bombs would be kept ready to be mated with the delivery vehicle at short notice. IAF was asked to keep its Mirage fighters on standby and DRDO scientists were relocated to Prithvi deployment sites. At least four Prithvi missile were readied for a possible nuclear strike. Agni missile was also moved to the Western front and kept in a state of readiness and a trajectory was worked out so that the two stages that are detached after burnout did not fall on Indian territory and hurt anyone.

It should be recalled that India had first flight-tested Agni-II only 22 days before the conflict. The missile's serial production was announced in March 2002 after which the missile was slated for induction ("Agni-II Enters Production Phase," 2002). This should then rule out Agni-II's deployment during the conflict. Besides India had conceived the missile as China-specific and found its 2000km-2200km range too long to target Pakistan at the time. On the other hand, the Pakistan-specific 700km range Agni-I was conceived after and as a result of

the conflict. This leaves Agni-TD as the only missile from Agni series available for deployment. To allay international criticism India had on multiple occasions qualified Agni-TD as mere 'experimental missile' not intended for operational use in either conventional or nuclear role. Whether this was a duplicity on India's part, or a nuclear bluff remains unproven. None of the sides involved in the conflict have, however, raised this issue. Although several Indian officials dismissed Chengappa's account as journalistic view the dispersal and relocation of missile assets was subsequently confirmed by General Malik (2006, p. 378). He, however, does not specifically mention Agni's deployment.

Clinton Administration's disinclination towards getting involved in the Kashmir dispute and reprimanding Pakistan for instigating the conflict did indeed lead to a thaw in the Indo-U.S. relationship and helped remove the negative perceptions of the U.S. in India (Riedel, 2009, pp. 142–143). India had traditionally protested third-party involvements in the region, but during and after the Kargil Conflict made an exception for the U.S. because of its India-favourable stance. In Pakistan, however, Clinton Administration did an irreparable damage to an already fragile civil-military relations and drove a wedge between Prime Minister Sharif and COAS General Musharraf.

Fear of civil-military tension had, in fact, beset the Clinton Administration when dealing with Sharif. Alongside the objective of inducing a Pakistani withdrawal the Clinton Administration had also set an incompatible goal of increasing Sharif's political capital but just enough for him to go home and give the necessary orders to General Musharraf to withdraw troops (Talbott, 2004, p. 162). It is difficult to gauge how much the event factored into the eventual demise of Sharif's government in the military coup on 12th October, which put General Musharraf in power. However, in his memoir General Musharraf (2006, pp. 86 and 163) expressed his disdain for what transpired at Blair House, calling it "Nawaz Sharif's sudden capitulation before President Bill Clinton." Sharif's political rival Benazir Bhutto (2008, p. 242) believed that the Kargil conflict ultimately resulted in a military coup against him.

Outside of the political intrigues there remains yet another possibility that while Pakistan did not have operational nuclear capable missiles it nevertheless undertook defensive measures involving movement of certain military assets that could be interpreted as readying of nuclear weapons. These measures may have involved moving some of the M-

series missiles out of their storage in Sargodha or No-dongs in Kahuta. Although these missiles were only conventionally armed, they could nevertheless serve as instruments of 'nuclear signalling.' It is also possible that Pakistan Army may have prepared these missiles for conventional deep strikes to compensate for the lack of participation from PAF. However, no evidence is available to corroborate these speculations.

However, as fears of possible Indian escalation grew, Pakistan had resorted to nuclear signalling during the conflict. Pakistani foreign secretary Shamshad Ahmed warned India that Pakistan could use "any weapon" to defend its territorial integrity (Hoyt, 2009, p. 156). Possibly at the behest of the government or the Army the Pakistani media touted that nuclear capable ballistic missiles for possible deployment were being readied. One report claimed that the Prime Minister had been told that deployment of short and long-range missiles with 'extremely effective warheads' had been completed (Gill, 2009, p. 112). Given Sharif's bewilderment at the Blair House meeting clearly this was not the case. It is also unknown if this report factored into the U.S.' assessment. Pakistani officials and scientists also publicised that work on more sophisticated and longer-range Ghauri-III and Shaheen-II was progressing ("Pakistan Developing New Longer Range Ballistic Missile: Report," 1999; "Work Reportedly in Progress on Pakistan's 3,000-Km Ghauri Missile," 1999).

Several analysts believe that Pakistani nuclear rhetoric – aided by the possible defensive measures – succeeded in deterring India. Some U.S. officials were concerned that India did not exhibit sufficient respect and understanding for the capabilities of the Pakistani missile programme and might therefore be inclined to try pre-emption of the Pakistani nuclear capability in the expectation that Pakistan would be unable to retaliate decisively (R. W. Jones & McMillan, 2009, p. 361). Indeed, the dominant hawkish voices in India disregarded Pakistan's nuclear and missile capabilities and recommended the government lift the restraints on Indian Army and IAF to conduct escalatory operations.

The government, in the end, clarified that if such a course of action became militarily necessary, the Cabinet Committee on Security would consider it. In reality, Prime Minister Vajpayee was seriously concerned about a Pakistani nuclear strike had India escalated the war and desisted from escalating the limited conflict into a full-scale war (Sood & Sawhney, 2003, pp. 70–71). Pakistan's nuclear capability was no bluff. Nuclear capable ballistic missiles

may not yet have been operational, but India had no way of verifying that and thus the deterrent effect prevailed. Besides, Pakistan retained the capacity to drop nuclear bombs with its aircraft.

In terms of impact on strategic weapons acquisition the conflict is believed to have resulted in Pakistan and India ramping up production of nuclear weapons and missile systems (Lavoy, 2009, p. 22). Having felt falsely accused and misunderstood, Pakistan resolved to ensure that its conventional and nuclear forces were prepared for the next crisis (F. H. Khan, 2011, p. 133), which incidentally would take place in 2001-2002. Pakistan quickly installed a formal C^2 system in 2000 under the rubric of NCA, incorporating SPD as its secretariat and tri-services Strategic Force Commands for taking custody of and eventually deploying and using the nuclear delivery vehicles like missile systems.

Measures taken by Pakistan after the Kargil Conflict were a logical course of actions, but no immediate discernible impact has been observed on Pakistan's decision in terms of choice of missile systems. The state of missile technology in Pakistan at the time possibly did not immediately provide room for qualitative innovation beyond what was already in the pipeline, i.e., solid-fuel Shaheen-I, Shaheen-II, and Ghaznavi and liquid-fuel Ghauri missiles. On the other hand, the conflict made India realise that in its quest for technological prestige and aspiration for catching up with China it had neglected building a more capable Pakistan-specific missile. Prithvi-I was inadequate and vulnerable, whereas Agni-II was an overkill weapon system against Pakistan at the time. India then quickly undertook the development of 700km Agni-I, which than factored into Pakistan military equation.

6.1.5. Twin Peaks Crisis, 2001-2002

On December 13th December 2001, militants attacked the Indian parliament. India blamed Pakistan and launched *Operation Parakram*, involving large-scale military mobilisation alongside the Pakistani border. On the same day India conducted the flight-test of 250km Prithvi-II. The test, however, may have been pre-scheduled for the date. Pakistan responded by undertaking a large-scale military mobilisation of its own, bring the two forces to an eyeball-to-eyeball standoff. Much like the Kargil Conflict there was potential for escalation as the two sides issued provocative statements and carried out missile flight-tests,

which aggravated international fears of an impending nuclear disaster (Chari et al., 2007, p. 173).

In late December Indian Defence Minister George Fernandes declared that “missile systems [Prithvi-I] are in position” (“India’s Missile System `in Position’: Fernandes,” 2001). On its part, Pakistan reportedly responded by deploying Hatf-I and Hatf-II SRBMs (Chari et al., 2007, p. 173). Going by the deliberations in this thesis, the two missiles were not nuclear capable and were suspected to have been discarded by the time crisis had started. ‘Hatf-II’ designation was rolled over to a new SRBM called Abdali, which would make its debut later during the crisis.

On 25th January 2002, India test-fired Pakistan-specific 700km Agni-I. Indian Ministry of External Affairs spokeswoman Nirupama Rao stated that “the timing was determined solely by technical factors,'' and that “we do not view missile tests as political messages” (Dugger, 2002). Pakistani officials thought otherwise and condemned the test’s timing. Foreign Minister Abdus Sattar termed the test as “unwarranted and unwise” for being conducted at a time of heightened tension. Foreign Office Spokesman Aziz Ahmad Khan said that Pakistan favoured a policy of restraint in the region and but also stated that Pakistan intended to test-fire a series of missiles when it was technically required (Mirza, 2009, p. 588).

Instead, it was India that ended up carrying out series of missile tests and delegated the command over operational missiles (Prithvi-I) to the military. On 30th January it flight-tested Trishul SAM. A day later it was reported that India had handed control of its missiles on the borders to the military, but on condition they were armed solely with conventional warheads (“India Ridicules Pakistan and Warns Troops, Missiles Will Hold Border,” 2002). On 5th March India flight-tested Akash MRSAM. On 28th April, India conducted flight-test of BrahMos cruise missile. Although this was the second flight-test of BrahMos, as a supersonic cruise missile it was an ‘innovation’ in the region whose introduction Pakistan argued would “…aggravate the existing balance in the region and further encourage India’s hegemonic designs” (Chari et al., 2007).

On 14th May, the crisis reached its second peak when another militant attack took place, this time on the Indian Army’s camp at Kaluchak in Kashmir. India thereafter completed

the last preparations for launching a large-scale strike against Pakistan (Z. Davis, 2011, p. 12). As the prospects of Indian offensive grew President-General Musharraf and other Pakistani officials began issuing warnings to India that Pakistan might use nuclear weapons if it deemed its existence to be threatened. At the end of May Pakistan carried out series missiles tests. On 25th Pakistan launched Ghauri, followed by launches of Ghaznavi and Abdali on 26th and 28th respectively. At the conclusion of the launches President Musharraf stated:

> "We were compelled to show then, in May 1998 that we were not bluffing and in May 2002, we were compelled to show that we do not bluff ... By testing with outstanding success the delivery systems of our strategic capability, these men validated the reliability, accuracy, and the deterrence value of Pakistan's premier surface-to-surface ballistic missile systems of the *Hatf* series, namely—*Ghauri, Ghaznavi, and Abdali* ... [we] need to ensure that the three basic ingredients of deterrence—capability, credibility, and resolve—never got compromised" (F. H. Khan, 2012, p. 350; D. Smith, 2011, p. 201).

Incendiary statements accompanied with missile launches from both sides were means of 'nuclear signalling,' a way for the leadership to demonstrate that they had the political will and military means to escalate the crisis, even up to the level of nuclear war. But as the international criticism grew both sides downplayed the intent of their respective rhetoric and missile tests, reassuring the international community that the tests were routine and part of their respective ongoing missile developments (Chari et al., 2007, p. 174). However, since neither side was able or willing to defuse the tension, these reassurances failed to convince external observers. Under intense diplomatic pressure from the U.S. both Pakistan and India eventually buckled and stepped back from the brinkmanship on 10th June 2002.

Much as in the case of Kargil Conflict, Western experts believe nuclear tipped missiles were deployed by both sides, which both Indian and Pakistani leadership denied was the case. Indian political and military leadership suggested that the risk of nuclear escalation was perceived to be minimal given that there were no reports of Pakistan mating its nuclear warheads with the delivery systems (Fitzpatrick, 2014, pp. 61–62). In an interview on 4th June 2002, President Musharraf said, "never in the history of Pakistan has a nuclear arsenal ever

been deployed, never even the missiles … deployed" (F. H. Khan, 2012, p. 354). In another interview with the Japanese newspaper Mainichi Shimbun on 26th July 2017, when asked whether he had ordered that missiles be equipped with nuclear warheads and put into firing position, General Musharraf said, "we didn't do that and we don't think India also did that, thank God." ("Interview: Ex-Pakistani Pres. Musharraf Mulled Using Nukes Against India After 2001 Attack," 2017).

Pakistani military personnel interviewed for this research also insisted that no nuclear preparations were undertaken, and the missile flight-tests were also not a tit-for-tat response to India's flight-tests. General (R) Kidwai explained to this researcher that the ballistic missile flight-tests in May 2002 were conducted for the purpose of signalling. He added that the concerned missiles were required to be tested for technical validation anyway, but the flight-tests could have waited. However, as Pakistan faced a persistent threat from the Indian military deployment during Operation Parakram, he suggested to President-General Musharraf and CJSC General Aziz Khan during a meeting held at the Joint Staff Headquarters that Pakistan needed to conduct successive missile flight-tests within one week to send a message across to India. After a short debate the flight-tests were approved and conducted in a span of four days.

Pakistan may not have deployed nuclear forces, but it had operationalised its nuclear deterrence by the time of the crisis (F. H. Khan, 2020). By 2000, Pakistan had installed NCA to streamline decision-making on nuclear deployments and eventual use. It did not adopt a formal nuclear doctrine but kept itself open to *first use* option since its strategic weapons were intended to deter Indian conventional aggression in the first instance. According to Feroz Khan (2012, p. 354), during the conflict "Pakistan had established its air and land nuclear forces and created ballistic missile units." Although, it would still be a year before the newly constituted ASFC would take operational custody of Ghauri and Shaheen-I missiles, Pakistan is nevertheless likely to have few operable dual-use ballistic missiles available on demand. In the Mainichi Shimbun interview President-General Musharraf stated it would have taken two days for Pakistan [and India] to prepare their missiles, indicating that few ballistic missiles may indeed have been in the inventory.

Indian leadership called Pakistani warnings a 'bluff,' but one they were reluctant to call. According to Mark Fitzpatrick (2014, p. 63), had India gone for limited conventional strikes let alone a full-scale war the crisis could have escalated into a nuclear exchange, and that Pakistani nuclear arsenal may have succeeded in deterring India from using conventional force against Pakistan. General (R) Kidwai (2022) asserted that that the May 2002 missile flight-tests got the message across and served their purpose – i.e., deter India. Feroz Khan (2012, p. 353), states that "nuclear weapons ensured Pakistan's national sovereignty, prevented bullying by India, and deterred a physical invasion." In testing medium and short-range missiles Pakistan might also have intended to signal that it was willing to respond to both limited and full-scale conventional strikes with nuclear weapons.

In the Mainichi Shimbun interview President-General Musharraf confessed that there were instances where he contemplated using nuclear weapons against India but desisted because of the fear of retaliation. This showed that the deterrence prevailed both ways. The crisis, however, also highlighted deficiencies in Pakistan's nuclear deterrence. Nuclear weapons may have deterred India from moving forward with a conventional attack, but it did not prevent its large military mobilisation at the border and India's retreat from the brink came because of international pressure. Pakistan realised that India is unlikely to be always deterred from using its conventional superiority (F. H. Khan, 2012, p. 353). India's large geographic displacement and numerical conventional and nuclear military superiority provided it a cushion to absorb Pakistani nuclear *first use* and continue with the conventional onslaught or destroy Pakistan with its nuclear weapons.

This profound realisation is perhaps the product of Indian leadership's issuing of existential threats to Pakistan. During the second peak Indian leadership threatened to wipe out Pakistan if it resorted to nuclear *first use*. Indian Defence Minister George Fernandes warned, "we could take a strike, survive, and then hit back. Pakistan would be finished." President of the ruling BJP, Jana Krishnamurthy, similar warned that if Pakistan used nuclear weapons, "its existence itself would be wiped out of the world map." Indian Army Chief S. Padmanabhan weighed in by stating, "the perpetrator of that particular outrange shall be punished so severely that their continuation thereafter in any form will be doubtful" (Krepon, 2011).

Michael Krepon (2011), argues that these messages may have strengthened the resolve of Pakistan's "nuclear requirement-setters" not to be deterred. He explained that Pakistani decisionmakers "seem to be acquiring the capabilities to destroy India as a functioning society in the event of uncontrolled escalation on the subcontinent. Given the number of major Indian cities, Pakistan's nuclear requirements could be enlarged based on this criterion alone. The stewards of Pakistan's nuclear arsenal claim that their requirements have been fixed and minimal. My sense is that they have actually risen after crises with India, after the U.S.-India civil nuclear energy deal, and in the context of growing Indian conventional capabilities."

Pakistan's Credible Minimum Deterrence (CMD) posture has indeed taken a more elastic approach as opposed to a fixed approach advocated by Washington. The 'minimality' rises in proportion to the growth of India's military power. Pakistani strategic weapons programmes have thus seen a quantitative and qualitative expansion. Although the quantitative aspects, such as number of warheads and delivery vehicles, remain shrouded in secrecy, outside observer tend to identify Pakistani nuclear programme as the "fastest growing" in the world. Pakistani officials have chosen neither to validate nor dismiss this assertion.

However, in terms of missile capability the policy or the overarching objective had already been set. General (R) Kidwai (2022) explained that his vision was to acquire ranges that could cover India completely, and that India should have no place to hide – or deploy – its missiles away from the Pakistani reach. The policy is also reinforced by General Musharraf who had stated that Pakistan should have 'enough missile capacity to reach anywhere in India and destroy a few cities, if required' (Tertrais, 2012, p. 5). Flight-tests of 2750km Shaheen-III in 2015 achieved this objective. Over the years, as the Pakistani nuclear arsenal expanded the list of targets may also have increased from 'few' to 'many.'

The crisis also made India realise that the prospects of full-scale wars in nuclearised South Asia were now severely constrained. This led India to adopt alternative approach to warfighting – a limited scale or low intensity conflict – which it perceives will be below Pakistan's nuclear thresholds. In fact, based on the lessons learned from the Kargil conflict, India had been articulating such a plan since 2000 when George Fernandes announced a

doctrine of limited war under a nuclear umbrella (F. H. Khan, 2009, p. 73). In 2004, India introduced the infamous Cold Start Doctrine, a fast campaign with limited objectives: capturing territory up to 50–80 km inside Pakistan, but without months of mobilisation—leaving no time for Pakistan or the international community to react (Tertrais, 2012, pp. 15–16).

Pakistan, however, perceives Cold Start any anything but limited. In response Pakistan has lowered its nuclear thresholds and diversified its warheads and missile programme, leading to the development of 60km-70km range Hatf-IX Nasr BRBM/TNW. Pakistani behaviour shows that states could turn to innovation in weapons technology in the face of adversary's innovation of offensive military doctrine. What, however, remains unclear is the impact of having a TNW on Pakistan's own nuclear posture. Most outside observers are worried that Pakistan would pre-delegate the launch authority for Nasr to field commanders during a conflict, which may increase the chances of nuclear war. Pakistan insists that there is no pre-delegation of authority and that all its nuclear assets are under a centralised control of NCA.

6.2. Technological Innovations

Despite vexed causal relationship the Indian ballistic missile programme has nevertheless been an important consideration in the Pakistani dual-track ballistic missile programme. Subsequent advancements in the Indian programme also pose a definite security challenge for Pakistan. However, new developments accompanied with advancements and improvements in accuracy, range, and payload in India's ballistic missiles do not appear to have had profound impact on the direction and choices of the Pakistani dual-track programme. According to Evangelista (1986, p. 1), while improvements like accuracy and destructiveness of missiles "may contribute to military effectiveness in a limited sense, they may not enhance overall security." On the flip, it may be argued that such improvements may not also enhance the pre-existing weapons capability related concerns and threat perceptions for the adversary.

From Pakistani perspective, it could be argued, that the Indian ballistic missiles have had, almost from the beginning, the requisite range, accuracy, and payload to cover and

destroy much of Pakistan and its forces in a nuclear war. A similar capacity was also available with aircraft nuclear delivery option. Improvements and advancements in its ballistic missiles only enable India to perform the same task more efficiently and incur no radical qualitative change in the Pakistani strategic assessments. Thus, Pakistan's dual-track ballistic missile programme has, for the most part, followed a trajectory independent of the developments and advancements in the Indian ballistic missile programme. India's development of longer-range China-specific IRBMs and further ambitions to develop ICBMs, have not had a discernible spill over effect on Pakistan's missile choices, as some observers predicted would be the case.

In qualitative terms, the overall objective of the Pakistani ballistic missile programme has emerged not to match India missile-for-missile but to extend the ranges and payload to cover India in its entirety. This was corroborated to the researcher by General (R) Kidwai. He explained that as the DG SPD his goal in missile development was to acquire complete coverage of the Indian landmass, which included its vast Eastern dimensions all the way to Calcutta and beyond, across Bangladesh to Assam, Tripura, etc, its Southern dimensions just short of Sri Lanka, and also further East to its archipelago of Andaman and Nicobar Islands in the Bay of Bengal, which gives them geographic depth for a strategic [missile] base.

The introduction of the 2200km-2500km Shaheen-II in 2004 partially satisfied this requirement as the missile could target the entire mainland-India. Whereas the subsequent development of 2750km Shaheen-III brought the Andaman and Nicobar Islands into its folds. In another interview, General (R) Kidwai asserted Pakistan is not expected to go beyond this range as it comprehensively covers lands area that India might think of putting its weapons on ("A Conversation Gen. Khalid Kidwai," 2015; "No PR-61/2015-ISPR," 2015).

Pakistan has, however, reacted differently to offensive and defensive 'technological innovations.' Military technological innovation introduces a new dimension to the relationship between one's own forces and the military organisation of the enemy, a qualitative technological one (Rosen, 1991, p. 40). BrahMos supersonic cruise missile and its BMD/ABM programme are two standout innovations by India. Although these innovations fall outside of the scope of this research, they are too important to be ignored from this discussion as they pose profound implications for the strategic landscape and deterrence

stability in South Asia and have affected Pakistani missile related decision-making and choices, leading Pakistan to seek out innovative solutions of its own both beyond and within its dual-track ballistic missile programme. In essence, technological innovations drive and define present trends in the South Asian arms race.

6.2.1. BrahMos Cruise Missiles

First flight-tested in June 2001, BrahMos has been developed jointly with Russia. Both countries clarified that the missile had a range of 280km and payload of 200kg. India further maintained that the missile was non-nuclear. These parameters were intended to ensure that the development did not violate the MTCR and thereby avoided potential U.S. sanctions against India and Russia. Pakistani experts not only viewed BrahMos, particularly the Russian collaboration in it, as a violation of the MTCR but also as potentially nuclear capable system with a standoff capability when launched from aircraft and naval ship or submarine, which would augment its range deficiency to strike deep inside Pakistan (N. A. Salik, 2002a, p. 49). Pakistan, however, did not immediately reciprocate with missile tests of its own.

Pakistani apprehensions have recently been corroborated by a Russian official who stated that BrahMos has a range of 500km and is able to carry nuclear warhead, although India has not yet labelled it as dual-use system (Radyuhin, 2012). With India joining the MTCR in 2016 the range of the missile is now being propagated to be further increased to 400km, 600km, and 1400km, which could cover Pakistan in its entirety (Chaudhury & Pubby, 2018; Philip, 2021). India has further introduced air-launched and naval variants of the missile and plans to further develop hypersonic BrahMos-II in collaboration with Russia. India is also working on a nuclear capable cruise missile Nirbhay with a range of 800km-1000km.

6.2.2. Indian Ballistic Missile Defence Programme

Of all the missile developments by India its BMD/ABM programme perhaps ranks high on Pakistan's concerns. India's interest in acquiring a BMD/ABM system had been known since the 1990s. DRDO contemplated developing an advance ABM-capable version of Akash MRSAM in 1993-1994, but the Akash programme itself hit technical snag (Banuri, 2004, p. 195). In 1996 the Indian military and DRDO re-examined the requirements for a BMD system. Off-the-shelf solutions like the Russian S-300V air-defence system, which incorporated limited

ABM capability, was reportedly considered but no acquisition took place. In 1998, DRDO once again began exploring the possibilities for indigenous BMD/ABM system (Kanwal, 2017, p. 312). In 2001, President George W. Bush announced his intention to withdraw from the ABM Treaty of 1972 with Russia. To the surprise of many, India – which had previously opposed President Reagan's *Strategic Defence Initiative* during the Cold War – came out in support of Bush's decision. This, in part, opened doors for India to cogitate on acquiring American Patriot Advanced Capabilities-3 (PAC-3) ABM.

Reports of Indo-U.S. discussion on PAC-3 emerged in May 2002, just as India and Pakistan were reeling through the peak point of their border standoff. In May 2003, the issue was again brought up by Indian officials with the U.S. Deputy Secretary of State Richard Armitage, and in March 2005 with Secretary of State Condoleezza Rice during her visit to India (Nagappa, 2006, p. 50). In the end nothing came off it as India was pinning hopes on PAC-3 whereas the U.S. offered PAC-2 (N. A. Salik, 2009, p. 200). India also considered Israeli Arrow-2 ABM but failed to receive clearance from the U.S. whose technology was incorporated into the system. Although India failed to acquire complete BMD/ABM systems from foreign suppliers it nevertheless managed to acquire significant foreign assistance, particularly from Israel, for initiating an indigenous BMD programme (Ferguson & Macdonald, 2017, p. 13; Joeck, 2009, p. 56).

India has since showcased an indigenous two-tiered BMD system. In 2006, India tested Prithvi/Pradyumna Air Defence (PAD) exo-atmospheric missile interceptor, which is based on Prithvi SRBM. In 2007, India tested Advanced/Ashwin Air Defence (AAD) exo-atmospheric missile interceptor, which is based on Akash MRSAM, indicating that despite running into technical snags DRDO had kept at modifying the missile for developing an ABM. The missiles are assisted in their mission by long-range Swordfish radar, a locally produced variant of Israeli Green Pine radar. There have been reports of successful missile interception by both the systems, but the capability is not known to have cleared the testing phase let alone integration into Indian air defence network. India also seeks to acquire Russian S400 LRSAM/ABM system, possibly to augment the shortcomings of its indigenous BMD programme and as a stopgap solution until its indigenous BMD becomes operational, or

perhaps even completely overwrite the indigenous programme. The acquisition has, however, been deferred due to the U.S. pressure.

6.2.3. Impact on Pakistan's Missile Programme

The possibility of India acquiring a BMD/ABM system has long worried Pakistan. However, it was the prospect of Indo-U.S. cooperation on BMD, and potential deal on PAC-3, which exacerbated Pakistani insecurities (Fitzpatrick, 2014, p. 83). The likelihood of an Indian BMD now appeared real. At the heart of Pakistani fears also lay the perception that the U.S. would want to neutralise Pakistani ballistic missiles – as a contingency if Pakistani missile programme becomes a direct threat to the U.S. or its interest in the region – and one way about it is to enhance the Indian BMD/ABM programme through technology cooperation, a suggestion that is not too uncommon amongst some of the American thinkers (Markey, 2013, p. 212).

Pakistani nuclear weapons and ballistic missiles have counterbalanced India's conventional superiority and deterred India from escalating sub-conventional conflicts/crises into full-scale wars. A confirmation of this had also come from India's former army chief General Shankar Roychowdhury who, in the aftermath of the 2008 terrorist attack in Mumbai, confessed that Pakistan's nuclear threat deterred India from seriously considering conventional military strikes against it (Narang, 2009a, p. 38). But a BMD acquisition by India threatens to erode the deterrence value of Pakistani nuclear-tipped ballistic missiles and threat of their *first use* by giving India confidence, at least notionally, to reopen the option of conventional military operations against Pakistan without fear of retaliation.

BMD systems are inherently costly, and their efficacy remains deficient. In the India-Pakistan context, the reaction time required for such a system to calibrate its trajectory for an interception is so short – 4 to 6 minutes is the estimated time from launch to impact – that a successful 'kill' is deemed as a "technical impossibility" (Hoodbhoy, 2013a, p. 85). It is also reasonable to assume that given India's landmass its BMD/ABM system would not be able to provide coverage over the entire country. Notwithstanding the efficacy issues and technical challenges, the Indian government may, however, strategise an economised plan to deploy BMD/ABM in select strategic countervalue locations, such as its major civilian population and

economic hubs, which Pakistan is likely to target, and extend BMD/ABM umbrella over its military assets and forces as well, which might conceivably embolden it to execute its sub-conventional "Cold Start" military operations against Pakistan with only limited fear of nuclear repercussions (Z. Jaspal, 2011, p. 19; Sokolski, 2009, p. 10). In short, 'defensive' capability like BMD/ABM may enable India to enthusiastically contemplate 'offensive' conventional military actions – the very threat Pakistan's nuclear weapons seek to deter.

Furthermore, BMD/ABM is likely to complicate India's nuclear *no first use* (NFU) pledge by creating space for it to carry out a pre-emptive nuclear strike against Pakistan (N. A. Salik, 2019b, p. 168). In which case, the Pakistan retaliatory strikes would be significantly degraded by the Indian BMD (Z. Jaspal, 2011, p. 19). The concern is further exacerbated by India's ambitions to 'innovate' MIRVed ballistic missiles. According to Narang (2013, pp. 146–147), the combination of MIRVs and BMD could allow a state to start thinking about *first-strike* strategies that use multiple warheads to target an adversary's nuclear arsenal and then rely on BMD to intercept any residual assets which survive the disarming strike attempt. It is pertinent to add that number of policy influencers and former senior officials in India have advocated finding a way around the NFU pledge, leading some experts to believe that India could consider nuclear *first use* as a pre-emptive counterforce attack if it has reason to believe that Pakistan is preparing a first strike against it (Sanders-Zakre & Davenport, 2017).

Proponents of arms controls have criticised Indian BMD/ABM ambitions and the U.S. offer of BMD/ABM technology to India, warning that it would fuel the arms race as Pakistan may be forced to seek offensive capabilities. This indeed, has turned out to be the case. Pakistani officials began hinting at possible countermeasures they might have to undertake to address possible BMD acquisition by India. Khalid Banuri (2004, pp. 199–200), former Director Arms Control and Disarmament Affairs (ACDA) Directorate of the SPD, suggested number of measures and developments Pakistan could undertake to enhance its missile survivability. This included, amongst other things, introducing offensive innovations like cruise missiles and MIRVed warheads.

Partly in response to BrahMos and partly to India's BMD ambitions Pakistan immediately expedited cruise missile development with a plan to eventually create a triad of such missiles for land, air, and naval use (F. H. Khan, 2012, p. 247). In 2005, Pakistan flight-

tested Babur GLCM, which is touted to have terrain-hugging low-altitude flight capability for avoiding radar detection and thereby complicating the possibilities of intercepting it. After Babur's flight-test President Musharraf compared the missile to BrahMos, identifying Babur as qualitatively better. More important, however, was his corelating of the missile's development with India's potential BMD/ABM programme. Musharraf argued, "there was a talk of India getting the Patriot missile, (PAC-3) and there was a feeling that there is an imbalance of purchase of very advanced technology, weapons and Patriot missiles by India. Let me say this improves the balance further. That is the significance of Babur cruise missile we fired." (Varma, 2005). In addition to multiple variants of Babur GLCM, including Babur-IB with a reported range of 900km, Pakistan has further diversified its cruise missile inventory with ALCM and SLCM. In 2007, Pakistan flight-tested Ra'ad ALCM and its extended range variant Ra'ad-II in 2020.

Pakistan's flight-tests of shorter-range missile systems, including cruise missiles, outnumber the tests of its various MRBMs, despite the latter being its premier nuclear delivery vehicles. According to Adil Sultan (2021), the MRBMs account for about 28% of Pakistan's missile flight-tests while the rest have been of the SRBMs and cruise missiles. Similarly in India only 15% of the missile flight-tests have been that of the MRBMs and IRBMs. Sultan argues that these percentiles suggest that both countries have laid greater focus on the shorter-range missile systems that would be better suited for India-Pakistan confrontation. He also suggests that this may also be due to fact that short-range single-stage missiles are less challenging to design and develop than IRBM and ICBMs, which comprise two or more stages.

In certain class of ballistic missiles Pakistan appears at technological dead-end and may find cruise missiles as means to compensate for the shortcomings. For instance, Pakistani planners have envisioned a triad of nuclear forces. However, it may be at a technological and financial cul-de-sac in developing SLBM as well as nuclear powered submarine to launch them with. As of right now no evidence is available to suggest that Pakistan is or plans to undertake such exuberant military acquisitions. A technologically more feasible and cost-effective alternative would be nuclear-tipped cruise missiles capable of being launched from conventional submarines, and it is this course to sea-based nuclear deterrence that Pakistan

is pursing. This is manifested by Pakistan's development of Babur-III SLCM, which was first flight-test in 2017 ostensibly from Pakistan Navy's Agosta-90B conventional submarine.

Although tactical in their characteristics in a regional environment where the adversaries are in proximity or share borders, as in the case of Pakistan and India, cruise missiles have the capacity to complement operational and strategic levels of nuclear deterrence. Pakistan's various cruise missile types today appear to form a crucial component of its FSD posture that seeks to exercise deterrence at the three levels of warfare. This would suggest that cruise missiles now serve a greater purpose than just evading, degrading, or neutralising the Indian BMD/ABM systems. Although, if such missions are successfully executed by the cruise missiles, they could pave way for the strategic ballistic missiles to strike against targets with reduced probability of interception.

While Babur GLCM series can strike at counterforce and countervalue targets situated immediately across the border, Ra'ad ALCM series provides Pakistan with "greater strategic standoff" capability against targets on land and sea that are situated at relatively longer distances ("No PR-16/2016-ISPR," 2016). The nuclear strike mission against countervalue targets can be extended further if PAF can effectively utilise its airborne refuelling capability. At present PAF's Mirage-III/V and some of its JF-17 have the capability of being refuelled in the air from IL-78 tanker aircraft. The Mirage-III has been the testbed launch platform for the Pakistani ALCMs, however, they are likely to be soon replaced with newer aircraft like JF-17 or perhaps J-10C.

Babur-III SLCM, on the other hand, is aimed at providing Pakistan with a relatively inexpensive retaliatory or 'assured second strike' capability. Although Babur-III would not have the same flexibility as Ra'ad-I/Ra'ad-II for extending their standoff-ranges further inland the Pakistani conventional submarines equipped with AIP systems can nevertheless extend the reach of nuclear strike mission to India's major economic centres and naval bases like Mumbai and perhaps also Visakhapatnam that situated along the coastlines. Some of such targets are out of the reach even for the ALCMs.

The challenge for assigning operational or strategic nuclear strike role to cruise missiles for Pakistan does not merely lay in extending their ranges but also in miniaturising

the nuclear warhead and enhancing their explosive yield for a strategic effect. This could be achieved by using tritium as booster for the fission process. The slimmer frames of the Pakistani cruise missiles and Nasr TNW suggests that Pakistan has been able to miniaturise the warheads. However, questions remain on Pakistan's capacity for producing tritium. According to one study, however, Pakistan could have produced 690 grams of tritium by the end of 2020, which would be sufficient to boost over 100 weapons (G. S. Jones, 2021; Kristensen & Korda, 2021).

India's BMD ambition have also pushed Pakistan to implement innovations within its ballistic missile force, leading to the development of MIRVed Ababeel MRBM. Although the missile is based on now technologically matured solid-fuel Shaheen ballistic missiles, which form the core component of the dual-track ballistic missiles, its MIRV capability has not yet been properly demonstrated. Nevertheless, the offensive missile system could be capable swamping BMD network by launching multiple warheads, including dummies, and thereby complicating the interception probabilities.

Pakistan has not yet expressed any desire to induct defensive systems like BMD/ABM of its own. In fact, it propagates to oppose BMD as a matter of cautious policy (Banuri, 2004). However, such innovations cannot be rejected outright in the Pakistani case. Given its economic constraints and technical limitations Pakistan could invest in a limited theatre missile defence (TMD) capability if or when technology for it is made available either within the country or from the outside. This may be the viable course of action if India is indeed able to find a way around its NFU pledge, constitute a pre-emptive plan, and introduce MIRVs. One readily available asset to Pakistan is the Chinese HQ-9P high-to-medium air defence (HIMAD) system, which it inducted in October 2021. The system is reportedly comparable to the Russian S300 and the American PAC-2/3 systems and may be able to offer Pakistani military a limited BMD/ABM capability, including against cruise missiles ("Army Inducts HQ-9/P Air Defence System," 2021).

6.3. Ballistic Missile & Cooperative Peace Efforts in South Asia

Many arms race studies and models conclude that nations should pursue cooperative efforts to diminish or eliminate the negative aspects of arms races (Anderton, 1989, p. 348).

Moreover, cooperating with its adversary to reduce threats is also considered as an alternative to arms racing. The norm of cooperative efforts in the form of nuclear confidence-building measures (NCBMs) – a softer approach to more hard or structural arms controls – in South Asia predates the overt nuclearization of Pakistan and India in 1998. However, NCBMs concluded between the two countries are few and feeble, and their coming to being, in most cases, has resulted less from mutual realisation for peace and stability and more due to the U.S. pressure. Moreover, the NCBMs have failed to rouse the prospects for arms control in the region.

6.3.1. Pre-Notification of Ballistic Missile Flight-Tests

The best India and Pakistan have mustered in terms of missile related CBMs is the 'Agreement between India and Pakistan on Pre-Notification of Flight Testing of Ballistic Missiles.' The agreement was part of what is known as Lahore Declaration, a series of memorandums of understanding concluded by the democratically elected governments of Indian and Pakistani in February 1999. However, the Kargil Conflict in May and military coup in Pakistan in October put the dialogue process on the backburner. Breakthrough in the bilateral dialogue came with the Islamabad Accord in 2004, which paved for the formal signing of the agreement in October 2005. The agreement requires both the countries to:

- Provide each other with "no less than three days" of advance notice of a "five-day launch window" within which they intend to flight-test land or sea launched surface-to-surface ballistic missiles.

- Ensure that the test launch sites do not fall within 40 kms, and the tested missiles do not fall within 75 kms, of the International Boundary or the Line of Control (LoC), which forms the ceasefire line that dissects the disputed Kashmir region between the two countries.

- Ensure that the planned trajectory of the ballistic missile being flight-tested shall not cross the International Boundary or the LoC and maintain a horizontal distance of at least 40kms from the international boundary and the LoC.

The agreement draws inspiration from the 1988, U.S.-Soviet Ballistic Missile Launch Notification Agreement, which seeks to reduce "the risk of nuclear war as a result of misinterpretation, miscalculation, or accident." However, the precedence of pre-notification of missile flight-tests in South Asia predates the conclusion of the agreement. For instance, Pakistan is believed to have notified India of Ghauri's flight-test in April 1998. Given the close proximity and short missile flight-time between the two countries the pre-notification agreement is deemed valuable and has been consistently adhered to by the two states, even during the crisis periods (Joeck, 2009, p. 51). Both states notified each other of their respective ballistic missile flight-tests during the 2001-2002 standoff.

6.3.2. Unrequited NCBM and Arms Control Proposals

The pre-notification agreement, however, has no impeding or eliminating effect on the ballistic missile acquisition in South Asia nor does it intend on exercising such an impact. There are, however, arms control proposals offered by Pakistan both before and after the overt nuclear aimed at curtailing the missile race in South Asia. In 1993, Pakistan proposed a "zero missiles zone" for South Asia. The proposal was primarily made to placate the growing U.S. annoyance and policing over Pakistan's missile technology imports. Predictably, India rejected the proposal. In October 1998, Pakistan proposed a 'Strategic Restraint Regime' (SRR) in South Asia, comprising of series of measures for imposing restraints on nuclear, missile as well conventional weapons under a mutually agreed verifiable regime. On the missile issues the Pakistani SRR proposed (F. H. Khan, 2012, pp. 296–300):

- Nondeployment of ballistic missiles, including not mating nuclear-capable missiles with the delivery vehicles
- Mutually acceptable minimum ceiling of missile production and categories of missiles, as well as range/payload limit (2500km/1000kg) for the subcontinent
- ABM and SLBM free zone in South Asia

The Indian side politely walked away from the SRR, expressing its inability to discuss the suggestions until they had carefully evaluated and analysed the proposal (Salik, 2009, p. 249). The failure of SRR can, in part, be attributed to the fact that Pakistan and India hold conflicting views on the objectives of political, military, and nuclear peace-making in South

Asia. Where Pakistan insists on regional or dyadic solutions India prefers not to be coupled with Pakistan but with global players like China on such issues. On occasions when it has agreed to discuss bilateral measures with Pakistan it has insisted on discussing soft NCBMs only, ruling out discussions on any measures that put restraints on its conventional forces.

Pakistan, on the other hand, deems any peace effort that excludes discussion on conventional forces and on the outstanding bilateral disputes (i.e., Kashmir, Sir Creek, Siachen, and water sharing) as irrelevant. As the U.S. – the principal arbiter of South Asian peace process – began realigning itself with India by late 1990s it began mirroring Indian position on the SRR and accepted India's rejective stance on it (F. H. Khan, 2010). The U.S. found it unreasonable for Pakistan to propose 2500km range cap on missiles in South Asia, which sufficiently satisfied Pakistan's range requirements against India but restrained India's range requirements against China (F. H. Khan, 2020).

After lack of interest shown by India and the U.S. on SRR Pakistan also lost interest in the proposal (F. H. Khan, 2010). Pakistan, however, continued to suggest some nuclear and missile related initiatives to India on international forums. In January 2001, Pakistani Foreign Secretary Inam-Ul-Haq offered series of arrangements at the Conference on Disarmament (CD) in Geneva. These included:

- Not to deploy ballistic missiles
- Not to operationalise or weaponise nuclear-capable missiles systems
- Formalise the understanding on providing prior and adequate notification of flight tests of missiles
- Moratorium on the development, acquisition, or deployment of ABM systems

On 28th March 2002, Foreign Minister Abdul Sattar reemphasised upon these measures and suggested utilizing CD for discussing these issues (N. A. Salik, 2002a, p. 53). Only the pre-notification agreement has since been concluded while rest have gone unrequited. Nevertheless, both India and Pakistan unilaterally claim to voluntarily maintain warheads and delivery vehicles, including missiles, in undeployed, de-mated and de-altered state. This includes keeping the warheads and delivery vehicles geographically separated. These unilateral measures do not impede the unabated missile developments that have since taken

place in the region. Instead, the measures themselves face a threat of being undone by recent developments like that of SLBM and missile canisterisation by India and Babur-III SLCM by Pakistan. These systems may require warheads to be mounted on the missiles even during peace time.

6.3.3. Multilateral Challenge to CBMs

Historically India has insisted on addressing its outstanding issues with Pakistan bilaterally. In the 1960s, Z.A. Bhutto in Pakistan also began advocating bilateralism in Pakistan's foreign policy. In 1972, the two countries formally agreed to resolve their issues bilaterally. However, instead of paving way for a durable peace process bilateralism has become an impediment in India-Pakistan peace process. In response to Pakistan's support to Kashmir's freedom struggle, India has become obstinate to Pakistani overtures for dialogue and unenthusiastic on initiating the dialogue on its own part, all the while continuing to insist on bilateralism and rejecting third-party mediation. An exception, however, was made for the U.S. as mediator on nuclear and missiles CBMs immediately after South Asian overt nuclearization, primarily because of the changing stance of the Clinton Administration in favour of India, particularly during the Kargil Conflict.

It was on the encouragement from the U.S. that India resumed dialogue with Pakistan after their respective nuclear tests in 1998, which eventually led to the signing of Lahore MoU (S. Kidwai, 2001, p. 130). However, the subsequent U.S. Administrations have not only failed to ensure continuity of the dialogue, but their policies have served to inflate strategic weapons acquisition in the region. This is in part because of the waning U.S. neutrality in the region. During George W. Bush's presidency radical shift in the U.S. diplomatic and non-proliferation policies in South Asia began taking place. The U.S. de-hyphenated its relations with India and Pakistan ostensibly to create a balance through separation between the two. However, primacy was assigned to the U.S.-India relations at the expense of the U.S.-Pakistan relations.

To pursue 'strategic partnership' with India, with a view of containing China, the U.S. abandoned its non-proliferation policy towards the country by facilitating it with a waiver from the Nuclear Supplier's Group (NSG) and thereby paving way for the Indo-U.S. Nuclear

Deal in 2008. In doing so, the U.S. recognised India as a 'normal nuclear weapon' state but continued to view Pakistan as a nuclear pariah. Where the U.S. sought to broaden the scope of its strategic partnership with India through cooperation on BMD/ABM systems there it also adopted a narrow approach in its relations with Pakistan and cooperation was limited to the ongoing War on Terror. During the Obama presidency the U.S. further strengthened its strategic partnership with India and the relations with Pakistan were further relegated as top U.S. policymakers felt a personal animus toward Pakistan for its perceived double gaming in Afghanistan and support for the Afghan Taliban (Markey, 2013, p. 4).

The Bush and Obama Administrations also adopted a policy of becoming involved in the settlement of the Kashmir dispute – South Asia's nuclear flashpoint – only to the point acceptable to India, and that the issue would not be allowed to become a stumbling block in the progression of Indo-U.S. strategic partnership. According to Mario Carranza (2016, p. 131), this resulted in the U.S. passively acquiescing to India's boycott of any serious negotiation with Pakistan on the Kashmir issue. In a similar fashion, the U.S. has also acquiesced to India's rejection of dialogue on NCBMs. In fact, and as stated earlier, it has mirrored India's position as evinced by its rejection of the SRR. Instead of supporting proactive undertaking of nuclear and missile CBMs and RRMs, the U.S. has since limited its role to reactively managing India-Pakistan crisis and conflict events.

To say that the de-hyphenation of India and Pakistan and preferential treatment of India by the U.S. has been detrimental to regional and global non-proliferation prospects in South Asia would be an understatement. The prospects of Indo-U.S. cooperation on BMD/ABM systems, as discussed, fed into the Pakistani decision to diversify its missile inventory through acquisition of cruise missiles, and in reaction to the NSG waiver to India and the subsequent Indo-U.S. Nuclear Deal Pakistan began accelerating its fissile material production, worrying that the wavier, which provided India with access to foreign nuclear fuel supply for civilian nuclear reactors, would allow it to divert its domestic fuel/fissile material to weapons programmes and thereby widen the fissile material disparity between the two.

The U.S. further impinges on the prospects of nuclear and missile CBMs and RRMs and inflates arms competition in South Asia through its presence in the Asian 'strategic chain,' where its military power in Asia Pacific forces China to inflates its own, which then motivates

technological competition in India, which in turn forces Pakistan to recalibrate certain aspects of its strategic weapons programmes. Placed at the very end of it, Pakistan tends to take the brunt of intricacies arising from the strategic competitions within the strategic chain. Further complications arise from the regular interpolation of extra-regional players like Russia and North Korea in the strategic chain. The two countries have been qualitatively and quantitatively inflating their strategic arsenal in response to perceived military threats from the U.S. and have also served as benefactors for India and Pakistan, respectively, in their missile programmes.

The Indo-Russia missile cooperation has been a major concern for Pakistan much the same as China-Pakistan missile cooperation has been for India. However, the Russian factor seldom finds its way into South Asian strategic discourse. Despite its relevancy, Russia's ability to influence South Asian rivals, especially on the peace process, is minimal. In 2002, during the summit on 'Conference on Interaction and Confidence-Building Measures in Asia' held in Almaty, Kazakhstan, Russia offered to mediate between India and Pakistan, but no substantial proposals were made (M. A. Smith, 2004). The Russian offer also did not appear to have received any serious consideration from either country.

The inflation of strategic weapons acquisitions and deflation of nuclear and missile related CBMs and RRMs in South Asia due to the influences of multilateral nature perhaps require abandonment of bilateralism on nuclear and missile issues in the region in favour of multilateral or international solution. Although it would be hard press to circumvent India's obduracy on bilateralism, a platform comprising of concerned states and serious commitments from states like the U.S., China, and Russia, which serve as India's strategic benchmarks, may convince it actively participate in nuclear and missile related CBMs, RRMs, and arms control measures. A particular focus is perhaps required on BMD/ABM and BRBM/TNW systems, which are not merely a concern in South Asia but in the European and Asian Pacific theatre as well. However, the guarantee of success may depend on holistic approach toward resolving outstanding disputes in the concerned regions.

6.4. Conclusion

The U.S. sanctions in 1990 served as a key 'trigger' for Pakistan's dual-track ballistic missile programme but the intervening phenomena narrated in this chapter do reveal that India-centric security concerns have been paramount in sustaining and furthering the programme. The conflict and crisis events indicate that the nuclear capable ballistic missiles have played significant role in addressing Pakistan's India related security concerns. Ballistic missiles tests have been used by Pakistan, as well as India, as instruments of policy and diplomacy during conflict and crisis events, especially during and after South Asia's overt nuclearization. Not only these tests have been conducted for the purpose of 'nuclear signalling' but also to attract international diplomatic intervention for diffusing the tensions.

In his analysis of Pakistan and India's missile flight-tests, Narang (2009b, p. 360) argues that the leaders in the two countries have "delayed tests whose political costs far outstripped whatever technical benefits might accrue; and conversely, they have sometimes pushed for a test if they wanted to send a signal at a specific time." Narang's assessment appears to hold true in the Pakistani case. Pakistan opted to forgo testing or deploying its Chinese conventional ballistic missile in response to India's Prithvi deployment in 1997 as the potential political repercussions of such a move outweighed not just technical benefits but strategic as well. On the other hand, Pakistan chose to conduct missile tests during the heightened period of security concern in 2001-2002 when the threat of an Indian conventional attack appeared imminent. This pattern evinces that Pakistan is motivated primarily by India-centric security concerns in its missile development and flight-testing.

Overall, Pakistani nuclear weapons and dual-track ballistic missiles appear to have collectively and optimally served their ultimate purpose of 'deterring India from escalating conflict and crisis events into full-scale conventional wars,' even though the narratives surrounding the politics of their deployment remains controversial and unsubstantiated. For Pakistan nuclear weapons and ballistic missiles have offset India's conventional superiority. If they have not sufficiently raised the value of Pakistan's conventional strength, they have considerably lowered or constrained that of India's. In essence, a 'strategic equilibrium' or 'balance of terror,' albeit a delicate one, has been achieved by Pakistan.

Establishing and maintaining a 'balance of terror' in South Asia had, in fact, been one of the prime objectives for Pakistan in its pursuit of nuclear weapons capability from the start (Beg, 2021, p. 286). T.V. Paul (2005, p. 14) best captures India's predicament when he states, "with the acquisition of nuclear weapons, Pakistan believes that it has obtained a ''great equaliser'' at the strategic level, since its missiles can hit most parts of India. New Delhi's overall conventional superiority has thus been severely constrained in the event of a war. Its earlier strategic posture of deterrence by denial and deterrence by punishment (i.e., in response to an attack on Kashmir, India would escalate the conflict across Pakistan's vulnerable strategic underbelly in Punjab) may have become less plausible."

Narang (2009b, p. 330) makes another observation that as a state motivated primarily by security concerns Pakistan is "forced to keep pace with India's strategic weapons advances since it is the much weaker of the two powers." This research only finds this assessment as partially correct. The data in this chapter finds little to no linkages between Indian and Pakistani ballistic missile developments during the intervening periods, nor is there any evidence that the missile flight-tests during the conflict and crisis events were driven by desire to give a tit-for-tat response. In fact, published and interview data collected for this research suggests that some time in 1999 Pakistan had cautiously chosen to disengage from tit-for-tat missile test competition with India, further thinning the correlation between their respective ballistic missile programmes.

According to Salik (2020), the flight-test of Ghauri and Shaheen-I in April 1999 was conducted in a tit-for-tat fashion in reaction to the flight-test of Agni-II by India a week earlier. Thereafter, however, Pakistan took a deliberate policy decision not to respond to Indian tests. He explained that it was thought that such a behaviour would raise public expectations and whenever India would carry out a missile flight-test Pakistan would be expected to follow suit, and if it failed to respond it will demoralise the public. Thus, it was decided to conduct missile flight-tests when required for confirming technological parameters. Salik also added that Pakistan had become cognisant of the fact that missile flight-testing could send wrong signals and therefore an agreement on pre-notification of ballistic missile flight-test was also concluded with India.

General (R) Kidwai confirmed to the researcher that while the two or three missile flight-tests in 1998-1999 were indeed conducted in a tit-for-tat fashion in reaction to India's missile flight-test, thereafter he had personally introduced the policy of abandoning this reactionary pattern and to only conduct missile flight-test when required by the scientists for technical validation. He explained that Pakistan had enough confidence in its missile capability and therefore did not have any need to engage India in a tit-for-tat missile competition.

Pakistan's former Foreign Secretary and latter Foreign Minister Abdul Sattar (2010, p. 245), who served in the position during the 2001-2002 Standoff, explained Pakistani position on missile flight-test in his writing as, "conducted for validating the technology and for development and improving [of] accuracy," and that, "matching the adversary's test for test and missile for missile is neither necessary for the credibility of deterrence, nor is it affordable for Pakistan. Both theory and experience of other nuclear states lead to the same conclusion: sufficiency, not parity, is the precondition for the efficacy of deterrence."

Of course, the exception were the May 2002 tests. Popular perception found in the literature has erroneously perceive them to be motivated by then ongoing missile competition between India and Pakistan. Two factors, however, negate the competitive or tit-for-tat missile flight-test argument. *First*, the timing of the two countries' missile flight-tests indicates that Pakistan was not immediately compelled to reciprocate to Indian missile flight-tests. *Second*, as explicitly explained by General (R) Kidwai, the flight-tests were scheduled for a later date but were expedited on his request for nuclear signalling.

As stated earlier, Pakistani programme has moved forward on an independent trajectory. This observation is also made by Toby Dalton and Jacklyn Tandler (2012, p. 1), who conclude that the Indian and Pakistani nuclear programmes are largely decoupled and that there is little correlation between their missile testing behaviour contrary to what would be expected in a classic arms race. The two authors also suggest the developmental patterns in the Pakistani missile programme have further taken on a divergent path in terms of missile types and ranges, with Pakistan focusing on smaller tactical systems and India on long-range China-specific ballistic missiles. At the time the two authors' article was published this indeed appeared to be the case. However, Pakistan has since retraced its missile developmental steps to medium-range missile like Shaheen-III and Ababeel.

Nevertheless, it would not be erroneous to conclude that Pakistan and India are not engaged in ballistic missile 'arms race,' at least not in the sense the U.S. and the Soviets were (the competition that forms the basis of much of the theoretical explanations of post-WWII qualitative or technological arms race). Both Cold War superpowers were faced with similar odds in their dyadic strategic calculations. For instance, the shared geographic realities justified their mimicking of each other on ICBM development. India and Pakistan are, however, faced with different odds and thus the two states are pursuing different international goals and objectives in their missile programmes.

India appears set on mimicking the nuclear missile triad of the global powers like the U.S., Russia, and China for attaining global power status. Whereas Pakistan is attempting to offset its ground, air, and naval conventional forces inferiority, provide its nuclear forces with coverage over entire India, and to preserve the 'delicate balance of terror' that it has achieved against India. Pakistan's geographic and political realities do not dictate that it should mimic Indian ballistic missile programme or match missile for missile, particularly in ranges exceeding 2500km-3,000 Km. Overall, Pakistani nuclear and missile programmes aim to create what Pakistani officials call "Full Spectrum Deterrence," a posture that seeks to establish deterrence on strategic, operational, and tactical levels of warfare. The posture finds its basis in that of NATO. The dual-track missiles form the core component of strategic and operational levels, whereas the BRBM/TNW like Nasr and cruise missiles like Babur and Ra'ad form the tactical component.

Pakistan has, however, been forced to keep pace with military technological innovations like cruise missiles and BMD/ABM by India, and offensive sub-conventional military doctrines like the 'Cold Start,' which threaten to erode Pakistan's hard-fought nuclear balance of terror and deterrence against Indian conventional superiority and shift the balance in India's favour. As Hedley Bull (1977, pp. 119–120) explained, "the balance of terror is not created by the mere existence of nuclear weapons in the hands of two adversaries, nor does it persist automatically while these weapons continue to be available. In principle a relationship of mutual deterrence may be upset by one or both of two technological developments: the acquisition by one side or both of an effective defence of cities and populations against strategic nuclear attack; or the development by one side or both of an

effective means of disarming the other's strategic nuclear retaliatory forces before they are brought into action."

Thus, if India can successfully operationalise its BMD/ABM programme and implement its sub-conventional warfighting plans Pakistan can reasonably assume that an all-out war is not completely obsolete in the dyadic relationship. A clearer action-reaction is observed in this area in contrast to the supposed ballistic missile competition. Pakistan has therefore taken innovative measures of its own in the shape of cruise missiles, BRBM/TNW, and MIRVed ballistic missile to maintain the status quo in the 'delicate balance of terror' between the two states. In some of its innovative reactions Pakistan, in part, appears to be assisted by acquired experiences and knowledge of the other nuclear weapons states and Western scholarly writings. For instance, Pakistan's MIRV development in reaction to Indian ABM programme draws influence from the American MIRV development in reaction to the Soviet ABM programme.

Some experts conclude that some of these innovations have come as premature developments, with Pakistan not wanting to wait and see if India is indeed able to effectively implement its plans (Akhtar & Das, 2015). A fairer assessment, however, would be that Pakistani reactions to technological innovations and sub-conventional warfighting doctrine by India are 'anticipatory.' Some of Pakistan's proposed nuclear CBMs and arms control measures, such as the SRR, and the suggestion for imposing restraints on innovative developments like that of the BMD/ABM and SLBM were also anticipatory in nature and did appear to cater to Pakistan's genuine security concerns vis-à-vis India, which reinforces that the security factors have been the overarching considerations in Pakistan's strategic weapons programmes. Although lack of technical and financial resources to counter every radical qualitative innovation by India may be another reason.

According to Buzan and Herring (1998, p. 101), "when reactions become anticipatory, the state has, in effect, restructured itself internally on a long-term basis to deal with the arms dynamic. R&D laboratories work to push the frontiers of military technology ever forward. Arms production facilities are kept going with orders so as to maintain capacity, and over time (and along with other military facilities) they get absorbed into the budgetary and electoral processes of the state." The discussion that has been presented in this thesis thus far suggests

that Pakistan has internally restructured itself for strategic weapons development on a long-term basis. Heavy investments have been made to establish and expand missile R&D structures. The role, or lack of it, of these structures and of key decision-making institutions in invoking particular factors from the DSM in Pakistan ballistic missile acquisition is subject to discussion in the following chapter.

CHAPTER-7: DOMESTIC INTERVENING PHENOMENA

The fundamental focus of DSM is on the parochial interests and politics of state institution, organisations, or bureaucracies. The bureaucratic political perspective sees armament build-up as a continuing bureaucratic struggle for personal and organisational influence, the currency of which are decisions on money, men, weapons, and ideas (Gray, 1974, p. 290). The most oft cited bureaucracies or institutions exerting their narrow self-interests on weapons acquisition decision-making include the military research and development (R&D) establishments, the major producers of weapons systems, the military services that will operate the arms, and the political hierarchy (Farrell, 1997, p. 11; Glaser, 2000, p. 251).

An extremely conservative perspective of the DSM would uphold the autism theory; meaning that arms acquisitions result wholly from actors and factors internal to the state and not as a rational response to any external threat. In this explanation internal-domestic dynamic is a causal phenomenon in exclusivity. More later and liberal opinions, however, identify the domestic factors as 'intervening phenomena' that come into play when a state involved in a protracted conflict or arms rivalry internalises weapons programme to meet its military requirements for externalised threats. In their observation of the superpower arms race the proponents of the DSM did not downplay the significance of external state levels arms rivalry but argued that the process of the arms dynamic had become so deeply institutionalised within, that domestic factors largely supplanted the crude forms of action and reaction as the main engine of the arms dynamic (Buzan & Herring, 1998, p. 101).

Most arguments, particularly those supporting the complementary approach to studying arms dynamic, hold that the structures and institutions that a state creates to meet its military requirements and international goals subsequently develop interests of their own and have the political power to pursue these interests (Glaser, 2000, p. 257). Given hierarchical decision-making setup of states these structures and institutions often work in alliance with other institutions concerned with state's security to satisfy their narrow or parochial interests.

These arguments or generalisations have largely been based on observations made from the Cold War superpowers or major arms producers. As stated before, the relevancy of domestic factors in the case of less industrialised non-producer or part-producer states, particularly new nuclear weapon states, is less touched upon. However, Pakistan's ballistic missile programme provides a good example of how domestic factors could influence weapons acquisition decisions in the case of developing countries.

Going into this chapter the important query is why Pakistan committed itself to the technologically and politically volatile North Korean liquid-fuel No-dong? The matter becomes more curious when one realises that in the early 1990s, when Pakistan acquired the technology, it was still transitioning to a part-producer state, its resources were scarce, and it was facing sanctions from the U.S. Available literature, especially the works by Naeem Salik and Feroz Khan, set it out that the acquisition primarily resulted from domestic interests. However, the decision to embark on a ballistic missile programme and the acquisition of the more stable solid-fuel ballistic missiles are also not without their own domestic political intrigues. These are subject to elaboration in this chapter.

Scholars like Gray (1971, p. 73), insists that the studies into action-reaction triggers must give attention to the environment in which principal arms race states are engaged in. By that virtue, studies focusing on DSM should not merely be concerned with institutional actors but should also give due attention to the domestic political environment in which the arms race or arms acquisition decision-making is being made by the state actors. This should especially be considered in the case of secondary arms dynamic states like Pakistan where lopsided civil-military relations have impinged upon civilian governments' ability to assert themselves.

The following discussion thus begins with the overview of the domestic political environ of Pakistan between 1988 and 1999. The decade represents the tensest trends in the country's civil-military relations and oppositional politics, which has impinged upon the civilian government's ability to effectively regain control over the nuclear programme. This is followed by the discussion over the role, influence, and interests of the key institutions that were involved in the decision-making on ballistic missiles during this period. The chapter

further deliberates on Pakistan's C2 system, which it began establishing in 1999, and its role and impact on ballistic missile programme.

7.1. Domestic Political Environ & Strategic Decision-Making: 1988-1999

Pakistan's domestic political environ has had a long history of direct and indirect military interventions in the governmental affairs. Between 1958 and 2008, Pakistan has been governed by four different military dictators. Naturally, this has entrenched the military in Pakistan power politics. Even though the Prime Minister is the *de jure* chief executive of the country the popular view holds that their right to exercise authority or set the policy tone on matters of strategic concern is impinged by the lopsided civil-military relations in Pakistan. By and large, the foreign and security policy issues, and decision-making relating to the strategic weapons programmes are military's exclusive preserve, even when a democratically elected government is in power (Rizvi, 2000, p. 12).

The period between 1988 and 1999 has seen some of the tensest patterns in the civil-military relations in Pakistan. Before his untimely death the third military dictator General Zia Ul-Haq had promised to hold elections on 16th November 1988. His presidential successor Ghulam Ishaq (G.I) Khan and the COAS successor General Aslam Beg decided to abide by the electoral schedule, albeit reluctantly. The elections were expected to be won by the Pakistan's People's Party (PPP), which was being led by Benazir Bhutto, whose father and former Prime Minister Z.A. Bhutto had been toppled and hanged by the Zia *junta*.

The military was uncomfortable with this eventuality. To challenge the PPP the military establishment is believed to have created and sponsored the main opposition party, the Islami Jamhoori Ittehad (IJI), an amalgamation of right-wing parties led by Nawaz Sharif. During the election campaign the IJI propagated, perhaps with the military's backing, that Benazir as an American stooge. They argued that Benazir's Western education gravitated her towards the U.S. and if elected to power she was likely to compromise Pakistan's nuclear programme to appease the Americans (E. Hussain, 2013, p. 259; Nizamani, 2000, p. 105).

The target audience of this propaganda were the people of Punjab province, which had the decisive vote in the elections because of the size of its population and was Sharif's

home constituency as well. The IJI was aware that the people of Punjab would not accept any politician who would jeopardise the nuclear weapons programme (Nizamani, 2000, pp. 105 & 107). Besides, the nuclear facilities working on the weapons programme were also largely situated in Punjab and thus were important economic sector for the province. Although the propaganda tactics did not work, it nevertheless made nuclear issue an important part of electoral and oppositional politics during the concerned decade.

The PPP predictably won the elections and the perturbed military scrambled to secure its interests and hold over the foreign and security policies, and the nuclear programme. Benazir's ascent to premiership was conditioned to her accepting few of their demands. Perhaps, the most important and profound of the conditions was for Benazir to have the caretaking the President G.I. Khan elected as the fulltime President. For the military, it was vital to retain G.I. Khan, a Zia loyalist, as the President for at least three parochial reasons:

First, G.I. Khan had inherited Zia's presidential powers to dismiss the parliament as he pleased. These powers had been granted to the President by the 8th Amendment of the constitution, which had been promulgated in November 1985 on Zia's behest (P. I. Cheema, 2002, p. 146). This provided the military with leverage to influence elected governments or have them dismissed through the President.

Second, again through the 8th Amendment, G.I. Khan inherited Zia's presidential powers to appoint the Chairman Joint Chiefs of Staff (CJCS) and the three service chiefs. It was thus crucial to co-opt for military friendly G.I. Khan as a junior partner in defence decision-making and formulation of policies that affected the armed forces (Siddiqa, 2001, p. 73).

Third, and more importantly from this research's perspective, G.I. Khan had been involved with Pakistan nuclear programme since the days of Z.A. Bhutto's premiership, had further entrenched himself during Zia's rule, and with Zia's death he was solely responsible for the administrative control over the programme. It was thus important for the military to have G.I. Khan serve as a conduit through which to exercise its influence over the nuclear programme, which otherwise had been lost with Zia. Accordingly, an added condition set by the military was also for Benazir to let G.I. Khan continue to administer the nuclear programme (F. H. Khan, 2012, p. 228).

Benazir acceded to the military's conditions and would later go on to say that she had formed a government in 1988 with her hands tied and that she was ousted by the President in 1990 because she chose to dictate her own security agenda (Aziz, 2020, p. 98). Indeed, once in power, she had tried using her prerogative for gaining some footing in the national security affairs, including the nuclear weapons programme and related decision-making, but found limits enforced on her authority for gaining access to the nuclear weapons programme.

When Benazir tried to arrange meetings with chairman PAEC Munir Ahmad Khan and chairman KRL A.Q. Khan she found presidential and military firewalls blocking her access. Learning of her attempts at contacting the heads of nuclear technical bureaucracies General Beg attempted to prevent Benazir from going through with those meetings (Nawaz, 2008, p. 422). General Beg had tried convincing Benazir that even he was not completely privy to the programme, nor was he the impediment, instead it was the President who controlled the programme. When she approached the President, he told her that there was no need for her to know (Frantz & Collins, 2007, p. 164).

A compromise was reached on decision-making process when Benazir invited both the President and the COAS for a meeting to discuss nuclear command and control issue. The meeting surprisingly obliged her, at least in that moment. According to Benazir it was decided, "although we had the capability to put together a bomb, [so as] to give the international community confidence, we decided not to put together the components of the bomb. We decided not to shape metal. We decided not to enrich Uranium to 92 percent although, at that time...we agreed to go down to 60 percent" (Nawaz, 2008, p. 422).

The meeting between the top three institutional heads led to the creation of what is referred to as *Troika* (F. H. Khan, 2012, p. 228; Nawaz, 2008, p. 422). Suggestion of the Troika was apparently made by General Beg, who termed the setup as the 'national command authority.' The Troika was to govern the policy matters relating to the nuclear weapons and foreign and security affairs. Ostensibly this arrangement was balanced, or was intended to create a balance, but in reality, the weightage of decision-making powers still laid with the President and COAS, whereas the Prime Minister only had modicum leverage in the relationship (F. H. Khan, 2012, p. 228).

Benazir was by and large kept at bay from the nuclear programme, and as the mistrust of Benazir grew with the COAS and the President, particularly due to her alleged inclinations towards the U.S., they began side-lining her, which resulted in Benazir losing the little influence she had garnered over the nuclear programme. In 1990, on Beg's suggestion G.I. Khan made the decision to accelerate the uranium enrichment programme without consulting or notifying the Prime Minister (Z. Hussain, 1998, p. 39). This alleged lifting of cap on the uranium enrichment that was placed on it by the Troika then became the catalyst for the U.S. impose Pressler sanctions on Pakistan.

By mid-1990 the military's top brass had decided to have Benazir removed from the office and General Beg conveyed military's views to President G.I. Khan, who on 6th August invoked his powers under the 8th Amendment to dismiss Benazir government on charges of corruption and misconduct (Nawaz, 2008, p. 310). A few days later A. Q. Khan in a lecture at the military run National University of Science and Technology (NUST) in Rawalpindi, claimed that he had repeatedly asked General Beg to get rid of Benazir as she was creating hindrances in the further development of Pakistan's nuclear programme. In a what appears to be a sponsored book by A.Q. Khan, Benazir was accused of being hand in glove with the U.S. to discontinue Pakistan's nuclear programme but failed to deliver to the Americans (Abbas, 2018, p. 273). On her part, Benazir also termed her dismissal as a "nuclear coup" (Rehman, 1999, p. 111).

On 6th November Nawaz Sharif was elected as the Prime Minister after what is viewed as an engineered election. Sharif's premiership saw reintroduction of cap on uranium enrichment (Z. Hussain, 1998, p. 40). The reversal of the uncapping underscored two realisations. *First*, that the military deliberately subverted Benazir's recommendations on the nuclear programme out of bias towards her, and *second*, the Pressler sanctions had taken its toll on Pakistan's military modernisation programme and conventional balance with India, and the military now wanted the pressure to be relaxed.

The military had thus come to expect the civilian governments to devise a diplomatic solution for weapons procurement from the U.S. without unilaterally surrendering the nuclear option (Rizvi, 2000, p. 212). However, Sharif largely failed to provide relief in this regard. One reason could be his inability to take more flexible position on the nuclear

programme because of the constraints posed hard-line factions in the military (Z. Hussain, 1998, p. 40). Electoral and oppositional politics, now being led by Benazir, may also have created hurdles.

A momentous occasion of Sharif's tenure, however, took place when he visited the secretive KRL uranium enrichment facility, first by any of the Prime Ministers. While addressing the gathering of nuclear scientists there, Sharif bestowed the title of "Father of the Bomb" to A.Q. Khan (Levy & Scott-Clark, 2010, pp. 395–396). The title side-lined both Z.A. Bhutto, who had the vision to start the nuclear weapons programme, and Munir Ahmed Khan, whose team at PAEC had contributed to the bomb design. Dr Khan would trumpet this title for as long as he lived.

However, despite being military's choice Sharif soon came into conflict with the military establishment and the president over several matters that concerned the military. In April 1993, G.I. Khan dismissed Sharif's government on charges of corruption, but only to be reinstated by the Supreme Court. As the rift between the President and Prime Minister widened then COAS General Abdul Waheed Kakar intervened and requested both to resign, which the two did on 18th July. G.I. Khan's resignation had a profound impact on the strategic weapons decision-making.

A popular belief has been that the military has had complete control over the strategic weapons programmes ever since Zia Ul-Haq deposed Z.A. Bhutto. Interviews conducted for this research, however, suggest that the military only acquired complete control of the programmes after G.I. Khan resigned and relinquished the administrative control of the strategic programmes to General Kakar upon his resignation (F. H. Khan, 2012, p. 324). G.I. Khan's decision to hand control over the COAS may have been because of his inclination towards the military, even though General Kakar had been instrumental in his resignation, and because of the governmental power vacuum resulting from the simultaneous resignation of Prime Minister Sharif.

On his part, General Kakar delegated the coordination responsibilities to then Director General CD-Directorate (DG-CD) General Ziauddin, who was to receive briefings from the scientific organisations and update the COAS. Ziauddin's successor General Zulfiqar Ali Khan

continued with this pattern (N. A. Salik, 2020). Thereon, Pakistan Army maintained its coordinative and administrative involvement in the strategic programmes, even when the civilian government had been elected back to power.

On 13th October 1993, Benazir made a successful political return to power and became the Prime Minister for the second time. This time around she decided not to antagonise the military and largely moulded her policies, in acquiescence, to that of the Army's. She also refused to entertain American requests on capping Pakistan's nuclear weapons programme. By now it was quite clear to her and others in the political sphere that the talk of capping, rolling back or abandoning the programme would be tantamount to a political suicide (Siddiqa, 2001).

Benazir also managed to appoint her party member Farooq Leghari as the President and establish cordial working relations with General Kakar. Where Sharif failed to have Pressler sanctions relaxed, Benazir's diplomatic efforts saw Brown Amendment passed by the U.S. Congress in 1995 to remove some restrictions on weapons sales to Pakistan. A year earlier, oppositional politics by Nawaz Sharif against both Benazir and the military almost derailed the Pakistan-U.S. dialogue when he pronounced that Pakistan possessed nuclear weapons (Rizvi, 2000).

It would have been expected that by now Benazir would have earned military establishment's trust, but in November 1996 her government was dismissed by her own President on the charges of corruption. In February 1997, Sharif became the Prime Minister for the second time with a substantial majority in the parliament. In a major a major act of parliament the 13th Amendment in the constitution, which stripped the President's power to dissolve the parliament, was successfully passed. In doing so, the parliament closed the doors on military's manipulation of the presidential seat to dismiss governments.

In May 1998, Sharif government was faced with an uphill task of responding to the Indian nuclear tests. After days of contemplation Sharif eventually green signalled Pakistani reactionary tests. The decision is believed to have largely come after recommendation of the top military commanders (P. I. Cheema, 2002, p. 176; Rizvi, 2000). Electoral and oppositional politics also proved to be a crucial determinant in the decision. Opposition members moved

resolutions in the Parliament demanding Sharif to test immediately; whereas the right-wing religious parties were threatening to take to the streets (F. H. Khan, 2012, p. 271). On her part, Benazir intensified pressure on Sharif to either respond to the Indian tests in kind or wear bangles. On 13th May, while Sharif government was still anxiously contemplating its response, the military planners received a letter from Benazir suggesting that Pakistan should go nuclear (Sharaf, 2018).

Sharif had created a domestic political pitfall for himself in 1988 by propagating that Benazir would compromise Pakistan's nuclear programme, and in doing so he styled himself as the potential saviour of the programme. Failure to live up to his claims by not testing would have jeopardised Sharif's political survival. He told the visiting U.S. Deputy Secretary Strobe Talbott that no leader in Pakistan could hope to survive in power after shying away from nuclear tests, in views of the prevailing public sentiment in Pakistan (N. A. Salik, 2017, p. 60).

The overt nuclearization of Pakistan was followed by renewed tensions in the civil-military relations. Then COAS General Jahangir Karamat resigned after developing differences with Sharif. His successor General Musharraf initiated the Kargil Conflict in May 1999, merely two months after Sharif had concluded nuclear CBMS with his Indian counterpart Vajpayee. With civil-military relations reaching tipping point, including over the Blair House meeting between Sharif and Clinton, the military toppled the government on 12th October. Under General Musharraf Pakistan saw major developments in the strategic programmes, which included instituting of a national nuclear C^2 system and rapid expansion of nuclear assets, including delivery vehicles like ballistic missiles.

7.2. Decision-Making on Ballistic Missile Programme: 1988-1999

In the cases of nuclear democracies, politicians, defence bureaucracies, and militaries can suggest guidelines or targets for strategic weapons R&D, and by funding particular lines of research and not others can influence its direction. However, it is the scientists, and the underlying momentum of technical innovation and scientific discovery, that are believed to determine which new weapons are to be conceived (Miall, 1987, p. 12). This argument underscores that in a democratic setup at least three direct actors are constant presence in strategic weapons decision-making. These include the civilian government, the military, and

the scientific leadership. The succeeding discussion details the role of these three institutional actors in the acquisition of ballistic missiles in Pakistan.

It is pertinent to highlight that the civilian government tend not to be characterised as a single unitary actor but multiple decision-making chambers like executive authority, i.e., President or Prime Minister, the ministerial cabinets or bureaucratic departments, legislature, etc. The discussion on civilian government in this chapter details the role, or lack of it, of Pakistani Prime Ministers, Defence Committee of the Cabinet (DCC), and the parliament in the acquisition of the dual-track ballistic missiles.

Military services also tend also to be divided into different branches. These usually included the army, the air force, and the navy. The discussion on military herein is largely focused on the role of Pakistan Army, which possess overriding influence on the policy apparatus of the state. However, PAF was the first military service to induct nuclear weapons since they possessed readily available delivery vehicles. A brief overview of inter-organisational rivalry, particularly between Pakistan Army and PAF, is deliberated upon.

Though not direct actors, intelligence agencies, particularly the Inter-Services Intelligence (ISI), tends to exercise substantial influence in extracting favourable decisions from the civilian leaderships, usually in support of Pakistan Army. Some experts believe that the ISI has played a supporting role in strategic weapons programmes. The below discussion briefly reflects upon the contributions, if any, made by the ISI in the dual-track ballistic missile programme.

The weapons laboratories and the nuclear technical bureaucracies that administer them perhaps have exercised greater influence on the strategic weapons programmes than the civilian leadership as well as the military. Their role is thus analysed in the discussion below. Additionally, focus is laid on *technological imperative* factor to assess if the progression and advancements in technologies and technical capacities as independent driving forces behind scientific/engineering pursuit of the missile programme.

7.2.1. Civilian Governments

Between 1988-1999, the important civilian decision-makers, as evinced from the above discussion, were the President and the Prime Minister. The role G.I. Khan is considered crucial in the solid-fuel missile programme. However, given the dearth of literature on his contribution the presidential role is briefly summarised in the discussion on the Prime Minister. The other important civilian platforms for military acquisition were the Defence Committee of the Cabinet (DCC), which had been involved in important decision-makings on strategic weapons, and the parliament. The role, or the lack of it, of these platforms is subject to below discussion.

7.2.1.1. Prime Ministers

Z.A. Bhutto is the only Prime Minister in the history of Pakistan to have had complete control over the nuclear programme. There are some indications that in 1974 Bhutto issued directives for pursuing a missile programme alongside the nuclear weapons programme (Binkley, 1994, p. 76). Feroz Khan (2020), suggested that this may well be true since Bhutto was truly determined to turn nuclear programme into [an operational] weapons programme. However, in his own research, he did not find any evidence of Bhutto's directive on missile programme. This research similarly failed to find any substantial evidence on this matter. From what is known; however, Bhutto did want to bring the Pakistani military into the missile age, but much of the focus was on conventional tactical systems like the ATGM (Wolpert, 1993, p. 236).

Moreover, Bhutto does not appear to have made investments in reinvigorating SUPARCO. Pakistan's sole organisation with a rocket research programme had not recovered from financial and technical dwindling since the departure of President-General Ayub Khan in late 19060s. Also, it would have been premature for Bhutto to invest in ballistic missiles as nuclear delivery vehicles before securing a guaranteed path to nuclear weapons acquisition. Besides, India had yet to demonstrate its rocket and missile capabilities and thus the idea of competing in this area may have alluded Bhutto and his advisors at that point in time.

The trends Bhutto's military modernisation plan during the time, however, are suggestive that the military aircraft may have been considered as the potential contender for nuclear weapons delivery vehicles. Given the resources constraints this path would be more feasible at the time. Bhutto government had purchased French Mirage-III fighter aircraft, which were deemed best outside of the U.S. and could carry nuclear bombs (Wolpert, 1993, p. 236). The acquisition of the aircraft may also have created ease in negotiating the reprocessing plant from France. Moreover, as extensively covered in this thesis, Bhutto also sought to acquire 110 U.S. A-7 Corsair-II DPSA, which were also known to be nuclear capable.

Based on the available literature and interviews conducted for this research it seems that there was, in fact, little consideration given to other types of delivery vehicles in the Pakistani strategic circle both during and after Bhutto's premiership. It was somehow assumed that the aircraft could be used for the purpose when it came to it. Even when India initiated its IGMDP in 1983 there was not much movement inside Pakistan in this direction. The popular belief had been that with F-16s Pakistan had an assured nuclear delivery option (F. H. Khan, 2020).

The missile programme, as evinced in this thesis, began sometime in 1987 during General Zia's dictatorship and became apparent, along with political its intrigues, in 1989 during democratic rule. As established, after the reinstatement of democracy important aspects of the strategic weapons programmes, including major decision-makings and control of the programmes, were not only kept out of the reach of the elected government but many developments within the programmes were also kept out of their knowledge. In February 1989, Pakistan conducted the flight-test of Hatf-I and Hatf-II. Although Benazir congratulated the nation, stating that the missile-launch enhanced the self-respect and esteem of the Pakistani people, and further alluded that the programme was fruition of what her father had started in 1974, she was allegedly not made privy of the development of the missiles or their flight-tests, and had only come to know of it from the newspapers (Binkley, 1994, pp. 76 & 91; Levy & Scott-Clark, 2010, p. 347).

Her congratulatory statement was possibly a political damage control move as not to appear out of loop on matters of strategic concerns. The oppositional politics during the 1988 elections is likely to have also influenced her statement. Despite her victory in the elections,

it was crucial for her to refute the opposition's propaganda and prove that she favoured the programme, as it was her father's legacy, to maintain her political support, particularly in the Punjab province.

More worrying than Benazir not being briefed on the missile programme was the fact that the flight-tests were initially scheduled to take place in December 1988 coinciding with Indian Prime Minister Rajiv Gandhi's visit to Pakistan. However, the tests failed due to technical reasons (Beg, 2021, pp. 195–196). Gandhi had travelled to Pakistan in December 1988 for SAARC summit and to conclude *Nuclear Non-aggression Agreement* with Pakistan. His visit was heralded by Benazir as a historic departure from over 40 years of hostility (Aziz, 2016). A successful flight test at the time would have put Benazir in precarious position. The military had, in fact, been wary of Benazir's keenness to cultivate cordial relations with Gandhi during his visits to Pakistan, and the alleged intelligence data collected on the dialogue between the two leaders lead the Army to view Benazir as 'unreliable' on security-related matters. This then served as the reason to continue to keep her in the dark about the most sensitive aspects of the nuclear programme (Rizvi, 2000, p. 207).

However, the flight-tests in February 1989, came with problems of their own the elected government. The U.S. had been perturbed for some time that the nuclear weapons programme was under the control of the Pakistani military, which did not divulge details to the civilian government (Rizvi, 1993, p. 110). The flight-test reinforced this perception and the U.S. further concluded that it was backing a weak Prime Minister in Benazir who was unable to control the Army that was openly defying the U.S. (Levy & Scott-Clark, 2010, p. 347). Perhaps to give her one fighting chance, the CIA decided to provide Benazir with a detailed briefing on the status of Pakistan's nuclear programme during her June visit. Benazir was also warned that the Presidential certification of Pakistan's "non possession" of a nuclear explosive device that year could be last one, after which the Pressler Amendment would be invoked (L. Weiss, n.d.). Despite the sombre mood in the U.S., Benazir successfully negotiated the procurement of additional F-16 aircraft from President Bush. In return Benazir gave her word that Pakistan neither possessed a nuclear explosive device or intended on building one (Z. Hussain, 1998, p. 40).

The CIA briefing was apparently intended to make Benazir knowledgeable on the subject and to facilitate her participation in the nuclear programme and the sale of F-16 were also approved, in part, to show the Pakistani people that their civilian leadership could effectively fulfil the country's security obligations (Abbas, 2018, p. 189; Rizvi, 1993, p. 108). However, the effects of these actions were the exact opposite of what was intended. Despite Benazir's success in acquiring F-16s on military's behalf, General Beg and President G.I. Khan became increasingly distrustful of her over the CIA briefing. It was at this point that the COAS and the President are believed to have removed the cap on uranium enrichment without notifying Benazir, which later resulted in the U.S. invoking the Pressler sanctions in October. F-16s that Benazir had successfully negotiated and paid for were held back.

As established in this research, it was because of the Pressler embargo that Pakistan decided to acquire the Chinese solid-fuel M-11 SRBM, and later M-9 SRBM as well. Formal negotiations for the missiles began during Benazir's premiership (F. H. Khan, 2020). The important question of concern from this research's perspective is of *how much of a participation was Benazir allotted in the procurement of the missiles?* According to Feroz Khan (2020), the Troika collectively provided the patronage for the [solid-fuel/M-11] missile programme. However, the administrative weightage, including on the financial planning, laid largely with President G.I. Khan. Nevertheless, Khan insisted that it should not be viewed as a one-person process. On the other hand, Syed Naveed Qamar (2021), a senior member of PPP, informed the researcher that the negotiations with the Chinese were conducted by Benazir herself.

However, what complicates the narrative on the timing of M-series procurements is the fact that Benazir's government was dismissed in August 1990, whereas Pressler sanctions were invoked in October, which would imply that the Chinese missile technologies were negotiated just prior to the imposition of Pressler sanctions on Pakistan. According to Feroz Khan (2020), there were several actions taken by Pakistan – not least the resumption of the uranium enrichment – that had convinced the authorities that Pressler Amendment sanctions were an eventuality. Moreover, both Benazir and General Beg had been cautioned by the U.S. that the presidential "no possession" certification in 1990 could be the last one. These factors

may have convinced the Troika members, particularly the military, to proactively seek ballistic missiles.

The level of secrecy assigned to the Chinese missiles was greater than the one that was subsequently assigned to the North Korean No-dong's procurement. Thus, details are hard to come by. The Chinese wanted to maintain utmost secrecy. The military also did not parade or flight-test the missiles when they arrived and instead let the unassembled units rest in their crates. The technical organisations responsible for producing indigenous solid-fuel missile from the M-series also moved methodically with their work to avoid suspicions. To G.I. Khan and Benazir's credit they also never divulged the details and took them to their graves.

Benazir subsequently also proved crucial in the procurement of the North Korean liquid-fuel No-dong. There are indications that the preliminary evaluation of the missile had been conducted in 1992, during Nawaz Sharif's premiership. However, the procurement began during Benazir's second tenure in 1993. The request for the procurement was made by Dr A.Q. Khan himself. In December as Benazir was preparing to embark on an official visit to China, Dr Khan asked her if she could also add North Korea to her itinerary. He informed her that he had been in talks with the North Koreans for acquiring the technology of their No-dong, which could carry nuclear payload, and that the North Koreans were willing to sell (Frantz & Collins, 2007, p. 207).

According to Frantz & Collins (2007, p. 207), a puzzled Benazir pointed out that Pakistan already had missiles capable of reaching India – a likely reference to the Chinese missile technology she had possibly helped acquire previously. However, Dr Khan told her that he and generals wanted longer-range ones, with bigger warhead capacity. Benazir was reluctant to exacerbate arms race with India, stating that "we have a policy of doing what India does." In response Dr Khan told her, "We should get the technology while we can, even if we don't use it."

According to Benazir, she had no idea what Pakistan could or couldn't do in terms of missile strikes on India since the military had never let her near the programme. However, she did not want to stand in the military's way and if North Korea could provide "intercontinental missiles" Pakistan needed she saw no harm in it (Levy & Scott-Clark, 2010,

p. 424). However, Benazir and President Leghari sought to first consult then COAS General Kakar. Apparently, Dr Khan had also visited Leghari for the missile's procurement and the President thought that getting the designs was a good idea. General Kakar also concurred with the President (Frantz & Collins, 2007, p. 207).

To A.Q. Khan, Benazir conditioned the procurement of the missile design and technology to him not developing it into a capability, and that she would not provide funds for this purpose. The rationale provided Benazir was that she believed in party, since India had not escalated by creating such a missile Pakistan should refrain from doing so as well (Levy & Scott-Clark, 2010, p. 424). Benazir's argument, however, overlooked the fact that at the time India had already conducted two flight-tests of the medium-range Agni-TD, the second being conducted only a year earlier in 1992, and during its first flight-test in 1989 it had demonstrated a range of 1000km.

In the end Benazir agreed to visit North Korea and brought up the issue with its leader Kim Il-Sung during the state dinner, who agreed to sell the missiles. The deal was, according to Benazir, concluded on cash (Corera, 2006, p. 89). According to Frantz and Collins (2007, p. 208), Benazir left the North Korea carrying several computer disks containing the blueprints for the latest version of the missile. The two authors claim that Benazir said she handed the data to A.Q. Khan. One the other hand, Levy and Scott-Clark (2010, p. 432), state that she handed the data to DG CD Directorate General Ziauddin.

In any case she reminded A.Q. Khan that the missile should not be developed unless India started work on its own long-range missile (Frantz & Collins, 2007, p. 208). However, once she had delivered the data, Benazir claimed that "they" came back to her seeking to develop this updated missile technology, but she refused to give them the money to go forward because she didn't want a missile race with India (Gardels, 2004). In 1994, whilst Benazir was till the Prime Minister, India conducted the third flight-test of Agni-TD. It is not clear if Benazir had changed her mind about developing the missile.

Military personnel interviewed for this research dismissed the notion that Benazir was ever opposed to the development of No-dong's technology into an operational capability and stated that she also did not have sufficient powers at the time to prevent the development

from going through. They stated that Benazir, in fact, boasted of her role in Pakistan's missile programme. Indeed, despite the controversies surrounding Pakistan's ballistic missile programme, particularly that of No-dong/Ghauri's acquisition, Benazir would go onto to describe herself as the "mother of the missile program," just as her father Z.A. Bhutto was the "father of the nuclear weapons.

Compared to Benazir, Nawaz Sharif has had made relatively subdued contributions in the missile acquisition, although it was more visible. A major role of Sharif in the missile programme perhaps was to reverse the decision to indeterminately postpone missile flight-tests. The decision had come after receiving letter from the Secretary of State Madeleine Albright asking not to take any misadventures, such as a missile flight-test, which would give the newly elected BJP government in India an excuse to undertake a misadventure of their own. Moreover, a missile flight-test would have also jeopardised the ongoing progress in rapprochement with the U.S. and the resumption of limited arms supply under the Brown Amendment.

For its compliance the U.S. on its part promised to make a statement praising Pakistan's restraint and simultaneously exalt themselves for convincing Pakistan not to go ahead with the missile flight-test. The U.S. somehow believed that in doing it would build pressure on the BJP to not follow up on its election promise of conducting nuclear tests. This, however, did not settle well with A.Q. Khan, who persistently complained to the Prime Minister that the deal was unfair and that he'll never be able to flight-test his missile this way. Sharif eventually caved to Dr Khan's pressure and authorised Ghauri's flight-test. The decision received support from the hawkish officers in the GHQ, who were critical of the U.S. for not living up to its bargain, and for not exercising similar pressure tactics against India for its multiple flight-tests of Prithvi-I (F. H. Khan, 2020).

The rhetoric from the Sharif government that followed the flight-test was not merely directed towards India. There were references to the U.S. as well. For instance, after the test Pakistan's Information Minister was quoted saying, "[the] government had strengthened the national defence by launching [the nuclear-capable] Ghauri missile . . . Now [the] country's fate was not decided by superpowers" (Haqqani, 2005, p. 550). However, no pressing security

rationale was available for the flight-test. Feroz Khan explained to the researcher that Ghauri's flight-test was an *internal-domestic dynamic,* much as its acquisition was.

Feroz Khan further explained that Dr Khan had completely charmed Sharif. He would visit the Prime Minister every third day. Often, he would complain to Sharif about his mistreatment by the military, saying that they were not releasing funds to him, and the intelligence was keeping tabs on him. According to Shuja Nawaz (2008, pp. 474–475), during Sharif's first tenure then ISI chief Lt. Gen. Javed Nasir had reported his suspicions on Dr Khan's financial misappropriation, his frequent trips abroad, and presented a dossier on 23 properties owned by Dr Khan in and around Islamabad to the Prime Minister but Sharif ignored the intel and refused to take any action against Dr Khan (Nawaz, 2008, pp. 474–475). Sharif had come to a point where he couldn't risk upsetting Dr Khan and would pick up the matter with military. Thus, when consistently pushed, Sharif greenlighted the test.

There are, however, some reports of chasm developing between Dr Khan and Sharif government. According to Siddiqa (2001, p. 188, 2021b, 2021c), between 1997-1999, there were rumours of Sharif government investigating siphoning-off of funds provided for the manufacturing of Ghauri missiles. Apparently, funds were allocated for 20 missiles but only 13 missiles were in the inventory. The investigation carried forward to Musharraf regime, who even though exposed Khan for his nuclear proliferation activities did not disclose the results of investigation into Ghauri funds misappropriation.

Interviews conducted for this research, however, did not corroborate with these assertions. Salik suggested that Sharif was not completely privy to the Ghauri programme. The deal was concluded during Benazir's tenure and Sharif was not in on the numbers. Sharif was also unaware that the first two flight-tests of Ghauri in 1998 and 1999 respectively had failed. However, he believed Dr Khan's claims that the tests were successful, and that he could develop a 3500km range variant of the missile, without questioning the need for such a long-range missile. Feroz Khan (F. H. Khan, 2020), alluded that Sharif was too entranced by Dr Khan to question or upset him.

Given that for the better part of 1988-1999 the strategic weapons programmes had been kept out of the reach of the elected governments an important question is, *why the*

Prime Ministerial assistance was sought for missile acquisition and other related decisions? The question is especially relevant in the case of Benazir, whom the military had initially sought to ostracise from strategic weapons decision-making. At least, four underlying reasons exist for this course of action by the military establishment.

First was the state's constitutional structure, which the military could not completely bypass. Naveed Qamar (2021), explained that although it is the military that designs the policies on matters of strategic concern, at the end of the day it needs the approval of the civilian government. The military also realised that the Prime Minister retained prerogative on formal procedures of state-to-state negotiations on weapons procurement from foreign suppliers and the financial authority to fund those procurements is also vested in them (Qamar, 2021; Siddiqa, 2021a).

During his presidency G.I. Khan may have been overseeing the financial management of the strategic programmes but the funds were issued by the elected governments. The financial authority of the Prime Minister likely became even more important once G.I. Khan resigned from the Presidency, removing the administrative middleman. Thus, while the choice making of the Chinese and North Korean missiles were made by the military and scientific bureaucracy, particularly A.Q. Khan for No-dong, formal negotiations and funds allocation for the procurement were carried out by the Prime Minister, which in both the Chinese and North Korean cases was Benazir.

Second was the element of personal relationship. This was, however, exclusively the case with Benazir. According to Gordon Corera (2006, p. 89 also see Abbas, 2018, p 214), the military and the A.Q. Khan enlisted Benazir for negotiating with the North Koreans because of her family name, which held weightage in Pyongyang because of her father Z.A. Bhutto's role in establishing relationship between the two countries. An important influence on Benazir's decision to travel to North Korea was persuasions by the PPP, which had maintained close relations with the North Korean regime. Similar argument could also be made for Benazir's recruitment for the Chinese missiles since Z.A. Bhutto was the biggest proponent of improving relations with China and had subsequently proven instrumental in achieving that objective.

Third factor was the idiosyncrasies of different Army Chiefs. Where General Beg, in collusion with the President G.I Khan, put constraints on Benazir and Sharif from meaningfully participating in the strategic weapons decision-making, General Kakar and General Karamat largely stayed out of politics and provided some space to the two Prime Ministers in the strategic weapons programmes. According to Salik and Feroz, both Prime Ministers were provided equal spaces. However, these spaces appear to have been largely provided under special circumstances (see the *fourth* point). By and large, the military maintained a distance between the strategic programmes and the elected governments.

Fourth factor was that whenever the economic and political costs were high the decision-making prerogative of the Prime Ministers was given due respect. Political commentators interviewed for this research suggested that the political and economic burden of sanctions imposed because of the missile acquisitions and nuclear tests were largely shouldered by the Prime Ministers, and not necessarily by those who had controlled these undertakings. Although, in the case of No-dong a greater political burden was subsequently shouldered by the military when A.Q. Khan's proliferation network and nuclear dealings with North Korea unravelled. However, this became the case since the military had usurped the civilian government in October 1999 and General Musharraf had taken up the role of the political authority for himself.

The role of the Prime Ministers, however, appears to be insignificant in most other important aspects of decision-making on ballistic missile acquisition much as in other matters of national defence. Their role in assessment making and weapons choice-making is less clear and unlikely. According to Siddiqa (2001, p. 55), it is the military establishment, particularly the senior echelons of the armed forces, that set the defense policy and arms procurement/acquisition agendas in Pakistan. Interviews with political commentators corroborate this assertion. According to Naveed Qamar (2021), as far as the weapon choices are concerned the military has always perceived that they know the best on these matters, whereas the civilian governments don't. Therefore, they expect the civilian leaderships to follow their guidance on these matters – which they can hardly turndown.

Of course, in the general sense, the civilian leaderships in any democratic system are not expected to be knowledgeable on technicalities relating weapon systems and are largely

reliant on bureaucratic structures to guide them. However, in Pakistan's case the democratic institutions had been, and continue to be, weak and disorganised in comparison to the military and the supporting civilian bureaucracies like the Ministry of Defence (MOD), Ministry of Finance (MOF), and Ministry of Foreign Affairs (the MOFA) that had been involved in defence decision-making have either sided with the military or their capacity to assist elected governments had deteriorated due to long period of military rule.

According to Siddiqa (2001, pp. 69–73), the MOD has been manned by retired and serving military personnel who naturally gravitate to their parent institution on defence decision-making and weapons acquisition. The MOFA was rarely consulted on these matters. Weapons acquisition/procurement were predominantly India oriented and focused on two major import sources, the U.S. and China, which resulted in the MOFA failing to develop business relations with other supplier states, and therefore offered little to no dividends to Islamabad in its arming against New Delhi and in finding alternative sources. While MOF had been relatively more stringent in its attitude they have, however, not been able to affect defense decision-making or enjoy the power to override decisions taken by the military.

7.2.1.2. Defence Committee of the Cabinet

Amongst the several cabinet committees the Defence Committee of the Cabinet (DCC) served as the core decision-making apparatus on defence and security issues, including on nuclear matters. The DCC was constituted in June 1948 as the highest decision-making body on defense policy and national security. Under the DCC was a Defense Council headed by the Minister of Defence and a civilian-staffed Ministry of Defence, which acted as the main institutional channel for civilian administrative and financial oversight over the military. The structure was intended on establishing civilian supremacy over military matters and national security. However, by early 1950s, the DCC started to atrophy (Shah, 2014, pp. 35–36 & 62).

The DCC was reinvigorated by Z.A. Bhutto in the 1970s. According to some sources the high-level meeting convened by Bhutto in 1974 to formally commence the nuclear weapons programme was that of the DCC. The meeting was attended by Foreign Minister Aziz Ahmad, Foreign Secretary Mr. Agha Shahi, Finance Secretary Mr. AGN Kazi, Secretary of Defense Major-general (Ret.) Fazal-e-Muqeem Khan, the three chiefs of staff of the armed forces,

PPP's Secretary general J. A. Rahim, and Information Minister Kausar Niazi (F. H. Khan, 2012, pp. 121–122; N. A. Salik, 2017).

However, major DCC related decision was taken in 1976. In May of that year, Bhutto government issued a *White Paper on Higher Defence Organisation* that gave the Prime Minister the ultimate authority on defence and national security related decision-making. The DCC was to assist the Prime Minister, who was also to serve as its chairperson, in deliberations on defence and security matters. Much as before, the Defence Council led by the Minister of Defence was to implement DCC's decisions (Nawaz, 2008, p. 343). The revised membership of the DCC included Ministers of Defense, Foreign Affairs, Commerce, Frontier Regions, Industries, Finance, Communications, and Interior, with their secretaries, and the Chairman Joint Chiefs of Staff Committee (JCSC).

The tri-services chiefs were not allocated a membership in the DCC but could be allowed to attend or be summoned if required. The post of Chairman JCSC as the head of tri-serves was also created by the *White Paper*. Much as in the previous case, the military services were placed under the Ministry of Defence. The intent of the revised DCC was to re-establish civilian supremacy over defence and security decision-making by introducing changes in the military structure (Shah, 2014, p. 125; Siddiqa, 2001, p. 40).

According to Siddiqa (2001, p. 37), the DCC's authority was merely theoretical. In reality, its powers were limited because of its structural and system related flaws. Policy matters pertaining to national security planning [in actuality] did not fall within its ambit and this problem was further compounded by the civilian decision-makers' lack of knowledge of military affairs, hence encouraging the service chiefs to exercise their independence. Furthermore, the DCC lacked permanent presence like a secretariat or supporting staff to ensure continued monitoring and analysis of evolving nature of threats and served as more of a conference room where members assembled on short notice (F. H. Khan, 2012, p. 333). Nevertheless, the DCC would often be convened for discussing critical matters relating to national security and the decision to conduct nuclear tests in 1998 was also taken in a series of three DCC meetings between 11th and 15th May.

The DCC was a part of the arms procurement decision-making process. According to Siddiqa (2001, p. 50), there were two approaches to arms procurement decision-making process:

a) Top-down approach, where the weapons procurement 'was' processed and sanctioned by the DCC.

b) Bottom-up approaches, where the DCC fell at the bottom of the policy-making ladder. The weapons requirements would be generated by the respective services and forces, forwarded to the Joint Staff Headquarters (JSHQ) where a 'consensus' decision would be made regarding the military needs of all the services and an 'Integrated Priority List' was prepared and sent to DCC.

However, in the case of ballistic missiles it appears that neither was it processed through the top-down nor through the bottom-up approach. Instead, a third *direct approach* the was adopted by Pakistan Army where the DCC was bypassed, and the Army conducted the business directly with Prime Minister. The assessments into the solid-fuel M-series SRBMs and the liquid-fuel No-dong were carried out by the Army's CD Directorate and Prime Minister Bhutto was requested to negotiate the purchase. Suffice to say the procurements of the two missiles were secretive, and the available literature gives the impression that there also was an element of urgency. Both the top-down and bottom-up approaches required arduous and time-consuming process involving dealing with multiple civilian and military bureaucracies. Thus, the Army may have sought it prudent and more efficient to approach the Prime Minister directly.

We are still, however, concerned with the question of whether other important civilian cabinet members of the Benazir and Sharif governments knew of the missile acquisition or participated in the process? Based on the data on the acquisition of the solid-fuel programme it is safe to conclude that President G.I. Khan was involved. However, he was neither a member of the Benazir's cabinet nor of her government. Ghauri's narrative shows that President Farooq Leghari had been directly approached by A.Q. Khan for No-dong's purchase. Although Leghari did not hold the same role in the nuclear programme as G.I. Khan did, he nevertheless still had powers under the 8th Amendment and therefore presidential

capacity to act as a junior partner to the military. However, much like G.I. Khan, as the President Leghari was neither a cabinet member nor part of the government.

During his 1995 visit to Pakistan to conclude the agreement on No-dong sale, North Korea's Marshal Choe Kwang met with President Leghari and Minister of Defence Aftab Shaban Mirani (Sublette, 2002). It is not clear if Mirani had been appraised of the reason of Marshal Kwang's. According to Salik (2009, p. 212), the Ministry of Defence had not been involved in the Pakistani missile programme. An important cabinet member from the DCC, who was unlikely to be bypassed was the Minister of Finance. According to Naveed Qamar (2021), who has served as both Finance Minister and Defence Minister, though not during the concerned period, the Finance Minister has more clout with the military because of their control over the funds than the Defence Minister, who is simply asked to stay put. It is unknown whether the PPP Finance Minister Ehsan-Ul-Haq Piracha during his government's first tenure between 1988-1990 was aware of the acquisition of the M-series missiles from China. On the other hand, during No-dong's negotiations Benazir herself held the Finance portfolio and was directly involved in the negotiations.

Military personnel interviewed for the research suggested that cabinet members belonging to the DCC were given briefings on everything related to the national security policy. However, the DCC held meetings on a handful of times in the 1990s, a majority of which were the three meetings held between 11th and 15th May to decide on Pakistan's nuclear tests. In any case, it is likely that, at least, some cabinet members of the Bhutto and Sharif governments, particularly the Finance and Foreign Ministers, to a certain extant were made part of the decision-making or were in the know of the acquisitions. Afterall, Pakistan Army's CD Directorate was linked with the MOFA.

7.2.1.3. Parliament

While the nuclear weapons programme formally began during Z.A. Bhutto's democratic premiership in 1974, the intended acquisition and subsequent measures taken to put the plans into action were not subjected to a democratic debate in the newly constituted bicameral parliament. Bhutto would occasionally make speeches in the National Assembly about the 'peaceful' nature of Pakistan's nuclear programme. However, beyond vague

statements there was no transparency on the issue and Bhutto was determined to keep the weapons programme between himself and select personnel of his choice (Niazi, 1991, p. 60).

On the other hand, is the fact that by the time Bhutto had initiated the nuclear weapons programme transparency over the acquisition processes in other nuclear weapons states, including those with strong democratic foundations, had been shrouded in official secrecies, both from the public and the legislatures. The security procedures designed to maintain secrecy over nuclear weapons restricted the circle of decision-makers to only those who were prepared to accept and develop nuclear weapons (Miall, 1987, p. 87).

However, even before official secrecies were enacted the fact remains that that there never was much of a transparency on the matter in other nuclear weapons states to begin with, and the programmes had mainly gone ahead mostly without democratic consents. In few of the exceptions where the issue of strategic weapons acquisitions was brought to the national legislatures, such as in the case of Trident and Trident-II SLBM in the British Parliament, the debates were held only after, not before, the decisions had already been made by the small circle of senior civil servants, military officers, and Ministers of the inner Cabinet (Miall, 1987, pp. 97–98).

Secrecy on the strategic weapons programmes on the legislative level in Pakistan is thus based on the norm practiced elsewhere in the nuclear club. Whether under democratic or totalitarian rule, the Pakistani parliament has largely remained aloof on the strategic weapons programmes. Speeches in the parliament on the subject are usually made to express support for the programme and highlight Pakistan's desire for nuclear peace in the region. Political leaders have also utilised the forum to highlight their contribution to the programmes and accuse their rivals of compromising on them. However, these debates have largely been inconsequential to the acquisition process.

The underlying issue for the parliament is its lack of institutional capacity and the acumen to discuss military matters. Defence budgets can provide general overview of military acquisitions but in Pakistan defence spending are deemed as 'charged' expenditure on which a public debate cannot take place (Siddiqa, 2001, pp. 74–75). In 2008, the Defence Budget was, however, presented openly in the parliament for the first time by then Finance Minister

Naveed Qamar, but the that was an exception and did not translate into norm. Siddiqa (2001, pp. 74–75), has summarised three reasons for the lack of discourse in the parliament on military matters (Siddiqa, 2001, pp. 74–75):

a) The elected body of the country mainly comprises members of the land-owning class who have traditionally operated in collusion with the military and civil bureaucracies.

b) The educational standard of the parliamentarians is generally low, which adds to their general inability to question arms procurement or any other defense decisions.

c) The political leadership, for reasons of personal ambition for power, deliberately supported the military and its demands. This presented the politicians' belief in the armed forces being the key actor in the country's power politics.

There is also a fourth factor of *intimidation* that obstructs parliamentary debate on strategic weapons acquisition. The parliamentarians are dissuaded by fear that their dissenting opinions and questionings may be interpreted as being out of bounds or even treacherous both by their peers and the military (Mian, 1998, p. 55). Such perceptions have political repercussions of their own. For instance, in 1998, the Baluchistan National Party (BNP), the ruling party in the province of Baluchistan where the nuclear tests were conducted, and its student wing the Baluchistan Students' Organisation criticised the nuclear weapons policy, arguing that scarce resources were being diverted from developmental purposes to defence. In July, despite being allied with the Sharif government in Islamabad, BNP's government was booted out following a loss of majority in the Baluchistan Assembly as result of internal defections. BNP Chief Minister Akhtar Mengal accused the Sharif government and the intelligence agencies of having contrived his dismissal to punish his party for its opposition to nuclear weapons policy and, specifically, to the tests on Baluch soil (S. Ahmed, 1999).

Nevertheless, some briefings have been imparted to the Parliamentary Committee on National Security (PCNS). The Committee did pose some questions and to extant answers were provided (Qamar, 2021). It is unclear if the missile acquisition, especially the foreign templates, were ever discussed sufficiently, if at all they were discussed, in the PCNS. General impression is that the briefings and responses were generic in nature. Besides, much like in the case of Trident and Trident-II D-5 debates in the British Parliament, the parliamentary

committee discussions on weapons acquisitions appear to have taken place after the acquisitions have taken place, and not before that.

While the parliamentarians ostensibly lack the capacity and culture to hold discourse on strategic weapons acquisitions, they do understand where the interests of the state and the people are and have, at times, braved to protect those interests even when under pressure. For instance, the parliament defied General Zia Ul Haq's proposal for defence tax and in a recent case refused to allow the Pakistani military to be deployed in Yemen despite Prime Minister Sharif's willingness to do so (Qamar, 2021).

However, given the fact that Pakistan is largely a 'security state' where public opinions on national security flow from the military's worldview the parliamentarians are likely to be found on the 'same page' as the public and the military on the matter of strategic weapons acquisitions. There can be little argument against the fact that most Pakistanis prefer the nuclear weapons programme to continue. Suffice to say there have been no consequential debates on the strategic weapons acquisitions in the Pakistani parliament.

7.2.2. Military

The organisational or bureaucratic-politics arguments hold that the military services are the key players in shaping the weapons systems that a state acquires. The Pakistani military has indeed played a decisive role in Pakistan's strategic weapons programmes and has set the contexts for the developments within them. However, military's interest, acceptance, and involvement in the nuclear programme has come fairly late. The pre-nuclearization Pakistani military was a classical conventional force, which rather than recognising the potential of nuclear weapons as an equaliser to conventional force imbalance concluded that such non-conventional weapons are detrimental to their conventional weapons acquisition and should thus be eschewed.

Unlike in the case of nuclear weapons programme where it initially chose not to actively participate the military, more specifically Pakistan Army, took the initiative for commencing the ballistic missile programme. In 1980, General Mirza Aslam Beg was appointed as the Chief of General Staff (CGS). General Beg (2021, p. 130), recalls that he was

granted full liberty by President-General Zia Ul-Haq to modernise the Army according to the latest requirements, replace the old weapons with the modern weapons and formulate the defence policy anew. To spearhead weapons R&D and weapons indigenisation, General Beg established Combat Development (CD) Directorate within Pakistan Army's General Headquarters (GHQ). The CD Directorate became functional in 1985.

In the Army's organisational structure, the CD Directorate was intended to function as a bridge between the Military Operations (MO) Directorate, which was responsible for determining the General Service (GS) requirements, as laid down by the CGS, and Weapons & Equipment (W&E) Directorate, which is responsible for procurements of the approved systems and sends the final recommendations to the Ministry of Defense (F. H. Khan, 2012, p. 325, 2020). When General Beg was promoted to Vice Chief of Army Staff in 1987, he tasked the CD Directorate to commence R&D into ballistic missiles in collaboration with MO Directorate and SUPARCO. The military and scientific organisations put together available technologies to develop solid-fuel Hatf-I and Hatf-II SRBM and hastened to flight-test them after India's Prithvi-I flight-test.

As recalled in *Chapter-4*, the cursory mannerism of Hatf-I and Hatf-II's development, their rushed flight-tests, and their deficient military utility does not suggest that they were intended to serve as a rational response to perceived threats from India, including from its Prithvi-I SRBM whose flight-test had preceded that of the two missiles a year before. Interview data collected for this research leads this research to conclude that the development of the two missiles resulted from the organisational impetus for weapons indigenisation, which itself had resulted from the creation the CD Directorate.

In his interview Feroz Khan confirmed to the researcher that the two ballistic missiles, started out as projects of the CD and MO Directorates [along with SUPARCO] and were developed for interests other than security. Khan stated that the two missiles were more of a 'politicised' capability than a real military capability. Additionally, the project may have also been intended to gauge national technical capacity for developing ballistic missiles. From theoretical perspective it could be argued that the development of the two missiles was motivated by parochial bureaucratic and organisational interests like knowledge inquisitiveness, technological and national prestige, and perhaps also desire to shore up

budget. On the other hand, their hastened flight-tests that came in response to that of India's Prithvi-I, were largely motivated by desire to catchup or technologically counterpoise Pakistan with India for maintaining regional political or techno-political relevancy much as India had, in part, sought to catchup or counterpoise itself with China to create an extra-regional or international relevancy for itself through its own missile programme.

Despite the first two Hatf missiles being deficient capabilities, the CD Directorate became the focal point for ballistic missile acquisition. The task of conducting comprehensive analysis for the acquisition of more advance ballistic missiles was deputed to the CD Directorate, which recommended the COAS for not just off-the-shelf purchase but also a complete TOT to help redress the Pakistan's lack of technical expertise and help develop infrastructure and equipment to produce missiles indigenously in the future (F. H. Khan, 2012, p. 238). The CD Directorate's recommendation likely reflected its organisational routine of facilitating both the military modernisation and weapons indigenisation.

The recommendation deemed Chinese M-11 and later M-9 as the logical choices for reasons comprehensively addressed in this thesis. However, the specificities of the military's operational assessments into these missiles, particularly relating to important questions like *what military missions the missiles were intended for?* And *were the missiles able to carry out those missions?* are less clear. While the overarching rationale for acquiring these missile systems established in this thesis is: to offset the military imbalance created by the Pressler embargo, at least in the short run, there was also a short-lived but profound political aspect to it, which was the policy of 'strategic defiance' of the U.S. This was, however, idiosyncratic to General Beg. According to Feroz Khan (2020), General Beg publicly propagated the policy of 'strategic defiance,' especially in the wake of the first Gulf War, and to that effect he even gave a lecture on the subject at the Pakistan Army's National Defence University (NDU).

On the nuclear programme, General Beg took an incongruous stance to the state's official policy of 'non-possession' of nuclear weapons, which had been in effect since Zia's rule to propitiate the U.S. for acquiring conventional military assistance. General Beg argued that Pakistan needed to stop hiding its bomb and that Pakistan needed missiles with which to launch them or planes from which we could drop them (Levy & Scott-Clark, 2010, pp. 318–319). Feroz Khan (2020), suggests that General Beg's belligerence and defiant attitude

towards the U.S. were the result of the overall downward trajectory of the U.S.-Pakistan relations in the post-Cold War and post-Soviet-Afghan War period, and the subsequent Pressler embargo only served to exacerbate his sentiments.

Ironically, the Pressler embargo appears to have resulted from the actions of General Beg. These included his claim of deploying F-16s equipped with nuclear bombs during the 1990 Compound Crisis, accentuating that not only Pakistan possessed nuclear weapons but had also modified the U.S. supplied aircraft to drop them with, and his alleged role in lifting the cap on uranium enrichment. Pakistan's proactive interest in acquiring the Chinese missiles and Benazir's dismissal in August may also have contributed to the list of American considerations to invoke the Pressler Amendment.

On 8th January 1993, General Kakar took up the reins of the COAS after sudden death of his predecessor General Asif Nawaz Janjua who in turn had succeeded General Beg. While General Kakar did not adhere to the policy of strategic defiance he upped the pace of General's Beg's military modernisation. General Kakar's tenure is of high significance for two reasons. *First*, as stated before, for the first time the military acquired complete control over the nuclear weapons programme, and *second*, the period saw renewed emphasis on indigenous manufacturing of weapons.

In a 1993 seminar on 'Self-Reliance in Defence' General Kakar stated, "it is a time-tested fact that no country can maintain her armed forces on borrowed weapons. To be self-confident in the community of nations Pakistan must become self-sufficient in defence production" (Siddiqa, 2001, p. 109). General Kakar tenure therefore saw expansion in the military industry in Pakistan, focusing not just on small arms but major mainstay weapon systems like Tanks, aircraft, and more importantly from this research's perspective, ballistic missiles.

To expedite ballistic missile development General Kakar established Project Management Organisation (PMO) in 1994, which was to create foundations for developing solid-fuel missiles by absorbing TOT, and by learning reverse-engineering and assembly techniques for the unassembled M-series missiles. Along with National Defence Complex (NDC), as subsidiary of PAEC, and Air Weapons Complex (AWC), a subsidiary of PAF, PMO was

third organisation tasked with working on nuclear delivery vehicle programme. At the time, NDC was working on air deliverable nuclear device and AWC was assisting it with the aerodynamics (F. H. Khan, 2012, p. 239). PMO was tasked to work with both NDC and AWC to achieve its developmental goals (F. H. Khan, 2012, pp. 186 & 239). It subsequently started working on a solid-fuel SRBM that would be revealed as Ghaznavi (N. A. Salik, 2020). After the success of the air deliverable test in 1995, General Kakar issued directive for Dr Samar Mubarakmand, the head of NDC, to lead the [solid-fuel] missile programme. NDC's project would be revealed as Shaheen-I (F. H. Khan, 2012, p. 240).

The acquisition of the North Korean liquid-fuel No-dong also took place during General Kakar's tenure. According to Feroz Khan (2012, p. 238), along with the solid-fuel missiles the CD Directorate had simultaneously recommended the procurement and TOT of liquid-fuel missiles to the COAS. In his interview to the researcher, Feroz Khan explained that the proposal for the acquisition of No-dong split the GHQ into two groups. The opposing group questioned the need for the North Korean liquid-fuel technology when better [solid-fuel] missiles were already available with Pakistan. They argued that unlike Pakistan-China relations Pakistan's collusion with North Korea would not go well with the U.S. The opposing group was also pro-China and, as stated before, China was not too keen on Pakistan's missile dealing with North Korea.

Nevertheless, No-dong's acquisition was approved. Its longer-range possibly made it an attractive weapon system for the Army, and it was also prudent to have in place a second supply channel for missile acquisition. Much as in the case of the solid-fuel missiles important questions regarding operational assessments, particularly of the military missions for the missile, and its ability to perform those missions are less clear. However, there was an added issue of Pakistan's inexperience in handling liquid-fuel propellent. However, Feroz Khan informed the researcher that the Army was, in fact, aware of the technical intricacies, limitations, and volatile nature of liquid-fuel systems. Army's consent to acquire No-dong is thus a curious case.

Interviews with some of the military personnel suggested that the acquisition of No-dong largely took place at A.Q. Khan's behest. During the concerned period it was a common practice amongst decision-makers like President G.I. Khan, General Beg, Prime Minister

Sharif, and others to be unquestioningly facilitative towards Dr Khan's demands. However, General Kakar's successor, General Karamat had begun getting irate with Dr Khan's behaviour (F. H. Khan, 2020). General Karamat was apprehensive about the alleged misappropriation of funds by the scientific organisations and sought to have KRL and PAEC investigated by the Prime Minister during his first year in the office (Corera, 2006, p. 145; also see Abbas, 2018, pp. 196–197).

Other Army personnel were also reportedly getting increasingly discontent about the independence of KRL in getting funds from them and then using those funds without GHQ being able to exercise sufficient control over it (Siddiqa, 2001, p. 188). Details of Dr Khan's financial misappropriations and proliferation activities were being further provided by the U.S. (Corera, 2006, p. 145). However, all attempts at investigating Dr Khan met with considerable resistance and soured relations between him and the Army, and he complained to Prime Minister Sharif about the military and the intelligence services keeping a tap on him (Corera, 2006, p. 145; F. H. Khan, 2020). Although, as stated before, even Sharif allegedly tried to audit Dr Khan on the Ghauri programme in 1999.

The issue of flight-testing Ghauri presented the military with another dilemma. According to Feroz Khan (2012, p. 485), A.Q. Khan approached DGCD General Zulfiqar Ali Khan in early 1998 to have Ghauri's flight-test approved but based on several considerations it was decided 'not to up the ante.' Dr Khan then approached COAS General Karamat and Prime Minister Sharif. In his interview Feroz Khan stated that while General Karamat was not opposed to the acquisition of Ghauri he, however, advised Prime Minister Sharif not to flight-test the missile. The primary consideration behind the advice appears to have been U.S.-Pakistan rapprochement. However, General Karamat relented when Prime Minister Sharif used his prerogative to greenlight the flight-test for 6th April 1998 (F. H. Khan, 2020).

Military's relations with A.Q. Khan soured further during General Musharraf's tenure, especially when Dr Khan's proliferation activities were unravelled, and the U.S. made some of the evidence public. It is unclear how much the military leaders knew of Dr Khan's nuclear export activities or whether anyone from the military was involved. Dr Khan, however, accused successive Army Chiefs, including Musharraf, for not only being in the knowhow but also in the proliferation profiteering. In the end, Musharraf sent Khan into retirement and

suspended further missile cooperation with North Korea. Ostensibly this was done to appease the U.S., but the fact that the North Korean technology was also deemed unsatisfactory may have contributed to the decision as well.

7.2.2.1. Inter-Services Rivalry

Much as in the case of civil-military relations the inter-services relations are also lopsided. Pakistan Army accounts for 82% of Pakistan's quantitative military strength and commands greater resources, whereas the PAF and Pakistan Navy (PN) combined represent only 18% of forces (N. A. Salik, 2020). But disparity in size and resource allocation are not the only factors that tilt the balance in Pakistan Army's favour. The Army also possesses a great political power of its own not just on strategic issues but overall state affairs. Thus, it has enjoyed more influence in policy matters than the other two services, both during democratic periods and their own totalitarian rule. Even though, the Z.A. Bhutto government in 1976 issued a White Paper aimed at empowering the civilian authority over defence matters, curtailing Army's political power, and narrowing the gap between the tri-services, these objectives could not be achieved, and the purpose was entirely lost after the military took over in 1978.

Siddiqa (2001, p. 60), argues that the air force and navy's ability to get their plans and acquisitions approved by the government, or have a say in strategic planning, has depended upon their importance for the Army. For instance, the Army has viewed the air force as its necessary supporting arm and thus Zia's regime assigned greater importance to the acquisition of F-16 for PAF in the 1980s (Siddiqa, 2001, p. 63). For PAF, F-16 may have been important platforms for their air superiority missions, as evinced by their operations during the Soviet-Afghan War, but the Army possibly saw the acquisition as a close air support asset for their own ground-based operations. In fact, the original plan had been to acquire A-7 or a ground attack aircraft that could strike at enemy's tanks. Thus, when F-16 sales and support were suspended by the U.S. the Army likely perceived it as a loss in its own close-air-support and long-range strike capability, and thereby sought to augment the loss with ballistic missile acquisition.

Since the navy has been of less consequential for Army's land-based operations, naval acquisitions have not received significant attention for a considerable duration. In her interview Siddiqa (2021a), also stressed that PAF did not appreciate being perceived as a 'supporting arm' of the Army and would prefer autonomy in its operations. According to her PAF was upset over the progression in the nuclear programme, particularly the 1998 test, believing that it was getting in the way of acquiring F-16s. PAF along with PN are a capital-intensive service dependent more on technological platforms than number of personnel. Thus, for PAF the loss of F-16 sales and support constituted a major blow to its organisational preservation.

Citing former Director General ISI General Hameed Gul, Siddiqa (2001, pp. 58–59) writes that during a closed-door annual seminar organised by the Joint Chiefs of Staff Committee (JCSC) on 5th September 1991, papers were presented by the three military services that advocated the rollback of the nuclear programme, raising concern that it blocked the possibility of acquiring weapons from the U.S. Arguments favouring the rollback were ruled out because of the concern for maintaining a certain strategic balance with India. Retired military personnel interviewed for this research, however, argued that there was broad consensus across all the concerned civilian and military institutions on strategic weapons programme and the nuclear tests in 1998.

Prior to the acquisition and operationalising of ballistic missiles PAF was also the only service with nuclear delivery vehicles in the shape of its F-16 and Mirage-III/V aircraft. With the acquisition of ballistic missiles, they were likely to lose their monopoly. In fact, it could be postulated that Pakistan Army had sought to break PAF's monopoly on nuclear weapons custodianship and thus prioritised ballistic missile acquisitions for itself. After all, General Kakar's decision to expedite indigenous solid-fuel ballistic missile development came soon after the successful test of the air deliverable nuclear device (F. H. Khan, 2012, p. 186). However, evidence to support this hypothesis is scant.

According to Salik (2020), however, while PAF did not object to ballistic missile acquisition by Pakistan Army it did not favour the creation of a formal C^2 structure in the shape the NCA and SPD. Then CAS Pervaiz Mehdi Qureshi believed that PAF had more expertise in handling nuclear weapons compared to other services. PAF also gave the example

of the strategic command in the U.S., where all the nuclear weapons were in the custody of the USAF and wanted to follow similar precedence in Pakistan with PAF as the overall in charge over the management of nuclear weapons capability. It should be noted that under the U.S. model it would entail that PAF should be the custodian of both the air-dropped atomic bombs as well as the nuclear tipped ballistic missiles. Interestingly, while PAF took the responsibility for storing the unassembled M-11s at its base in Sargodha it did not or was not provided with operational custody of the missiles.

In his interview, General (R) Kidwai, however, categorically refuted the assertion that PAF or its chief had objected to the instituting of the formal C^2 system. He explained that he had personally presented the plan for the creation of the national C^2 mechanism to the three services chiefs, which was widely praised and approved without any objection or inter-services conflict. He explained that none of the other services was working on an alternative mechanism, therefore there was no conflict of interest. Moreover, the C^2 mechanism envisioned a tri-services strategic forces command, i.e., Army Strategic Force Command (ASFC), Air Force Strategic Force Command (AFSFC), and Navy Strategic Force Command (NSFC). General (R) Kidwai (2022) explained that each of these strategic forces were to take custody of nuclear delivery systems relevant to their mission, i.e., ASFC was to handle the land-based systems, including ballistic missiles, AFSFC was to handle gravity bombs and Ra'ad series ALCM, and NSFC was to handle to nuclear second-strike capability. Assets developed for one strategic force also could not be operated by the others. General (R) Kidwai insisted that not only there is no clash but each of the strategic force command is satisfied in its place.

7.2.3. Intelligence Agencies

Each of the three military services have their own intelligence directorates, i.e., the Military Intelligence (MI), the Air Intelligence, and the Naval Intelligence. However, the premier and most impactful of the intelligence agencies in Pakistan is the Inter-Services Intelligence (ISI). Formed in January 1948, the ISI was the brainchild of Major General Walter Cawthorn, a former senior military intelligence officer in the British Indian Army who at the time was serving as the Deputy Chief of Staff of the Pakistan Army, and Syed Shahid Hamid then a colonel in Pakistan Army. Cawthorn conceived the agency after weaknesses were

exposed in the existing military intelligence network when India launched its surprise summer offensive in Kashmir to occupy the region, resulting in the first Kashmir War (Hamid, 2021).

Over the years the ISI has established itself as a well reputed and highly effective intelligence and counterintelligence agency. However, the agency conceived largely to keep a watchful eye on the external threats also became a potent tool in domestic politics. Although early military dictators like Ayub Khan and Yahya Khan had used the ISI to keep tabs on their domestic oppositions it was ironically democratically elected Z.A. Bhutto who established the political wing in the ISI in the 1970s (Haider, 2008). Since then, the ISI has operated at the behest of the governments, whether civil or military, who want it not only to serve an intelligence function but also to implement policy (Nawaz, 2008, p. xii).

Overall, the ISI is, however, loyal towards the military and the GHQ retains considerable control over the agency. Even though it's the Prime Minister who appoints the ISI's chief the core personnel of the agency, including its chief, are recruited from the army. This provides COAS with substantial leverage in using the agency to serve the armed organisational interests (Siddiqa, 2001, p. 76). The Army fraternity factor also tends to moderate the conflict of interest.

The ISI also believed to have provided consequential support to Pakistan's nuclear and missile programme and not merely in counterintelligence efforts. Up until 2001, the ISI's Joint Intelligence Miscellaneous (JIM) section,[1] which was responsible for conducting espionage and offensive intelligence operations abroad, was believed to have been linked with the CD Directorate, and later with its successor the SPD, was reportedly involved facilitating clandestine procurements and shipment of the nuclear and missiles materials from aboard. (Levy & Scott-Clark, 2010, p. 433; Reichental, 2012, p. 53). However, the ISI's participation in nuclear policymaking and influence in shaping the developments within the programme is less clear. From what appears it was not entirely in on the policymaking side of things.

There is, however, an instance where DG ISI (1987-1989) General Hamid Gul reportedly suggested President G.I. Khan to accelerate the nuclear weapons programme,

much as then COAS General Beg had. Gul argued that Pakistan would not 'rollback' its nuclear programme at the U.S.' request. He further opined that Pakistan must wield the bomb, refine missiles, and other delivery systems that would leave India in no doubt of Pakistan's capabilities (Levy & Scott-Clark, 2010, pp. 318–319).

Interviews conducted with relevant personnel indicated that intelligence agencies, including the ISI, lacked understanding of the strategic programmes much less give an intelligent assessment on the matter. If an assessment was ever solicited from them, it came out to be unsatisfactory. Thus, for sounder assessments Pakistani officials were reliant on PAEC and other organisations that have better understanding of technical matters relating to the nuclear and missile programmes of both India and Pakistan. It is unclear if the ISI subsequently developed a capacity for understanding technical and strategic issues of the strategic weapons programmes, but after the establishment of the formal C^2 system in 2000-2001, the SPD has come to acquire its own intelligence/counterintelligence unit.

7.2.4. Weapons Laboratories

The fundamental of this thesis are based on the realisation that the military's assessments strong preferred solid-fuel systems yet the liquid-fuel No-dong/Ghauri was introduced midway into the equation. In his interview, Salik informed the researcher that the solid-fuel Ghaznavi and Shaheen were indeed the priority programmes whereas the liquid-fuel Ghauri was not. There are significant hints that lead one to the believe that Ghauri resulted from DSM. Beyond its attractive long-range, the proposal for No-dong's procurement appears to have lacked a coherent security rationale and as stated before, the proposal split the GHQ into two groups. However, A.Q. Khan managed to enthral some of the military personnel with his jingoistic speech (Corera, 2006, pp. 142–143). In the end, the acquisition was approved despite North Korean missile being found technologically volatile and politically and economically problematic.

During the concerned period, the top nuclear technical bureaucrats maintained direct access to the key decision-makers like the President, the Prime Minister, and the COAS, and had capacity to exploit them for their parochial interests. This was made possible because of the open-door policies exercised by the top decision-makers for the leading scientific

bureaucrats. The practice had been put in place by Z.A. Bhutto to meet the scientific requirements on urgent basis. These decision-makers were especially facilitative towards A.Q. Khan. They held Dr Khan in high regards and had a blind faith in him to deliver on his promises. According to Feroz Khan (2020), there was a "mantra" of, "nobody can achieve anything except A.Q. Khan." This enabled Dr Khan to develop a tendency for forcing his way into important conventional weapons R&D programmes. He often promised to find right solutions to Pakistan's conventional weapons requirements through weapons indigenisation programmes and demanded funds from the decision-makers, despite convention weapons not being his mandate.

In 1980s, KRL had begun developing solid-fuel *Anza* MANPAD and *Bakhtar Shikan* ATGM. In the late 1980s, KRL was reportedly tasked with assisting in the Hatf-I and Hatf-II programme (F. H. Khan, 2012). Its work on solid-fuel MANPAD and ATGM systems as well as its greater financial resources made it an attractive choice to assist in the development of the two SRBMs. Dr Khan also acquired weapons like SA-16 from North Korea, which provided him with the doorway to No-dong's acquisition. He would often promote his weapon systems as indigenous. However, they were merely assembly works of imported items. Dr Khan's behaviour, according to Feroz Khan (2020), undermined and weakened other [smaller] R&D organisations.

There are also indications that A.Q. Khan's interest in developing a ballistic missile system predated Hatf-I and Hatf-II and the subsequent dual-track programme. As stated previously, A.Q. Khan had claimed in a TV interview that there were plans [or, at least, intention] to commence a missile programme in 1981, but President-General Zia Ul-Haq did not allow the programme to go through to avoid upsetting the Americans. Dr Khan's claims cannot be verified but journalist Shahid Ur Rehman (1999, pp. 80–81), insinuates seeing a letter titled "The Delivery System" written by Dr Khan to Zia on 21st December 1981, asking permission to start work on the development of a surface-to-surface missile programme. Dr Khan wrote that "within a very short time, we will be able to make a nuclear weapon and we must have a delivery system... Please let me go ahead."

In 1988, PAEC had begun design and developing a deliverable atomic bomb, both from an aircraft and a missile (M. Ahmed, 2012, p. 301). A.Q. Khan would often claim that the bomb

design was produced by him sometime in 1983 and that he had validated it through cold tests. He informed President-General Zia Ul-Haq about it and then upon President's request submitted the design with the GHQ for safekeeping. Dr Khan alleged that the designs were then taken out by General K.M. Arif, a close confidant of Zia, who copied them and passed them over to PAEC (Rehman, 1999, pp. 80–81; Waheed, 2013, pp. 239–240). Apparently, General Arif and Dr Khan had tense relations, and Arif had grilled Dr Khan after his interview with the Indian journalist Kuldip Nayar in 1987, in which Dr Khan disclosed Pakistan's possession of the bomb capability in a stark contrast from General Zia's official stance (F. H. Khan, 2012, p. 225).

Between 1988 and 1995, NDC/PAEC and AWC/PAF began perfecting the air-deliverable nuclear bomb and aircraft manoeuvres for dropping them (M. Ahmed, 2012, p. 301; F. H. Khan, 2012, p. 187). The collaboration between the two organisations not only meant that PAEC was attempting to perfect an operational nuclear explosive device, but it also had a readily available partner in PAF to provide delivery vehicles – i.e., aircraft – to drop their device from – a luxury not available to KRL. In 1990, Pakistani government negotiated the Chinese M-series missiles, but none of those were heading KRL's way. Instead, the task for developing advance Shaheen-I was deputed to the Dr Khan's rival Dr Samar Mubarakmand in NDC.

The choice of NDC over KRL for missile development was straight forward. According to Salik (2020), the theoretical physics, conventional explosives, electronic package, etc, were being handled by PAEC, but above all PAEC/NDC was responsible for design of the nuclear explosive device [and it had demonstrated successful cold tests by 1995]. On the other hand, out of 16 or 18 steps being carried out to build the bomb, KRL had single mandate of uranium enrichment. However, Dr Khan pretended to be solely running the project (Siddiqa, 2001, p. 187). PAEC was also not completely cut off from the enrichment programme either. Before the enrichment process PAEC would produce the uranium hexafluoride gas and hand it over to KRL for enrichment. Once enriched PAEC would take back the possession to turn it into solid metal for manufacturing the fissile core (N. A. Salik, 2020).

With PAEC progressing on the nuclear explosive device and the delivery vehicle programme A.Q. Khan intensified his bureaucratic politics to stay in the game. Dr Khan's

strategy was to either to subvert PAEC/NDC or acquire parallel weapons programme. During Benazir's premiership, he reportedly complained to her about PAEC's incompetency and requested her to give him the charge of the organisations, which Benazir refused (Abbas, 2018, p. 183). In 1992, During Nawaz Sharif's premiership, possibly without governmental knowledge or approval, Dr Khan began exploring his own option for a delivery vehicle, which led his search to the North Korean No-dong.

In 1993, when Benazir was back in power, A.Q. Khan approached her for procuring No-dong's technology. Dr Khan, who had previously claimed to have suggested General Beg to get rid of Benazir, now employed appeasement method to win over Benazir. When Benazir raised the issue of the missiles already in development, he informed her that those missiles were non-nuclear, and that the North Korean missile offered greater range. In essence Dr Khan was tapping on Benazir's lack of awareness and invoking what Colin S. Gray (1971, p. 75) referred to as "national preparedness syndrome."

In 1997, an engine test for Shaheen-I was reported, indicating that NDC was getting closer to its goal of developing ballistic missile capability. This development is likely to have added to A.Q. Khan's anxieties. However, to his luck No-dong missiles, in both assembled and disassembled forms, began arriving the same year and by the next year Dr Khan was determined to have it flight-tested. According to Salik (2020), A.Q. Khan wanted to have a missile of his own to show that he can do it all, that PAEC was inefficient, and that he could have the missile developed much quicker. It is unclear as to when Dr Khan began proliferating centrifuge technology to North Korea, but it is likely that seeing the progress being made in the missile development at NDC he may have extended centrifuge technology to North Korea to hasten the supply of No-dong missiles.

In April 1998, despite GHQ's recommendations not to conduct a missile test, Dr Khan hastened to have Ghauri flight-tested. Shaheen-I's engine test may have been crucial in this decision as well. Dr Khan had Prime Minister Sharif greenlight the No-dong/Ghauri's first flight-test, not only allowing the late starter KRL to engineer a shortcut to victory in the interorganisational missile race with NDC/PAEC by a full year but also win the popular acclaim (Clary, 2005, pp. 62 & 71). In addition to claiming the "father of the bomb" title Dr Khan soon began identifying himself as the inventor of Ghauri in a bid to establish himself as the "father

of the missile programme" as well. Predictably, the flight-test had both external and domestic implications.

Although Ghauri's first flight-test was a failure, it provided good enough of an excuse for India to conduct its nuclear tests and restart its Agni missile programme. Prime Minister Sharif convened the three Defence Cabinet Committee (DCC) meetings between 11th-15th of May 1998 for deciding on Pakistan's response, during which the nuclear establishment's bureaucratic politics came to foray in its worst form. The question of whether PAEC's nuclear device would be tested or KRL's was perhaps as problematic as the question of responding to Indian test. Prime Minister Sharif delegated the choice to General Karamat who ruled in PAEC's favour (F. H. Khan, 2012, p. 272).

However, Dr Khan protested General Karamat's decision. A compromise was formulated whereby a team of KRL, including Dr Khan, will be invited to the test site at Chagai in Baluchistan province, which had been prepared by PAEC. After the successful nuclear tests by PAEC, A.Q. Khan called a press conference to declare that he had succeeded in exploding the nuclear devices. Apparently, PAEC and Pakistan Army's CD Directorate had not made Dr Khan privy of the complete details on the nuclear tests. Dr Khan issued a statement that two devices were tested on 30th whereas the MOFA clarified that only one device was detonated. Nevertheless, Dr Khan continued to present himself as the "Father of the Bomb" in the public, which many till date believe to be true (Nawaz, 2008, p. 496)

In the wake of the 1998 nuclear tests, the missile race between KRL and NDC exacerbated. For a duration, the competing missile programmes appear to have set the pace of innovation than external threats. On 14th April 1999, Ghauri's second flight-test was conducted followed by Shaheen-I's maiden flight-test on 15th April 1999. It is unclear if the back-to-back flight-tests were deliberate, but Pakistan Television ran a side-by-side video slide of the two missiles' launches, demonstrating greater thrust of the solid-fuel propellent of Shaheen-I to the laymen. A.Q. Khan and Dr Mubarakmand also took their spat to the public by berating each other's missile programmes in press conferences and planted publications. While Dr Khan was no newcomer to the press, as he had consistently utilised the medium to build up his image, Dr Mubarakmand's public reach out was a break from the past approach of PAEC/NDC for maintaining relative silence (Hoodbhoy, 2013b, pp. 104–105).

Sharif government's rumoured investigation into missing Ghauri missiles in 1999 has further raised questions about the role of Dr Khan's rivals from NDC/PAEC into convincing the Prime Minister to take this course of actions. According to Siddiqa (2001, p. 188), Dr Mubarakmand, hailed from the same province as Prime Minister Sharif and this link provided the necessary ties that helped him develop a better rapport with the Prime Minister. Siddiqa questions, in a rather insinuating manner, the role Mubarakmand group in revealing this information to the government.

The toxic competition between KRL and PAEC/NDC came to its climax after General Musharraf took over and the three-tiered nuclear C^2 system had been created, which established oversight over the strategic organisations. However, the rancour appears to have instead shifted to between A.Q. Khan and Musharraf. Dr Khan would go onto blame Musharraf for sabotaging his missile programme by cancelling underdevelopment Ghauri-II MRBM and Ghauri-III IRBM. However, as stated before, General (R) Kidwai informed the researcher that these missiles were proposed but no developmental efforts had taken place.

7.2.4.1. Technological Imperative

The concept of 'technological imperative' underscores that military technology has a momentum of its own. According to the UN Study on Nuclear Weapons, "it is widely believed … that new weapons systems emerge not because of any military or security considerations but because technology by its own impetus often takes the lead over policy, creating weapons for which needs have to be invented and deployment theories have to be readjusted" (*General and Complete Disarmament: Comprehensive Study on Nuclear Weapons*, 1980, p. 32).

This explanation does not fall too far from the 'autism' theory of arms dynamic. However, unlike the autism the technological imperative concept or model does not necessarily dispel the role of ARM. According to Buzan and Herring (1998, pp. 121–122), action-reaction processes probably serve as a general stimulant to the technological imperative. Insecurity (and, beyond that pursuit of power) means that more resources are pushed into advancing military technology than would otherwise be the case. The two authors further state that the ARM clearly provides a strong motive for states to

institutionalise military R&D, and that once established these sectors become both an independent input into the arms dynamic and a part of the idiom in which some states compete with each other.

R&D institutions, scientists, and engineers are the central forces behind technology. According to Rathjens (n.d., p. 77), there is an "insatiable curiosity that characterises all true scientists: the almost imperative need to seek new knowledge and to trace through the implications of every discovery and every piece of evidence." Farrell (1997, p. 6), argues that even where the pace of technology does not by itself drive weapons acquisition, the promise of technology is given voice by the scientists who become entrepreneurs and push their technologies upon an eager military establishment.

An interesting question would be whether technological imperative holds any relevancy in the case of part-producer states whose technological capacity is significantly less than that of the major producers. Interviews conducted for this research suggest that the concept or the model has had some significance in the case of Pakistan's ballistic missile programme. In his interview, Salik explained that the scientists prefer unrestricted R&D programmes and more resources for sustaining those programmes to ensure their organisational preservation. Thus, they come up with new ideas and technologies and then try to convince the policymakers to finance them, who in turn get to take credit for contributing to the national security.

General (R) Kidwai confirmed to the researcher that, in Pakistan's case, there were very often things that offered to lead to [new] openings, especially when there were improvements in technology. He explained that the Pakistani scientists often come up with "very fine options and solutions, including futuristic ones." General (R) Kidwai further added that it is only prudent for the DG SPD or the tri-services chiefs to consider emerging technologies like the artificial intelligence (AI) and hypersonic missile systems and set the course for achieving these futuristic visions in the present.

The institutionalising of a C^2 system, particularly the establishment of the NCA and SPD, and its oversight of the missile programme, however, appears to have reined in certain particularities of the technological imperative emanating from the weapons laboratories by

restricting focus to missile systems that fulfilled the operational requirements. General (R) Kidwai explained that only the technologies or capabilities that had operational relevance would receive approval. He stated that his consideration always was whether the [proposed] technology or capability would fit into the [missile] programme, and if it served the operational goals. If it did not adhere to the parameters of the CMD or FSD doctrinal policies that Pakistan followed then they were perhaps not needed, at least, for now.

However, exceptions would be made if the proposed technology or capability was deemed to become relevant to operational goals and doctrinal policies in the future, and if they could be delivered in the specified period, usually ten years. If not, then the proposal would not be approved. Funds would be allotted to more pressing needs. General (R) Kidwai also stated that he discouraged the technological mimicking of other nuclear weapons states. It was irrelevant for Pakistan what the states like China or France were doing. The development had to take place in the South Asian or Indian context.

Although neither interviewee identified any missile system or proposed technologies and capabilities that resulted from the scientific and engineering curiosity or parochial organisational interests of the R&D institutions a logical example would be the proposed but 3000km-3500km range Ghauri-III that was concluded to be superfluous for Pakistan's operational requirements and rejected.

It is likely that as the technological capacity of the Pakistani weapons laboratories expanded and improved the scientists and engineers developed ambitious tendencies. However, it is unreasonable to conclude that in their scale or magnitude these tendencies were comparable to those found in more technologically advanced states. Moreover, unlike major producers, the administrative-military-scientific-complex that emerged in Pakistan between 1988-1999 did not resemble the MIC of the U.S. As Salik (2020) explained, the U.S. MIC is dominated by the private enterprises that spend billions of dollars in R&D and thereafter strive to recover their investments through means of lobbying with Congresspersons and the military establishment to convince the U.S. government to acquire their weapon systems. In Pakistan, he argued, the military industry and scientific R&D organisations are under government or state's domain. It's not the profitability but prestige factor between the rival laboratories that have governed the competition.

7.3. Nuclear C^2 System: Decision-Making from 1999-Onwards

Instituting of a C^2 System was expedited in the immediate aftermath of the May 1998 nuclear tests. The basic premise for such a move was not merely the necessity for such a system on a formal basis for operationalizing the nuclear forces but also the realisation that the prevailing mechanism was an unconsolidated system with scattered assets, and one which permitted scientific organisations and their leaders likes A.Q. Khan, Dr Ashfaq, and Dr Samar Mubarakmand to perform varying tasks, largely without [organisational] synergy. Merely weeks after the over nuclearization, COAS General Karamat deputed the task for conducting the study on a viable nuclear C^2 mechanism to the GHQ's *Evaluation, Analysis, and Research* (EA&R) cell being led by then Major General Khalid Kidwai.

General (R) Kidwai informed the researcher that the EA&R cell conducted studies and came up with a set of recommendations in two to three months' time. However, General Karamat resigned after developing disagreements with Prime Minister Sharif. Presentation on the C^2 mechanism was then presented to his successor, General Musharraf. Two presentations were given to General Musharraf in which he was informed of the three-tiered architecture of the proposed mechanism. This comprised of an apex decision-making body called the NCA, its secretariat the SPD, and the tri-services strategic forces, i.e., Army Strategic Force Command (ASFC), Air Force Strategic Force Command (AFSFC), and Naval Strategic Force Command (NSFC), as the custodian of the nuclear weapons.

General Musharraf approved of the proposed mechanism but recommended that since the issue was of national level it should be presented to Prime Minister Nawaz Sharif. In April 1999, a third presentation was thus given to Prime Minister Sharif and his entourage of senior ministers and advisors, comprising of Foreign Minister Sartaj Aziz, Finance Minister Ishaq Dar, advisor on foreign policy Tariq Fatemi, and few others at the GHQ's MO Directorate. However, Sharif left without formally approving the plan, tasking Sartaj Aziz to conduct further discussions on the subject. Since General Musharraf was also serving as the CJCSC, the *de jure* head of tri-services, and the proposed mechanism envisioned a tri-services strategic forces, he requested a fourth presentation to be held at the JSHQ for Air Chief P.Q. Mehdi, Naval Chief Admiral Abdul Aziz Mirza, and other military staff officers. According to

General (R) Kidwai (2022), the proposal was widely praised and accepted without reservations.

Although formal approval for establishing the NCA could not be achieved from the Prime Minister, General Musharraf nevertheless directed General Kidwai to commence work on establishing the C^2 structure or, at least, the SPD. The CD Directorate and AE&R cell were merged to form the SPD with General Kidwai as its Director General (F. H. Khan, 2012, p. 330; K. Kidwai, 2022). In October1999, General Musharraf took over after a military coup and in February 2000 NCA's creation was announced. Today the NCA serves the apex decision-making body on the strategic weapons programmes. The NCA comprises of two committees:

First, the *Employment Control Committee (ECC)*, which is a politico-military body with Foreign Minister serving as its deputy chairperson. The ECC's membership further includes Defence Minister, Finance Minister, Interior Minister, CJCSC, COAS, CNS, and CAS. The Director General Strategic Plans Division (SPD) serves as its secretary. The ECC serves as the main policy and decision-making body in the C^2 system. It monitors progress on strategic weapons development, reviews existing and emerging threats, and decides on responses to those threats. Formulating guidelines for ensuring effective C^2 practices, including on preventing accidental and unauthorised use of nuclear weapons, falls in the ECC's ambit (F. H. Khan, 2012, p. 334; N. A. Salik, 2009, pp. 235–236).

Second, the *Development Control Committee (DCC),* which is a military-scientific committee with the CJCSC serving as its deputy chairperson. Its membership further includes COAS, CNS, CAS, and heads of various scientific organisations involved in the strategic weapons programmes. The DCC is tasked with translating the ECC's decisions into developmental goals and overseeing their implementation. It is responsible for weapons development and oversight and exercises technical, financial, and administrative control over all strategic organisations (F. H. Khan, 2012, p. 335; N. A. Salik, 2009, pp. 235–236).

The SPD, the second tier of the C^2 System serves as the permanent secretariat of the NCA and assists its two committees and oversees the systematic progress of weapons systems. It formulates policy options for the NCA's approval and after the decision has been taken it manages its implementation. It oversees all managerial aspects of the strategic

weapons programmes, including administrative, budgetary, safety and security issues of nuclear entities (N. A. Salik, 2009, p. 236). With SPD's creation all strategic organisations and weapons laboratories were placed under it. The organisation established a military-style control, oversight, and accountability over the weapons laboratories, which PAEC, NDC, KRL, etc., had never been subjected to before (F. H. Khan, 2012, p. 335).

The third tier of the C^2 system are, as already identified, the ASFC, AFSFC, and NSFC, which serve as the custodians of nuclear delivery vehicles, with the ASFC possessing the ballistic missile force. While these strategic forces are tasked with military missions of deploying the nuclear delivery vehicles and launching nuclear strikes, the final authority for launching a nuclear strike is retained by the NCA, such a decision is reach through consensus within the NCA with the chairman (i.e., Prime Minister) casting the final vote (F. H. Khan, 2012, p. 335; N. A. Salik, 2009, p. 236).

The establishment of the C^2 system, particularly the SPD, however, met with some resistance from the top missile and nuclear bureaucrats like A.Q. Khan, Dr Samar Mubarakmand, and to a lesser extent from then chairman PAEC Dr Ishfaq Ahmad Khan. The new system shutdown the open-door policy for the top scientists to Presidents, Prime Ministers, or Army Chiefs – the mechanism that Dr Khan exploited to his advantage and one which enabled him to acquire No-dong and have it flight-tested. Their affairs were now to be managed by DG SPD junior in rank to these offices.

However, the more important question is of the level of participation of the civilian members of the elected government and the information provided to them on the strategic programmes. Based on the NCA's structure and available information of the NCA meetings, it is evident that the Prime Minister, by virtue of previously being the Vice Chairperson and later Chairperson, is a permanent presence in the NCA meetings and is briefed regularly. According to General (R) Kidwai, during his tenure as the DG SPD he would hold at least three to four NCA meeting every four months to brief the NCA members. Keeping the Prime Minister updated is also necessitated by the fact that they retain the financial prerogative. General (R) Kidwai explained that unlike the GHQ and governmental ministries where the finances and budgets are handled by principal accounts secretaries the SPD's annual budget is directly approved by the Prime Minister.

According to some of the interviewees, Prime Ministers, and other civilian members of the NCA are dependent on the guidance from the SPD and technical organisations for decision-making and are more likely to approve of proposals and plans based on SPD's recommendations and not necessarily through their own perspicacity. General (R) Kidwai explained that deliberating on particular aspects of the missiles systems, such as their types and ranges or targeting strategies, were indeed beyond personal capacity and capability of the civilian leadership, nor was it logical to expect that from them. In such issues and other matters of strategic concern they indeed relied on and trusted his guidance as the DG SPD and that of the other military leaders. It is pertinent to add that it is SPD's organisational responsibility to guide NCA's members in decision-making. However, General (R) Kidwai clarified that despite lacking the capacity to comprehend certain aspects of the missile [and the nuclear] programme Prime Ministers and other civilian leadership nevertheless demonstrated rational understanding on the concerned issues, actively participated in the NCA meetings, regularly provided their inputs during debates, and posed questions and answers.

Although the NCA and SPD are often criticised to be militaristic, in the sense that they are dominated by the military, the fact remains that the structure has made civilian leaders, particularly the Prime Minister, a permanent presence mandated by the policy. The military leaders can no longer pick and choose whom should be in on the strategic programmes and whom should be kept at arm's length, much as they did during the 1990s.

7.3.1. New Guidance for the Ballistic Missile Programme

The creation of the nuclear C^2 system, particularly the SPD, has had a profound impact on the ballistic missile programme. The dual-track ballistic missile programme commenced prior to inception of SPD. Thus, Ghaznavi, Shaheen-I, and Ghauri were not of SPD's choice but what it had inherited. The missile systems were in their infancy and not validated technologies at the time. It thus became SPD's job to not merely supervise the programme but also to perfect the systems, assign military mission to them, and lay out clear guidance for the future of the programme. General (R) Kidwai explained to the researcher that missile programme was essentially restarted from the scratch by the SPD, and it drove the programme to its

operational status. Below discussion focuses on some of the important decisions carried out by the SPD on the ballistic missile programme.

7.3.1.1. Missile Programme Re-Assessment

Army's CD Directorate is claimed to have conducted comprehensive analysis or assessments for ballistic missile acquisition and procurements of the foreign templates. However, beyond political considerations the assessments relating to operational requirements, as noted before, remain less clear. Feroz Khan in his interview suggested that the basic premise for acquiring the concerned templates, particularly No-dong, was to acquire whatever was available before the window of opportunity closes. Although it is claimed that Pakistan always planned on increasing the ranges of the missiles after absorbing technologies and in producing indigenous systems, even this plan appears to have been conceived without clear guidelines on what maximum range would suffice, and which of the two types of the missile capabilities could optimally serve the objective.

From the discussion with General (R) Kidwai, it appears that the proper operational assessments for ballistic missile acquisition were made only after the SPD had inherited the programme. In fact, General (R) Kidwai categorically stated that whatever planning started it happened with the establishment of the SPD. Based on the interviews conducted with the military personnel, but especially with General (R) Kidwai, some of salient features can be summarised as follow:

First, in congruence with the security rationale for acquiring nuclear weapons, missile capabilities were to be India-specific. In the Pakistani assessment there is no extra-regional threat that would warrant a strategic response. The strategic programmes are therefore exclusively driven by India-centric security compulsions.

Second, to have the missile programme go through the process quality and range enhancement. The overarching goal was set to acquire ranges that would cover Indian landmass in its entirety. For this purpose, missiles of tactical, operational, and strategic significances were to be developed. In giving a general overview General (R) Kidwai explained that in the India-Pakistan context 30km-90km could broadly be categorised as tactical

battlefield, 150km-200km can be categorised as operational battlefield, and beyond 200km can be categorised as strategic battlefield. In the Cold War terms the missiles could be identified as counterforce or countervalue systems. However, there are no hard and fast rules for identifying which missile system would serve in which battlefield and in which capacity.

In essence, Pakistani objective in the missile programme has been to acquire minimum of 30km range to maximum of 2750km range, and that objective has by and large been achieved with Nasr BFRBM with minimum of 30km range and Shaheen-III with 2750km maximum range. General (R) Kidwai insists that Pakistan does not intend on exceeding this maximum range, unless India somehow manages to extend its landmass.

According to General (R) Kidwai, the ranges of different missile systems are also not random but determined through mathematical logic where they are arranged sequentially and chronologically. He explained that there are overlaps between the minimum of the next system and the maximum of the previous system or where the maximum of one system ends the minimum of the next system starts. i.e., where Nasr has a maximum range of 70km then the minimum range of the next system, which is Abdali, is set to 60km-70km, and so on.

Third, as missile systems mature a simultaneous exercise of operationalisation should be carried out. General (R) Kidwai explained it was necessary to have balance of forces on the ground and it needed to be put on ground as soon as possible. To operationalise the missile forces SFCs were created, and level of their strengths were determined in terms size, quantity, targeting requirements, and geography in order to enable them to cover entire Indian landmass (F. H. Khan, 2012, p. 331).

Fourth, the missile programme needed to have future vision. According to General (R) Kidwai, Pakistani responses, whether pre- or post-SPD, are based on two essential elements. 1) the 'nature of threat' emanating from both the conventional and nuclear forces of the adversary, and 2) The 'strategic environment,' which is assessed in terms of prevailing situation as well as forecasting the future. It could be argued that basing response on future forecasting is likely to result in anticipatory reaction. This would then explain anticipatory missile developments by Pakistan.

According General (R) Kidwai, whether one refers to Pakistani response as anticipatory reaction or by any other term, it has been a conscious policy decision to always be a step ahead of India. So, at no stage should Pakistan be taken by surprise. He explained, "whatever they [Indian] were doing we would be a step ahead of them. You can take *Nasr* as an example against the Cold Start Doctrine, or Ababeel against the ABM. Whatever example you can think of we were always a step ahead of them. We were never surprised because we were looking ahead of them, … and [remain so] even today." This could further explain the weak reciprocal action-reaction relationship between the Pakistani and Indian ballistic missile programme since sequential response is not being actively pursued.

Fifth, the solid-fuel missile development was to be prioritised over the liquid-fuel. The decision was made after considering the advantages of the solid-fuel technology and having carried out a balanced analysis of cost-benefits, operational, technical, and logistical parameters, availability of funds and material, etc (K. Kidwai, 2022). However, this is not to say that the liquid-fuel Ghauri was phased out or side-lined, as its sparse number of flight-tests over the past few years have given the impression of.

According to General (R) Kidwai, Ghauri's technology had been validated and no further flight-tests were required for the purpose from the scientific or engineering end. Any further flight-tests are now subject ASFC's exercises. Based on the explanation provided on the range sequencing, since no solid-fuel missile of 1100km-1300km has been developed, Ghauri continues to operationally serve in this range slot. An important takeaway, however, is that despite internal-domestic orientation of Ghauri's acquisition the SPD has invested funds and resources to make improvements in the missile and make it operationally viable system.

General (R) Kidwai claimed that having gone through their training the ASFC has achieved confidence in the system and are able to launch the missile for their training without external assistance from scientists and engineers. However, explanations summarised in this thesis lead this researcher to conclude that no further advancements are planned in Ghauri and once the capability becomes obsolete the missile is likely to be phased out and not be replaced by another liquid-fuel ballistic missile. According to one source, despite modifications and improvements the missile retains its inherent limitations and problems and

is not as efficient as the solid-fuel missiles. However, the missile has a good range, can serve in a strategic or nuclear role, and would continue to be maintained until enough solid-fuel missile systems are acquired.

However, it seems that valuable technological experience has been gained from Ghauri's liquid-fuel propulsion and that it has potentially provided a technological spinoff benefit. In 2011, the NCA approved *Space Vision 2047.* An important ambition in this space programme plan is the development of a SLV. General (R) Kidwai informed the researcher that the SLV programme is a collaborative effort of SUPARCO, NESCOM (National Engineering and Scientific Commission), and KRL scientists and engineers and, to the best of his knowledge, it comprises of technological combination of solid-fuel and liquid-fuel propulsions, experience for which has been gained from the missile programme.

General (R) Kidwai, however, insists that the SLV programme is strictly intended for launching satellites. He is cognisant of the fact that such a development may be misconstrued as Pakistan's intention to enhance its missile ranges. Such an assumption, according to him, would be erroneous as Pakistan does not need any missile of any range beyond what it already has achieved and that the [missile] delivery system programme for nuclear purposes is concluded up to Shaheen-III.

7.3.1.2. Missile R&D Re-Organisation

After its inception the SPD also began investing in missile infrastructure and further began reorganizing the R&D organisations. There was renewed emphasis on indigenisation. General (R) Kidwai explained that anytime a technology was found to be lacking infrastructure was put in place to develop it. In the process a huge infrastructure was established. Since priority was assigned to the solid-fuel programme NDC, PMO, AWC, as well as Maritime Technologies Complex (MTC) – the four organisations working on solid-fuel technologies – were merged to form NESCOM. The new organisation was to serve as the focal point for the development of solid-fuel missile systems under the leadership of Dr Samar Mubarakmand. The liquid-fuel Ghauri was left to KRL.

According to Salik (2020), the four concerned organisation had been carrying out certain R&D activities that overlapped with each other, resulting in duplication of effort. Often these organisations wanted to produce weapon systems or import certain items, which were either already in works with other organisations or already imported by them. This further necessitated that they be merged to cut out duplication and conserve scarce resources. According to General (R) Kidwai (2022), NESCOM proved to be a well-coordinated and cost-effective solution, financially, materially, and technologically.

Besides merging the four R&D organisations working on solid-fuel missile systems, an important decision was made to encourage cooperation between otherwise competing KRL and NDC/NESCOM to find solutions to Ghauri's technical deficiencies. According to one interviewee, General Musharraf had at one point enquired about the lack of telemetry in Ghauri, and why the NESCOM/NDC, which had the technology was not sharing it with KRL? The source explained that KRL refused any assistance from its rival and that it was only after A.Q. Khan's retirement that cooperation was made possible and the NESCOM helped KRL with modification and improvements in Ghauri's telemetry, re-entry, and guidance system.

While General (R) Kidwai confirmed that cooperation between KRL and NESCOM/NDC took place, he denied the reports of friction or hostility on this matter. He explained that this happened under his supervision, whilst A.Q. Khan was still heading KRL, and that General Musharraf, in fact, had no role in this. He explained that there were problems with Ghauri that posed difficulties in flight-testing it. A.Q. Khan promised to resolve the issues in three months but ended up taking six. However, the flight-test was still not successful and the problems persisted. Dr Khan then requested one more year, but this was deemed too long.

General (R) Kidwai stated that in the greater national interest he suggested to A.Q. Khan that KRL should seek cooperation from NDC, whose Shaheen programme was progressing relatively successfully. A.Q. Khan initially did not like the idea but, according to General (R) Kidwai, when he assigned a deadline to him and informed him if KRL engineers were unable deliver in that period then he'll do something about it. Dr Khan eventually conceded, albeit reluctantly, to cooperate with NDC. Eventually, NDC and KRL engineers worked together to resolve Ghauri's issues, and when the next flight-took place, it was successful. General (R) Kidwai explained that Ghauri in service today is essentially a KRL

product but with a lot of technical inputs from NDC. One can even say that it's a joint venture between NDC and KRL.

7.4. Conclusion

Z.A. Bhutto's belief that nuclear programme would strengthen civilian control over the armed forces and that the civilian authorities could gain greater control over defense strategy and doctrine failed to lend credence as evinced by the military's subsequent control over the strategic programmes. The fact that despite being the chief executive of the country Benazir was not made privy of the nuclear programme or the developments of Hatf-I and II illustrates Prime Ministerial incapacitation in exercising authority on strategic weapons programmes, decision-making, regulation, and oversight and on other matters of national security.

The fundamental reason behind the Prime Ministers' failure to assert themself was the depreciation in the institutional authority of the Prime Minister's Office because of the decade long military rule of General Zia Ul-Haq between 1978-1988, during which constitutional changes were made to empower the military occupied Presidency over the Prime Minister and the parliament. Later when the democracy was reinstated, the military set unfair conditions for the elected governments to assume power. Both the Benazir and Sharif governments were also too disorganised and too busy squabbling with each other to consolidate themselves against the military. The civil bureaucracies' capacity to assist the elected governments in security matters in the face of military's overbearing power had also weakened because these reasons.

However, based on the case study from the dual-track missile systems, it appears that the military was not solely responsible for the procurement of the foreign ballistic missile systems as it sought solicitation from the elected Prime Ministers. Benazir was invited to negotiate the procurements of the Chinese and North Korean systems, whereas Sharif was able to influence the decision to flight-test Ghauri. This was, however, necessitated by the Prime Ministerial prerogatives on finances and state-to-state negotiations. Thereafter, however, there is no evidence of a comprehensive Prime Ministerial, governmental, or parliamentary role in advancing the dual-track missile programme.

According to Buzan (1987, p. 104), the most generally applicable elements of the DSM in the case of part-producers in the Third World are the existence of organisational pressures from the military establishment on weapons procurement. In the case of Pakistan, Buzan's hypothesis is largely vindicated and describes the Prime Ministerial predicament. Military's organisational pressure had been paramount driving force behind their decision to support ballistic missile acquisition. In resisting the military, the Prime Ministers risked debasing their respective governments and jeopardizing their political survival. The civilian leadership had thus conceded to the military's request unquestioningly and approved the acquisitions without having to evaluate the requested missile system.

Buzan (1987, p. 104), further adds that the demand for weapons is determined by the insecurity of the government in relation to its own citizens and that this factor is present to some degree in all countries. While there is evidence of domestic insecurities, particularly ones emanating from oppositional politics and public pressure, influencing Prime Ministerial decisions with regards to the strategic weapons programmes these are, however, mostly an offshoot of the broader civil-military tensions. Nevertheless, despite restrictions imposed by the military on the Prime Ministerial participation in the strategic weapons programme and related decision-making the Prime Ministers willingly extended their support for the missile acquisition not merely because of the military's organisational pressures but also because of their own parochial political interests. These interests can be summarised as follow:

First, it provided them with an opportunity, which was usually hard to come by, to participate in the strategic weapons decision-making and make contributions, minor though they may be, to these programmes.

Second, it demonstrated to both their electoral constituencies and oppositions that they were not out of the loop on the strategic weapons programmes and were committed to them. It helped consolidate their positions as national leaders to often tout their contributions to Pakistan's strategic weapons programme to appeal to their supporters. Benazir termed herself as the "mother of the missile programme," whereas, Sharif claimed that half the missiles in Pakistani military's arsenal were developed during his tenure and that he backed the reverse-engineering of the U.S. Tomahawk cruise missile to develop an indigenous version (Gulzar, 2020).

Third, the Army's ability to encourage negative competition between the ruling party and the opposition or directly intervene and oust the sitting governments instilled fears in the hearts of civilian leadership (Qamar, 2021; Siddiqa, 2001, p. 74). Thus, the elected governments believed that supporting weapons acquisitions, conventional or nuclear, would help keep the military satisfied and ensure their survival. This was, in one way, reinforced by Benazir when she stated that she facilitated No-dong's procurement because she wanted it to be known that she would not stand in the military's way (Levy & Scott-Clark, 2010, p. 442).

Paramount of these interests has been governmental stability and political survival. However, despite shaping their interests and policies in acquiesce to that of the military, neither Prime Minister was able to ensure their political survival as they were prematurely dismissed from their respective two terms. The lack of complete access and control over important aspects of the strategic weapons programmes severely constrained the civilian leadership's capacity to efficiently utilise the nuclear and missile programmes for other important domestic interests such as economic management or pork barrel politics for electoral purposes.

The Bureaucratic Politics Models posited by Graham Allison and Halperin suggest that parochial perceptions can lead decision-makers to hold a unique perspective on the national interest which may be completely at odds with competing notions of the national interest held by other policy actors (Allison & Halperin, 1972; Farrell, 1997, p. 11). In the Pakistani case we see that the military and the elected governments had indeed held competing notions of the national interests when it came to the nuclear and ballistic missile acquisitions and the direction of the country's foreign policy.

According to Sagan (2009, p. 465), the 1999 Kargil War provides strong evidence supporting the idea, rooted in organisation theory, that Pakistani military leaders held different views than the civilian leaders about the effect of nuclear weapons on the Pakistan-Indian rivalry. This thesis has largely repudiated the alleged nuclear preparations, particularly ballistic missile deployments, during the Kargil Conflict. However, the conflict nevertheless does reinforce divergent views of the military and the Sharif government on the role of nuclear weapons in India-Pakistan relations. The overt nuclearization provided the civilian leadership of the two countries with an opportunity to pursue nuclear peace process during

Lahore Summit in December 1998 – January 1999. However, the Kargil conflict, of which Sharif was allegedly unaware, derailed the process. Despite not undertaking nuclear preparations the conflict was initiated on the premise that Pakistan's possession of nuclear weapons would deter India from escalating the conflict beyond the Kargil's limited conflict theatre.

A more viable example is the military's attempt at subverting Benazir's efforts to develop cordial relations with the Indian Prime Minister Rajiv Gandhi in December 1988 by attempting to flight-test Hatf-I and II during his visit to Pakistan. During her second tenure Benazir emphasised on not exacerbating missile competition with India by developing and flight-testing long-range missile systems. This policy was reversed by Sharif to flight-test Ghauri. However, this resulted less from the military's organisational pressure and from the bureaucratic persuasions by A.Q. Khan. Ghauri's development and its first flight-test were by and large internal-domestic in nature, but its political implications were regional and international. The flight-test upset both the U.S. and India, resulting in the U.S. imposing sanctions against Pakistani and North Korean technical entities, and India making it an excuse to conduct nuclear tests.

By and large the military remained the dominant domestic institutional actor in weapons acquisition, whether conventional or strategic. Bhutto's assumption that the military would not arrogate to themselves the development of nuclear weapons is dispelled by the military's decision to undertake dual-use ballistic missile programme for developing nuclear delivery vehicles. Moreover, the choice of missile systems within the programme are also determined by the military. Important decision into the dual-track missile acquisitions were made by Pakistan Army between 1990-1993 exclusively and almost autonomously, with the Prime Minister only carrying out procedural obligations on its behalf.

There are, however, some positive aspects to military's determining role, particularly after the formation of the NCA/SPD mechanism, in the strategic weapons policymaking. It has helped counteract developmental problems like the ones faced by few other nuclear states, including India, where the design choices of the missile systems are often decided autonomously by the weapons laboratories to cater to their parochial organisational interests, and has instead enabled a consistent focus on the operational requirements (Z. Davis, 2009). Indeed, we see that Pakistan has capped the range ceiling of its ballistic missiles

to 2750km, which covers India entirely, instead of acquiring superfluous missiles systems in competition with India. Missiles exceeding this range would indicate either a parochial organisational or a political development or that military's threat perception has evolved beyond the region.

However, an exception in the Pakistani case is the design choice-making on and the subsequent acquisition of No-dong/Ghauri. While the CD Directorate is claimed to have recommended both the solid-fuel and liquid-fuel missile systems, the subsequent R&D organisational formations undertaken by COAS General Kakar indicate that the military strongly preferred solid-fuel missile systems. It seems that the acquisition of liquid-fuel was, above everything else, a necessary course of action to placate A.Q. Khan's beleaguerment over military's awarding of the solid-fuel missile programme to his competitors in NDC/PAEC and leaving him and his organisation without a delivery vehicle. What paved way for Dr Khan to influence the decision-making hierarchy were the institutional weaknesses of the civilian government to establish an effective control over weapons laboratories, and a lose system of supervision and oversight maintained by the military, which was eventually recognised by the military going into the creation of a formal C^2 system after the 1998 nuclear tests. The creation of the SPD had an immediate effect and helped contain the detrimental interorganisational rivalries amongst the scientific institutions and their leadership.

Chapter 8: Thesis Conclusion

Academic investigations conveniently describe Pakistan's behaviour in arming itself against India as 'arms racing' characterised with action-reaction process. However, if Pakistan's ballistic missile programme, especially in relation to that of India, is to be taken as a litmus test for this assertion it shows that the dyadic competition does not provide unconditional support for the classical theorems of the ARM. Evidence narrativised in this thesis shows that the *dynamic of Pakistan's ballistic missile acquisition* is less straight forward and more multifaceted than the available literature sets it out to be. India and Pakistan ballistic missile programmes have progressed with divergent objectives, with the Indian programme mostly geared towards achieving *prestige* and *great power status* and the Pakistani programme being, for the most part, *security* oriented. More importantly, this thesis has demonstrated that the 'causal relationship' between the Indian and Pakistani ballistic missile programmes is unconvincing. In essence,

The evidence proffered in *Chapter-5* indicates that convolution of political and military-technological triggers outside of the India-Pakistan dyad have been crucial cogs in the *causal mechanism* for Pakistan's ballistic missile programme. The *causation* of Pakistan's programme is in the foremost linked to its abandonment by the U.S. – its traditional, but also transactional and transitional, security partner – in 1990. The U.S. "triggered" Pakistan's acquisition when it made a political decision of invoking Pressler Amendment related sanctions against it, resulting in suspension of sale and support of F-16s. The aircraft provided Pakistan with coveted deep strike capability and served as the backbone of its conventional and nuclear deterrence. The embargo gradually increased the conventional disparity, especially in air power, during the 1990s as India gradually amassed advance combat aircraft.

China and North Korea willingly served as the technological "enablers" of Pakistan's solid-fuel and liquid-fuel to ballistic missile programmes, respectively. The China-Pakistan missile cooperation was incentivised as much by their mutually exclusive desire for the defiance of the unfair – as they perceived it – U.S. non-proliferation policy that impinged upon them as their mutual interest in countering India. A similar case of defiance of the U.S. is also observable in the case of North Korea-Pakistan cooperation. However, financial incentives possibly outweighed the political considerations in North Korea's decision to assist Pakistan.

The acquisition of ballistic missiles from two U.S.-weary sources provided Pakistan with means to establish independence in its nuclear and military antagonism with India without having to rely on any of the U.S. military hardware.

The politico-military characteristics of ballistic missile acquisition from the two U.S.-weary sources reinforces the some of the arguments presented on arms dynamic of Global South from *Chapter-1*. For instance, the Sino-Pakistan and Pakistan-North Korea cooperation defied the U.S. non-proliferation agenda and provided Pakistan with capacity to build-up its military capability independent of embargo prone U.S. military hardware. In theory, it also provided Pakistan with capacity to minimise the U.S. influence and prevent its intervention in India-Pakistan hostilities. However, empirical evidence in *Chapter-6* negates this argument and indicates that ballistic missile flight-tests have been purposely used to invite the U.S. intervention.

Over the years, the Chinese role in the Pakistani ballistic missile programme appears to have subsided substantially and cooperation with North Korea does appear to have ceased. *Chapter-6*, on the other hand, demonstrates that the U.S. continues to serve as a prominent external political, military, and technological catalyst in the Pakistan-India dyadic arms competition and has indirectly inflated the competition and influenced certain developments in the Pakistani missile programme beyond its early role in its *causation*. In the early 2000s, the U.S. began subordinating its non-proliferation policy in the region in favour of other foreign policy objectives, such as containing China and War on Terror (Carranza, 2016, p. 22). To muster Indian support for containing China, the U.S. eventually abandoned its non-proliferation policy towards the country and instead sought to provide it concessions to bolster its nuclear capability.

The convergence of the U.S. and Indian interests and the U.S. nuclear concessions to India have perhaps exercised greater influence in shaping Pakistan's strategic weapons programmes than they have perhaps on China's. The NSG wavier to India and the subsequent Indo-U.S. nuclear deal resulted in Pakistan accelerating its nuclear fissile material production and as evinced in the *Chapter-6* the prospective Indo-U.S. cooperation on BMD/ABM systems factored heavily into Pakistani decision to diversify its missile programme into the realm of cruise missiles. As the U.S. foreign policy pivots further towards India it threatens to open

new chapters in the India-Pakistan arms competition. Despite having achieved a major power status India remains a part-producer dependent on foreign suppliers for advance military technologies. Its indigenous nuclear and missiles capabilities may yet still be quantitatively and qualitatively insufficient to balance the Chinese power. To help India overcome its deficiencies the U.S. continues to indirectly facilitate its nuclear and missile capabilities.

In 2016, with the U.S. support India was accommodated membership into the MTCR, the regime that had been partly established in response to India's missile ambitions. India's inclusion in the regime is likely to provide it with access to more sophisticated missile technologies from Western states and enhance its ongoing cooperation with Russia, which ostensibly remained restricted because of the MTCR restrictions. Already India has developed ALCM version of BrahMos cruise missile with Russian assistance, and in 2022 fired one inside Pakistani territory. Whether the act was deliberate or accidental remains unknown, but the incident does not fare well for Indian nuclear C^2 system. India has also acquired Russian S400 SAM, which previously would have been difficult to acquire because of the MTCR restrictions as it exceeds 300km range. The system also has the capacity to serve as an ABM system.

Ashley Tellis (2022, p. 256), one of the strategists of the Indo-U.S. strategic partnership, Indo-U.S. nuclear deal, and the de-hyphenation of India and Pakistan in the U.S.' South Asia policy, has recently proposed India-France-U.S. (INFRUS) arrangement whereby he encourages the U.S. to "midwife" an Indo-French agreement to help India to avail of the superb French naval nuclear propulsion technology to build up its sea-based deterrent. Whether the proposal comes to fruition or not, it is likely to exacerbate the India-Pakistan dyadic competition in the domain of SLBM and SLCM, and nuclear submarines to launch them with. Authorities in Pakistan have already begun perceiving this proposal as a threat and talk of expanding country's sea-based nuclear deterrent through SSBN acquisition, whenever the wherewithal for such a costly course may be available.

Given Pakistan's economic constraints it is unlikely to pursue this course in the near term. There nevertheless remains a possibility, distant though it may be, that the INFRUS could upon a new chapter in Pakistan-China nuclear cooperation with China compelled to oblige Pakistan's sea-based deterrence needs and lease one of its SSNs or SSBNs, alongside SLBMs, to Pakistan for containing India within the South Asian region. This, however, would

be subject to if or when it becomes feasible for China to divert one of its nuclear submarines along with delivery systems away from its U.S.-centric Pacific theatre.

These aspects underscore the fact that Pakistani missile programme inadvertently finds itself locked in a geopolitical 'strategic chain' characterised with global power politics where the U.S. strategy to inflate India's military power and bolster its nuclear deterrence against China puts Pakistan in a disadvantageous position and forces it to recalibrate aspects of nuclear and missile programmes to maintain the fragile regional strategic balance. It also encourages China to similarly inflate Pakistani military power to convolute India's two-front dilemma with more weightage assigned to its regional security concerns vis-à-vis Pakistan.

Even though the *causal phenomena* of Pakistan's dual-track ballistic missile programme have been external to India-Pakistan dyadic competition, the developments within the programme are exclusively catered toward addressing its India-centric security compulsions. However, Pakistani missile developments do not adhere to mimicking/mirroring and reciprocal theorems of arms race. Pakistani programme has progressed independently of and decoupled from the developments in the Indian ballistic missile programme. Pakistan has not followed India's footsteps for developing longer-range IRBMs and ICBMs, deeming them to be superfluous for its security and nuclear deterrence requirements.

Pakistan's missile flight-tests during crises and conflict period also reinforce the security orientation of the missile programme. It has conducted missile flight-tests during heightened tensions to dissuade India from escalating the crises/conflict into full-scale conventional war as well as to invite international intervention for diffusing the tensions. It is conviction of this thesis that the ballistic missile flight-tests as instruments of nuclear signalling have, thus far, optimally served the stated objective. Ballistic missiles have added credibility to Pakistan's nuclear weapons, as well as to that of India's, and it could be argued that the possession of these strategic weapons have imposed a mutual caution.

The *balance of terror* established by the strategic weapons in South Asia is, however, delicate and under constant test by regional *stability-instability paradox* and India's ambitious mimicking of the major powers' nuclear arsenal. Strategic weapons have averted major wars between India and Pakistan, but they appear to have paved way for indirect and limited

conflicts. While Pakistan instigated Kargil Conflict a little after two countries' overt-nuclearization, India has been planning its own limited war plan under nuclear overhang through the Cold Start Doctrine. India has also mimicked and received technical and political support from countries like Israel, Russia, and the U.S. for its BMD/ABM programme, which in theory could embolden it to conduct misadventures in the future.

Trepidations arising from these 'radical qualitative' developments in India's nuclear and conventional warfighting plans has forced Pakistan to diversify its missile force by introducing triad of Babur and Ra'ad series of cruise missile, Nasr BRBM/TNW, and Ababeel MIRV ballistic missile to prevent the strategic balance from completely tilting in India's favour. Together with longer-range missile systems Pakistani cruise missiles and Nasr form part of what Pakistan terms as FSD, a posture that comprises of a large variety of strategic, operational, and tactical nuclear weapons, on land, air, and sea, and are intended to comprehensively deter India on strategic, operational, and tactical levels of warfare ("A Conversation Gen. Khalid Kidwai," 2015; K. Kidwai, 2020).

Speaking strictly in terms of the ballistic missiles, while the 70km range *Nasr* is formally identified 'tactical level capability' and the 180km range Abdali is touted to be an 'operational level capability' the relatively longer-range ballistic missiles from the dual-track programme offer 'strategic level capability.' However, barring Nasr, there is no hard and fast rule as to which missile system would serve at what level (K. Kidwai, 2022). Abdali for instance can also serve in strategic role since it is able to target Indian urban centres situated near the border and Ghaznavi could be employed against military facilities situated in 300km radius. The 2750km range Shaheen-III is expressly intended to target Andaman and Nicobar Islands not because they have any countervalue significance but because of their counterforce/military significance. Such a mission would qualify Shaheen-III as an 'operational level system,' despite it being the longest-range ballistic missile in Pakistan's inventory.

Some commentators perceive FSD as deviation from Pakistan's previous CMD posture, assuming that it would necessitate large nuclear forces and for this reason it also typifies change in the Pakistani posture as arms racing. Salik (2018, p. 218), however, argues that FSD arsenal will be modest in size, albeit with a wide variety of delivery systems, including short- and medium-range ballistic missiles, cruise missiles, and aircraft delivery systems. Speaking in

2015, General Kidwai (2015), explained that FSD did require modifying the numbers, but new numbers should suffice for ten to fifteen more years and that beyond a certain number the logic would be lost. This indicates that revised limits are imposed on increments in Pakistani nuclear forces and that FSD does not insinuate an open-ended race.

Arguments presented in this thesis are somewhat in conformity with these assertions. This thesis underscores that CMD is flexible and 'minimality' is readjusted in proportion to the growth of Indian military power. Diversification of nuclear forces under FSD necessarily requires qualitative and quantitative shifts in CMD to meet the changing demands of maintaining regional strategic stability. The limits to increment are, however, difficult to ascertain. The number of warheads and delivery vehicles remain unknown, but qualitative characteristics of missile systems, especially their ranges, adhere to certain limits and have not exceeded Pakistan's India-centric requirements. Some experts have even identified FSD as an add-on to CMD, terming Pakistani posture as "Credible Minimum Full-Spectrum Deterrence" (Z. N. Jaspal, 2018, p. 224).

There are indications that developments in the Pakistani nuclear and missile programmes have been premature or anticipatory. As cited earlier, Buzan and Herring (1998, p. 101), argue that anticipatory weapons development by a state indicates that it has restructured itself internally on a long-term basis for dealing with its arms dynamic. Academic literature summarised in *Chapter-1* explains that institutions that come into existence because of internal restructuring eventually gain a life of their own and can become inclined towards parochial interests in pursuing arms acquisitions, which may not necessarily be in conformity with concerned state's security demands. *Chapter-4* and *Chapter-7*, respectively demonstrate that Pakistan had organised itself on long-term basis by institutionalising nuclear and missile R&D and production facilities. The technical bureaucracies heading these facilities, along with other state actors, subsequently developed narrow inward views on the strategic weapons programmes.

Of the multiple actors identified in the chapter, Prime Ministers, Military, and Weapons Laboratories proved to be consequential in the acquisition process. Between 1988-1999, these three direct actors had virulent competitive relationships and disproportionate decision-making power between each other. While the three institutions worked through

each other – but not necessarily with each other – to accomplish the acquisitions, the decision-making and choice-making by these institutions were often not in conformity with national security requirements and, instead, tended to cater to mutually exclusive parochial domestic interests. It was out of this dynamic that what was supposed to be a single-track solid-fuel programme was obliged to develop into a dual-track programme with the addition of liquid-fuel component.

This thesis reinforces that the military was and, for all practical purposes, remains the dominant partner in the strategic weapons decision-making. The choice-making and internal restructuring for the solid-fuel programme was of carried out by the military. The primary consideration for the military – more specifically Pakistan Army – for the acquisition of dual-track ballistic missiles does appear to be security oriented, and their influence over the programme, especially with the creation of the SPD, has ensured a consistent focus on the operational requirements. All of Pakistan's ballistic missiles today are dual-use systems and none is intended for symbolism. There are, however, indications of narrow interests of Pakistan Army in pursuing the ballistic missile acquisition, such as breaking PAF's monopoly on nuclear weapons delivery vehicles and custodianship.

The military also solicited civilian Prime Ministers' participation in the ballistic missile acquisition. This was, however, necessitated by the constitutional structure of the Pakistani state, which vested financial and diplomatic negotiation with the Prime Ministers. The Prime Ministers, however, enthusiastically extended their support for the programme as it provided them an opportunity to contribute to the strategic weapons programmes from which they usually found themselves locked out of. They also had a belief that keeping the military appeased by facilitating their weapons acquisition would ensure governmental stability and survival. Based on the history of civil-military relations in Pakistan this belief was erroneous. Despite their unquestioning support neither Benazir Bhutto nor Nawaz Sharif was able to sustain their rule and were prematurely dismissed.

More profound has been the role of nuclear technical bureaucracies and their respective weapons laboratories, which had enjoyed considerable autonomy in their workings since the removal of Z. A. Bhutto. Lacking technical expertise, the Army is believed to have left technical matters in the hands of the relevant experts (Siddiqa, 2001, p. 188). The

civilian leadership had been at an even greater disadvantageous position in establishing control over the scientists and laboratories because of their limited participation in strategic weapons programmes during the concerned period. The limited oversight of the military and lack of control of the civilian governments provided the scientific leadership with considerable leeway in shaping the strategic weapons programmes.

At first glance, above arguments underscore that explanations or generalisations from DSM hold considerable weightage in the Pakistani case. However, particularities observed in the Pakistani case posit a different experience than those observed in the cases of the U.S. and the Soviet Union, and therefore may require revisiting of DSM explanations or generalisations proffered by some scholars, including Buzan and Herring. The Pakistani administrative-military-industrial-scientific complex that existed between 1988 and 1999, operated on a considerably different political agenda than the traditional MIC of the U.S. or the Soviet Union. On the face of it, *institutionalisation of nuclear and missile R&D and production* do explain Pakistani dynamic. However, complications arise from the fact that the Pakistani weapons laboratories were and remain state owned and therefore virtually have no commercial interest in the missile programme, though budgetary considerations may be of significance.

Much as Pakistan was operating in a complex strategic regional environment its domestic environment was also of considerable dynamism characterised with disproportionate power sharing in the civil-military relations – a dynamic taken for granted in the case of Cold War superpowers and present global powers. Military's dominance in decision-making and its undercutting of civilian leaderships' authority and participation in the strategic decision-making severely constrained the latter's capacity to efficiently make use of the strategic weapons programmes for its own narrow interests based on *economic management* and *electoral politics.*

The standout acquisition for DSM analysis in the Pakistani case is that of Ghauri. The internal-domestic factor that best explains the acquisition is the 'idiosyncrasies' of various institutional heads, particularly of A.Q. Khan. It is evident from the thesis that Pakistan Army's choice-making almost exclusively preferred solid-fuel ballistic missiles. However, liquid-fuel No-dong/Ghauri was introduced midway primarily on the insistence of A.Q. Khan. The

underlying reason was Dr Khan's competition with his rival organisations, PAEC and its subsidiary NDC, for the control of the strategic weapons programmes. This thesis thus contends that Ghauri's acquisition resulted more from internal-domestic dynamic than security reasons. Given this fact an important question to ask would be, *what was the consequence of Ghauri's acquisition?*

According to Glaser (2000), when a state decides to engage in an arms race because this is its best available option for achieving its international goals, given the constraints imposed by the international system, the state is acting rationally, the causes of the arms race are external, and the race has no consequences of its own. In contrast, when a state builds up arms because domestic interests have distorted its policy, the state is acting sub-optimally, the causes of the arms race are internal, and the race itself produces negative consequences. However, if one is to accept that ARM and DSM are complementary to each other then there cannot be two different sets of consequences for weapon systems whether resulting from external or internal arms dynamic. In his analysis on the superpower arms race, Gray (1971, pp. 39-40, see Gray's footnotes) opined that it seemed to him that defense decisions taken to appease domestic lobbies may have the same consequences as if they were unambiguously competitive in the arms race context. Based on the discussions in this thesis, particularly *Chapter 6*, it would seem that Gray's assumption holds considerable weightage in the South Asian case.

To recall *Chapter 1,* states' reactions are based less on any real time or accurate intelligences and more on their threat perceptions and assessments regarding adversary's intentions and capabilities. It would be difficult for a state to distinguish between a weapon system that has been acquired by its adversary to appease its domestic lobbies and one that has been acquired as a rational response choice. While this thesis is of conviction that No-dong was acquired to placate A.Q. Khan and that the technology was suboptimal, India, however, does not appear to have had an accurate intelligence about the missile's technical deficiencies, and Pakistan thereby managed to utilise it as a rationale tool for nuclear signalling during the 2001-2002 Standoff. Given Ghauri's long-range and the fact that its flight-capability had been demonstrated previously, unlike the solid-fuel systems that were flight-tested for the first time alongside it during the standoff, the missile's role in sending message

across cannot be denied since for India the consequences of being wrong may have been very severe.

The military's rational utilisation of Ghauri during the 2001-2002 standoff underscores the element of "where you stand is where you sit" on institutional level, especially after the coming to being of the SPD. A.Q. Khan's motivations may have been his organisational rivalry with his counterparts in NDC/PAEC and to steer the strategic programmes singlehandedly. However, for the SPD, given its organisational routine, operational requirements were the paramount consideration in sustaining missile developments, including that of Ghauri. Given the impression that the missile's capability was not fully optimal with the renewed assessments made in the missile programme the focus was then diverted to solid-fuel systems.

In a nutshell, the above discussion show that the dynamics of Pakistan's ballistic missile acquisition exemplifies the broader claim about complementarity between ARM and DSM. The acquisition of Ghauri in particular reveals weakness of ARM as a mutually exclusive explanatory framework in the Pakistani case. The acquisition instead plays out in ways that can only be understood when ARM explanations are complemented with those of from DSM. In essence, Pakistan's primary consideration in initiating dual-track ballistic missile programme had been to bring back balance to the increasing military disparity with India in the 1990s, which was brought on by the U.S. military embargo. After the decision had been made to acquire ballistic missiles and internal restructuring carried out for the purpose, interests of institutional actors intervened to influence and shape the missile developments, forcing what was intended to be a single-track solid-fuel programme to transition into dual-track programme with the addition of liquid-fuel component.

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