The Politics of Nuclear Weapons
Different reasons for ‘going nuclear’
Vertical and horizontal proliferation
The nuclear proliferation debate in the second nuclear age
Nuclear latency and virtual nuclear arsenals
Key points and guide to further reading and resources

Given that the technology and know-how needed to build nuclear weapons has existed since the 1940s, it has come as a surprise to many that only a small number of states have sought to acquire or have acquired the bomb. Indeed, US President John F. Kennedy warned in a March 1963 speech that as early as the 1970s some 25 states might have acquired the bomb,¹ and throughout the nuclear age there have been many dire warnings of rapid proliferation to new actors. The reality is that while the number of states that possess nuclear weapons has increased (gradually), this has generally been much lower than people had dared to hope, and has actually been surprisingly limited (averaging just over one per decade since the 1940s). The reasons why such a relatively small number of states have chosen to acquire the bomb are mixed, as are the reasons why so many states that might have chosen to build the bomb – including those with the necessary facilities and expertise – have decided not to. At the same time, the implications of nuclear proliferation remain the subject of considerable
debate. Do nuclear weapons help keep the peace, as has been suggested that they did during the Cold War? Or is the spread of nuclear weapons an inherently bad thing that increases the likelihood of accidents and nuclear use, particularly in what has come to be termed the second nuclear age? It is therefore the purpose of this chapter to begin to think about why states have decided to build or not to build the bomb, how the bomb has proliferated, and what this means for international security and stability – and finally, the problem of nuclear latency whereby a number of states are theoretically in a position to build the bomb should they choose to, but have not necessarily contravened any laws or regimes.

This chapter proceeds in four sections: the first introduces the various conceptual models that seek to explain why states decide to build and keep nuclear weapons; the second chronicles the vertical and horizontal proliferation of nuclear weapons since 1945, charting the growth in nuclear actors and the fluctuations in global nuclear stockpiles across this period; the third examines the debate over whether nuclear proliferation stabilises or destabilises international politics and assesses this in the context of a transition to a new ‘second’ nuclear age; and the fourth considers the phenomenon of nuclear latency, whereby a state can manoeuvre itself into a position whereby it could build nuclear weapons if it decided to, but ultimately (at least for the moment) chooses not to do so. The chapter then finishes with some key points and a guide to further reading and resources.

(1) Different reasons for ‘going nuclear’

Conventional wisdom would suggest that states choose to build nuclear weapons because they believe that it is the best way to ensure their national security against an external threat in an inherently anarchical international system. By implication, states not faced with an overwhelming threat to their national security therefore choose not to build nuclear weapons. This model certainly has some validity, and it is difficult to cite any case of nuclear acquisition, or even potential acquisition, that was not driven by some aspect of national security:

- The United States built the bomb to end the Second World War.
- The Soviet Union built the bomb because it felt threatened by the United States.
- The United Kingdom and France did so because they felt threatened by the Soviet Union.
- China built the bomb because it felt threatened by both the United States and the Soviet Union.
- Israel built the bomb because of the threat from its Arab neighbours.
India did likewise because it felt threatened by China.

Pakistan built the bomb because it felt threatened by India.

North Korea followed suit for fear of attack by the United States.

Iran might be building nuclear weapons because it also fears attack from the United States and possibly Israel (see Chapter 6).

However, national security is clearly not the only dynamic shaping nuclear calculations. Indeed, it is equally hard to cite many cases (with perhaps a few exceptions, Israel and North Korea possibly among them) of a state that desperately needs to retain its nuclear weapons for immediate existential national security reasons in today’s world. More often than not the threats to national security have either changed since each of these states decided to build the bomb, or those threats have been managed in better and more credible ways than simply through the threat of nuclear use. Indeed, it is also clear that other factors were at play in these decisions to build the bomb.

As such, and in addition to the national security driver of nuclear acquisition (for more on this see Chapter 4), we must also consider other factors that drive and shape a state’s approach to nuclear weapons. Instead, or in addition to a perception of immediate or future existential national security threats, such decisions are often taken based on powerful domestic and internal factors that may have relatively little relationship with external factors at all. As Scott Sagan points out:

Nuclear weapons, like other weapons, are more than just tools of national security; they are political objects of considerable importance in domestic debates and internal bureaucratic struggles and can also serve as international normative symbols of modernity and identity.²

Or as Jacques Hymans argues:

decisions to go or not to go nuclear result not from the international structure, but rather from individual hearts. Simply put, some political leaders hold a conception of their nation’s identity that leads them to desire the bomb; and such leaders can be expected to turn that desire into state policy.³

In his seminal work on the issue, Scott Sagan suggested that the reasons why states choose to acquire and retain nuclear weapons should be broadened to include factors other than national security. As is explained below, Sagan added two new ‘models’ for nuclear acquisition in addition to national security. The three models loosely reflect the theoretical divide between realism, liberalism and constructivism in International Relations Theory scholarship.

• The security model suggests that states build and retain nuclear weapons primarily for reasons of national security, and in this way it fits squarely within the theoretical tradition of realism. In this scenario, state A would seek to
acquire nuclear weapons because of a threat to its national security from state B that could not be met by other means. As long as state B remained a threat, state A would retain nuclear weapons. Conversely, if state B did not represent a threat then state A would theoretically have no need for nuclear weapons.

- The *domestic politics model* suggests that irrespective of threats to national security, states might choose to build or retain the bomb due to certain internal domestic and bureaucratic interests. An example of this may be the use of the nuclear issue by one political party or interest group within a state for popularity or electoral purposes. Another may be the importance placed on a nuclear programme by a particular governmental department, large industrial corporations, the military, or even a specific branch within the military.

- The *norms model* suggests that nuclear weapons may be sought and kept due to the particular value they are seen to have for a state’s prestige and national identity. In this scenario, nuclear weapons represent national strength, modernity and vitality, and even provide ‘great power’ status.

One further reason widely cited for why states build the bomb, but not included in Sagan’s framework, is *technological determinism*, whereby a nuclear programme is the result of increases and developments in technology that shape nuclear thinking (driven by supply-side rather than demand-side pressures). In this model, technological developments – irrespective of security, politics and identity – drive the acquisition of nuclear weapons and the development of more and increasingly powerful and capable warheads and delivery systems. In this sense, a nuclear weapons capability becomes almost a natural extension of an advanced military–industrial complex and civilian nuclear capability. However, the fact that a large number of states that could theoretically have built a bomb but have chosen not to provides a powerful counterpoint to the notion of technological determinism. As Jacques Hymans points out, the ‘yawning gap between technical potential and military reality should have led to widespread re-thinking of the phenomenon of nuclear weapons proliferation’.

We can think of these ‘drivers’ of nuclear acquisition and retention as being co-constitutive, but often one driver has proven more important than others for the decisions taken by particular states. This is explained in Table 7. While these models have been analysed as being distinct, the reality is that the reasons that any state builds nuclear weapons – and chooses to keep them – are complicated, and may involve a mixture of all of the drivers described above. Equally, states that have chosen not to build the bomb will have done so for different and differing reasons – threats to national security notwithstanding. Nevertheless, the typology is a useful tool to think beyond a one-dimensional security-based understanding of why states might or might not choose to build nuclear weapons and of course retain them.
### Table 7  Models of nuclear weapons acquisition

<table>
<thead>
<tr>
<th>Model</th>
<th>Explanation</th>
<th>Theoretical Home</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Security</td>
<td>States build and retain nuclear weapons because their national security is threatened</td>
<td>Realism</td>
<td>The Soviet Union built nuclear weapons in the 1940s primarily due to concerns about the United States</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Israel built nuclear weapons in the 1960s due to the perceived threat from its regional allies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>France built nuclear weapons in the 1960s because it did not trust the United States to protect it against the Soviet Union</td>
</tr>
<tr>
<td>Domestic/</td>
<td>States build and retain nuclear weapons due to domestic parochial and bureaucratic interests</td>
<td>Liberalism</td>
<td>North Korea built nuclear weapons to protect itself from the USA</td>
</tr>
<tr>
<td>Bureaucratic</td>
<td></td>
<td></td>
<td>Domestic political influences are a key reason why the United States, United Kingdom, France and Russia have found nuclear reductions very difficult to agree, and stand as a major barrier to disarmament (see Chapter 5)</td>
</tr>
<tr>
<td>Politics</td>
<td></td>
<td></td>
<td>The decision by the United Kingdom to develop and maintain nuclear weapons is seen as being key to ‘great power status’</td>
</tr>
<tr>
<td>Norms</td>
<td>States build and retain nuclear weapons because of the prestige the weapons offer</td>
<td>Constructivism</td>
<td>Pakistan and India both saw nuclear weapons as a means by which to highlight their modernity and development</td>
</tr>
<tr>
<td>Technological</td>
<td>Nuclear weapons are a natural product of technological development</td>
<td>Structuralism</td>
<td>The Manhattan Project in the early 1940s made nuclear weapons acquisition by the United States almost inevitable</td>
</tr>
<tr>
<td>Determinism</td>
<td></td>
<td></td>
<td>Nuclear latency (see main text)</td>
</tr>
</tbody>
</table>

(2) Vertical and horizontal proliferation

Since 1945 nuclear weapons have proliferated in two ways: first, to a range of new actors – known as horizontal proliferation; and second, in the quantities possessed by the nuclear armed states – known as vertical proliferation. The aim of this section is to show how these two dynamics have fluctuated over the past seven decades, and demonstrate that while the number of nuclear actors has slowly increased, this has had relatively little impact on overall global nuclear warhead inventories (in fact recent trends have been towards more nuclear actors but less overall nuclear weapons).

Since 1945 it is estimated that approximately 128,000 nuclear warheads have been built by the nuclear armed states – a staggering number, particularly given the fact that until early 1998 only the USA, Russia, the UK, France and China were publicly acknowledged as having the capability to do so. Perhaps even more astonishing is the fact that close to 98 per cent of these bombs were built by either the United States or the Soviet Union between 1945 and 1991. While many of these weapons have since been decommissioned or/and or dismantled (or at least are awaiting dismantlement), large numbers are still theoretically usable or, potentially far worse, vulnerable to theft or misuse, and what to do with all the fissile material and irradiated bomb components produced since 1945 remains a serious global problem. Total global nuclear stockpiles peaked in 1986 at approximately 69,368 warheads, with well over 50 per cent of these in the then Soviet Union. Since this time, we have seen significant reductions in global nuclear stockpiles. Nevertheless the numbers remain alarmingly high, particularly the totals held by the USA and Russia.

Table 8 details how the numbers of weapons and numbers of actors have fluctuated since 1945.

<table>
<thead>
<tr>
<th>Year</th>
<th>Nuclear Armed States</th>
<th>Estimated Total Global Nuclear Stockpiles</th>
<th>Increment/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1945</td>
<td>1 (USA)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1955</td>
<td>3 (USA, Soviet Union, UK)</td>
<td>2,636</td>
<td>+2,632</td>
</tr>
<tr>
<td>1965</td>
<td>5 (USA, Soviet Union, UK, France, China)</td>
<td>37,741</td>
<td>+35,105</td>
</tr>
<tr>
<td>1975</td>
<td>6 (USA, Soviet Union, UK, France, China, Israel)</td>
<td>47,454</td>
<td>+9,713</td>
</tr>
<tr>
<td>1985</td>
<td>6 (as above)</td>
<td>63,632</td>
<td>+16,178</td>
</tr>
<tr>
<td>1995</td>
<td>6 (as above)</td>
<td>39,123</td>
<td>−24,509</td>
</tr>
<tr>
<td>2005</td>
<td>8 (USA, Soviet Union, UK, France, China, Israel, India, Pakistan)</td>
<td>26,388</td>
<td>−12,735</td>
</tr>
</tbody>
</table>
NUCLEAR PROLIFERATION: WHY STATES BUILD OR DON’T BUILD THE BOMB

<table>
<thead>
<tr>
<th>Year</th>
<th>Nuclear Armed States</th>
<th>Estimated Total Global Nuclear Stockpiles</th>
<th>Increment/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2015)</td>
<td>9 (USA, Soviet Union, UK, France, China, Israel, India, Pakistan, North Korea)</td>
<td>~16,300</td>
<td>–10,088</td>
</tr>
</tbody>
</table>


2Israel is believed to have developed nuclear weapons by this time, but did not publicly declare this (see Chapter 6).

The table above shows a number of interesting things about vertical and horizontal nuclear proliferation since 1945:

- The largest increase in global nuclear stockpiles (35,105) occurred between 1955 and 1965.
- Nuclear weapons building dipped noticeably to 9,713 between 1975 and 1985.
- The decade 1985–1995 experienced the biggest drop in global stockpiles – primarily due to the end of the Cold War.
- Cuts in global nuclear stockpiles since 1985 appear to be slowing – and further cuts beyond 2015 are likely to prove increasingly difficult.
- The number of nuclear actors has had relatively little – if any – impact on global nuclear stockpile numbers.

Essentially the table shows that during the early part of the Cold War, nuclear inventories expanded rapidly, particularly between the early 1950s and early 1980s, but that overall, numbers have decreased substantially over the last two and a half decades. It is also interesting to note that the US stockpile peaked much earlier than that of the Soviet Union/Russia (some 19 years beforehand), and that the increase in states with nuclear weapons has made relatively little difference to the overall number of weapons in the world. Many other states have had nuclear programmes and have chosen to abandon them during this period: the most notable are Argentina, Brazil, Libya, South Africa, South Korea, Sweden, Switzerland and Taiwan (see Chapter 9), while Syria and Iraq both had their respective nuclear weapons programmes curtailed by sanctions and force. As will be detailed below, some of these states (as well as notable others) retain a theoretical ability to build nuclear weapons should they choose to do so.

Both the spread of nuclear weapons to new actors and the increase in overall levels of nuclear weapons in the world present particular risks and dangers, and depending upon the view of which is more serious also suggest slightly different remedies. As Table 9 shows, the threat of horizontal proliferation requires enhanced non-proliferation efforts while the threat associated with vertical proliferation demands a greater push for nuclear reductions.
and disarmament. However, the two are of course linked: vertical proliferation may make nuclear weapons more attractive to non-nuclear armed states, while horizontal proliferation may make nuclear reductions less appealing for those who already have them. This is a central paradox of the nuclear international agenda, and is one of the key problems contained in the 1968 nuclear Non-Proliferation Treaty (this is explained in more detail in Chapters 5 and 7).

Table 9  Horizontal versus vertical proliferation threats

<table>
<thead>
<tr>
<th>Horizontal Proliferation</th>
<th>Vertical Proliferation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The spread of nuclear weapons to new actors</td>
<td>The acquisition of more nuclear weapons by current nuclear armed states</td>
</tr>
<tr>
<td>New nuclear actors may not be 'rational' or experienced as established nuclear powers</td>
<td>Large nuclear stockpiles make nuclear weapons more attractive to other states</td>
</tr>
<tr>
<td>More nuclear actors mean a greater chance of accidents, misuse, or even a deliberate nuclear exchange</td>
<td>More nuclear weapons mean a greater chance of accidents or misuse</td>
</tr>
<tr>
<td>Vertical proliferation can also lead to arms racing and subsequent instability</td>
<td>Vertical proliferation can also lead to arms racing and subsequent instability</td>
</tr>
<tr>
<td>More nuclear actors represents the greater danger</td>
<td>More nuclear weapons represents the greater danger</td>
</tr>
<tr>
<td>Nuclear non-proliferation needs to be prioritised (Articles I and II of the NPT.)</td>
<td>Nuclear reductions and disarmament need to be prioritised (Article VI of the NPT)</td>
</tr>
</tbody>
</table>

(3) The nuclear proliferation debate in the second nuclear age

The nuclear proliferation debate centres around one key question in international politics: does the spread of nuclear weapons increase or decrease global security and stability? As is explained below, this is at the heart of a fiercely fought intellectual argument between proliferation optimists and proliferation pessimists, and is a debate that has grown exponentially in importance as we have entered what has become popularly termed the second nuclear age. This section therefore seeks to address the following broader questions regarding nuclear proliferation:

- Will new nuclear states act with the same restraint as the more established nuclear powers?
- Did nuclear weapons keep the peace during the Cold War, and if so can this remain the case today?
- Does the spread of the bomb make future nuclear use – be it deliberate or accidental – more or less likely?
(i) Nuclear proliferation in the second nuclear age

Rightly or wrongly, it has become popular to conceive of the atomic age as comprising two separate periods: the first nuclear age, which was dominated by the superpower nuclear rivalry between the United States and ‘the West’ and the Soviet Union and ‘the East’, and lasted roughly from 1945 to 1991; and a second nuclear age, which emerged after the end of the Cold War (1991–), and involves more nuclear actors in a more fluid strategic context. While this first nuclear age was characterised by stability (at least in hindsight), the prognosis for the second appears far less sanguine. As Paul Bracken explains:

With a mixture of prudence and luck, the world made it through the first nuclear age without a nuclear disaster. Unless we prepare for the second nuclear age with a far more sober attitude, we may not be so lucky this time.9

The nuclear proliferation threat in the second nuclear age is addressed in more detail below.

At its most basic, the notion that we are now living in a second nuclear age is based on the idea that international nuclear politics experienced a comprehensive shift with the end of the Cold War. Rather than a world where nuclear strategy was played out through a bilateral world order (i.e. East versus West), and where only five states publicly deployed nuclear weapons, the second is instead characterised by the spread of the bomb and bomb-related technologies to new actors in a more fluid and nuanced international environment. In the words of Victor Cha:

The second nuclear age is substantively different from the first. In the first nuclear age, whether this term referred to the United States and the Soviet Union or the next tier of nuclear powers (Britain, France, China), there were fewer agents and, generally speaking, greater uniformity among them. By contrast, the second nuclear age is like comparing apples and oranges. Not only are the levels of proliferation greatly varied, but they differ on a whole range of dimensions.10

In the second nuclear age, the greatest nuclear risk no longer appears to be from a large-scale conflict between major powers (although this possibility always remains), but instead from regional instability or even non-state actors (for more on the non-state actor threat see Chapter 8). Again, in the words of Paul Bracken:

[the] greatest risk of nuclear war is in the regions, not between major powers against one another [South Asia, the Middle East and East Asia] ... how these rivalries play out will be one of the most important questions of the second nuclear age.11
This threat has been exacerbated by the spread of weapons of mass destruction (WMD) technology, and particularly the combination of nuclear power and ballistic missile capabilities to new actors across the globe.

Consequently, and while the first nuclear age was dominated by superpower rivalry between the United States and the Soviet Union, and predominantly by vertical proliferation, the second is characterised by horizontal proliferation and a new range of nuclear challenges. Indeed, in the past two decades three states have demonstrated a nuclear weapons capability, and others have either tried, or may be trying to do the same, and it is because of this that the nuclear threat appears to have shifted. These differences between the nuclear ages are contrasted in Table 10.

Table 10  The first and second nuclear ages compared

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actors</strong></td>
<td>The United States, Soviet Union, the United Kingdom, France, China</td>
<td>The USA, Russia, the UK, France, China, India, Pakistan, North Korea, Israel, Certain non-state actors</td>
</tr>
<tr>
<td><strong>Threat</strong></td>
<td>A large-scale nuclear war between the 'West', led by the USA and NATO, and the 'East', led by the Soviet Union and the Warsaw Pact countries</td>
<td>A regional crisis that escalates to the nuclear level. Nuclear weapons in the hands of non-state actors</td>
</tr>
<tr>
<td><strong>Causes</strong></td>
<td>A crisis/miscalculation between the superpowers - or their proxies - could result in a large-scale nuclear exchange</td>
<td>A small, perhaps unauthorised, regional nuclear exchange. A deliberate use of nuclear weapons for war fighting purposes by a state</td>
</tr>
<tr>
<td><strong>Themes</strong></td>
<td>The theory of mutual assured destruction was key to stability</td>
<td>Questions over whether MAD still remains fully applicable. Most new nuclear states do not have a secure second strike capability</td>
</tr>
<tr>
<td><strong>Focus</strong></td>
<td>Focus on arms control and nuclear reductions to address the nuclear threat</td>
<td>Focus on non-proliferation, nuclear security and disarmament to address the threat</td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td>This period was characterised by vertical nuclear proliferation</td>
<td>This period is characterised by horizontal nuclear proliferation (and vertical nuclear reductions)</td>
</tr>
<tr>
<td><strong>Summary</strong></td>
<td>Nuclear weapons helped keep the peace (or at least prevented major war) during the Cold War stand-off between East and West</td>
<td>The spread of nuclear weapons to more actors presents a new set of global challenges, and makes nuclear use more likely</td>
</tr>
</tbody>
</table>

Ultimately, the central theme of the second nuclear age is that the spread of the bomb to new actors – along with the means to build and deliver nuclear weapons – has changed the game, and consequently we may no longer be able to rely on the nuclear toolkit that helped us survive the first nuclear age. In the words of Fred Ikle:
NUCLEAR PROLIFERATION: WHY STATES BUILD OR DON’T BUILD THE BOMB

Half a century after it began, the nuclear drama has reached the conclusion of its first act – a rather happy ending in spite of the gloomy prospects for civilization that darkened the stage at the outset. This respite, though, is not a lasting redemption from the dangers of nuclear warfare.¹²

Fundamentally, the nuclear proliferation challenge in the second nuclear age rests on one central question: do nuclear weapons make international politics more or less stable and peaceful?

(iii) Optimists and pessimists: the Waltz-Sagan debate

Perhaps the most pivotal challenge of the second nuclear age is that presented by horizontal nuclear proliferation to new actors – a challenge quite different from the vertical nuclear proliferation by East and West that characterised much of the first. Consequently, arguably the most fundamental question of the second nuclear age is whether nuclear proliferation to new actors will stabilise or destabilise international politics, and whether nuclear proliferation makes interstate (and possibly nuclear) war more or less likely. This subject is at the centre of a debate between two leading political scientists – Kenneth Waltz and Scott Sagan. That debate can be succinctly explained as follows;

Kenneth Waltz argues that fear of the spread of nuclear weapons is exaggerated: ‘more may be better’ since new nuclear states will use their weapons to deter other countries from attacking them. Scott Sagan argues that the spread of nuclear weapons will make the world less stable: ‘more will be worse’ since some new nuclear states will engage in preventive wars, fail to build survivable forces, or have serious nuclear weapons accidents."³

We can think of this split as being between proliferation optimists and proliferation pessimists. Kenneth Waltz is seen as the champion of the nuclear proliferation optimists, and Scott Sagan of the pessimists. The central tenets of these two positions are explained below.

The proliferation optimists The nuclear proliferation optimists hold that horizontal nuclear proliferation in the second nuclear age should not necessarily been seen as automatically destabilising. As Kenneth Waltz explains:

Those who dread a world with more nuclear states do little more than assert that more is worse and claim without substantiation that new nuclear states will be less responsible and less capable of self-control than the old ones have been … Such fears have proved unfounded as nuclear weapons have slowly spread. I have found many reasons for believing that with more nuclear states the world will have a promising future."¹⁴
This is partly because:

New nuclear states will confront the possibilities and feel the constraints that present nuclear states have experienced. New nuclear states will be more concerned for their safety and more mindful of dangers than some of the old ones have been.\textsuperscript{15}

Ultimately, this viewpoint believes that ‘Nuclear weapons reasonably used make wars hard to start’.\textsuperscript{16} As such, the optimists hold that the spread of nuclear weapons – in certain circumstances – should actually be welcomed, and retaliatory nuclear deterrence does and should remain the bedrock of global nuclear relations.

The proliferation pessimists The pessimistic viewpoint, on the other hand, contends that horizontal nuclear proliferation can only ever lead to an increase in nuclear dangers and the possibility of nuclear use. Pessimists point to a number of factors that make horizontal proliferation potentially dangerous: the growth of nuclear terrorism and illicit networks (see Chapter 8), the possibility of nuclear accidents, problems with ensuring civilian control, and broader command and control of nuclear weapons (see Chapter 10), the spectre of preventive war against aspirant nuclear states (see Chapter 7), and the problem of building survivable second strike forces, amongst other things.\textsuperscript{17}

Foremost amongst these, however, is a critique of the misplaced belief that nuclear weapons helped keep the peace during the first nuclear age. In the words of Scott Sagan:

Deterrence optimism is based on mistaken nostalgia and a faulty analogy. Although deterrence did work with the [United States and] the Soviet Union and China, there were many close calls; maintaining nuclear peace during the Cold War was far more difficult and uncertain than U.S. officials and the American public seem to remember today.\textsuperscript{18}

Proliferation pessimists also focus on the problems of organisational culture and the ever-increasing threat of accidents and unauthorised use as the bomb spreads to new nuclear actors, ‘because of common biases, inflexible routines, and parochial interests’ that make ‘deterrence failures and deliberate or accidental nuclear war’ more likely.\textsuperscript{19} Consequently, pessimists argue that retaliatory nuclear deterrence may not represent the panacea that it is held to be by proliferation optimists. We can compare and contrast these views in Table 11 on the next page.

(4) Nuclear latency and virtual nuclear arsenals

While only a small number of states have taken the decision to build nuclear weapons, and while the vast majority have decided not to build nuclear weapons
Nuclear Proliferation: Why States Build or Don't Build the Bomb

Table 11 The proliferation debate

<table>
<thead>
<tr>
<th>Proliferation Optimists</th>
<th>Proliferation Pessimists</th>
</tr>
</thead>
<tbody>
<tr>
<td>'The more may be better' thesis</td>
<td>'The more will cause instability' thesis</td>
</tr>
<tr>
<td>The spread of nuclear weapons will induce greater stability since new nuclear states will use their weapons to deter other states from attacking them</td>
<td>Instability will result from more states acquiring nuclear weapons because of a greater potential for preventative nuclear wars and serious nuclear accidents</td>
</tr>
<tr>
<td>Nuclear weapons prevented a major war during the first nuclear age</td>
<td>We have avoided nuclear use so far due in large measure to luck rather than judgement</td>
</tr>
<tr>
<td>The nuclear terrorism threat is overstated</td>
<td>The nuclear terrorism/threat of unauthorised nuclear use is ever-present and will increase as the bomb proliferates</td>
</tr>
<tr>
<td>Actors are essentially rational, therefore more nuclear weapons will increase stability</td>
<td>More states with nuclear weapons make nuclear use more likely</td>
</tr>
<tr>
<td>Nuclear deterrence works</td>
<td>Nuclear deterrence is likely to fail in the future</td>
</tr>
<tr>
<td>An Iranian nuclear weapon could stabilise the Middle East</td>
<td>An Iranian nuclear weapon would fundamentally destabilise the Middle East</td>
</tr>
<tr>
<td>The likelihood for war decreases as nuclear deterrent capabilities increase</td>
<td>We must reduce the demand for nuclear weapons, strengthen the non-proliferation regime and work towards disarmament</td>
</tr>
<tr>
<td>Nuclear weapons make wars hard to start</td>
<td></td>
</tr>
</tbody>
</table>

at all, the peculiarities of nuclear technology mean that there exist a number of states theoretically capable of building nuclear weapons at short notice should they chose to, but which are not currently considered to be nuclear armed. These states possess their own civilian nuclear programmes, often including the ability to produce highly enriched U235 or to separate weapons grade PU239, and have a relatively advanced military infrastructure that could be used to develop a nuclear weapon (for more on this see Chapter 10). While these states may not be able to build a working bomb overnight (or in total secrecy), they could probably do so in a relatively short space of time should they choose to, although estimates of this vary from case to case and amongst experts. These states are known as virtual nuclear-weapon states or threshold nuclear-weapon states because they adopt a position referred to as nuclear latency. As Avner Cohen and Joseph Pilat explain:

Virtual weapons are indeed a reality of physics and cannot be ignored, because knowledge, experience, materials and other requirements to make nuclear weapons are widespread. A continuum of virtual capabilities exists, ranging from general technology diffusion and the existence of nuclear energy programmes to conscious decisions to develop or maintain militarily significant nuclear-weapons capabilities.²⁰

Nuclear latency remains one of the biggest proliferation challenges facing the international community today.
Why is it a problem? The complication of nuclear latency stems from the fact that the technology needed for a civilian nuclear power programme is very similar to that needed to produce fissile material for a bomb, and because some military hardware designed for non-nuclear weapons systems can be modified to deliver nuclear weapons (by aircraft and missiles for example). The problem is compounded by the central bargain of the 1968 NPT, whereby all states have a right to produce their own civilian nuclear energy (for more on the NPT see Chapter 7). As a result, countries can move fairly close to acquiring a nuclear ‘breakout’ capability without actually undermining the NPT or breaking international law – this is at the heart of the current controversy over Iran’s ostensive civilian nuclear programme and whether or not this is being used as a basis to develop nuclear weapons (see Chapter 6). Because an increasing number of states are opting for civilian nuclear power programmes as the world searches for new sources of energy, the theoretical challenge of nuclear latency is also increasing. According to the then Director of the Atomic Energy Agency Mohammed ElBaradei:

Some estimates indicate that 40 countries or more now have the know-how to produce nuclear weapons, which means that if they have the required fissile material – high enriched uranium or plutonium – we are relying primarily on the continued good intentions of these countries …\(^\text{21}\)

While ElBaradei’s statement should not necessarily be interpreted as meaning that all these states will or could easily build nuclear weapons, it does underline the importance of this challenge. Indeed, despite the recent Fukushima nuclear disaster and the decision taken by Germany in 2011 to phase out civilian nuclear power\(^\text{22}\) the global trend is likely to be towards more rather than less nuclear power generation in the future (on the implications of this see Chapter 10).

Who does it involve? In theory any country with an active civilian nuclear industry and a modern hi-tech military infrastructure could build a nuclear bomb, although this would not be a straightforward task for any nation that decided to do so. The best-placed states to do this have full control of the nuclear fuel cycle – that is, they can enrich the fuel for (uranium) and/or separate the by-products of nuclear fission (plutonium). States that have civilian nuclear power reactors but have to buy nuclear fuel from abroad are far less of a proliferation risk – although because plutonium is a by-product of uranium fission (see Chapter 1) these civilian power plants must be closely monitored by the relevant international authorities, such as the International Atomic Energy Agency (IAEA). However, technological capabilities are only one dynamic of proliferation, and must of course be matched with the political will and broader technological expertise required to build a bomb. Developing a nuclear warhead small enough to be placed on a missile and survive the pressures of flight and possibly atmospheric re-entry, for example, is a very difficult task, although by no means insurmountable for a modern state. In general, a
nation wishing to move from latency to full nuclear weapons capability would need to meet significant challenges – not least keeping its programme secret from the international community and the IAEA.

Below are a number of examples of states that we might consider as having various degrees of nuclear latency:

- **Japan** is usually held up as the model of a latent nuclear-weapon state because it has an advanced civilian nuclear industry, the ability to produce HEU or plutonium (in addition to the stockpiles it already has), and a modern military. Given the geopolitical tensions in Northeast Asia, the threat that Japan may decide to ‘go nuclear’ is ever-present, although most observers would suggest that there is little enthusiasm for such a move, and Japan remains a key member of the NPT. However, it could probably build a deliverable nuclear bomb if it chose to do so within a relatively short space of time.\(^{23}\) In the words of Maria Rost Rublee,

> Japan’s continued non-nuclear status seems rather puzzling. With high levels of economic, scientific, and technological development, and a sophisticated nuclear energy program … and bordered by nuclear-armed neighbors with which it has had armed conflicts, Japan also has the motive to acquire nuclear weapons.\(^ {24}\)

Should the geostrategic situation in Northeast Asia change, Japan may well consider the nuclear option.

- **South Korea** operates a number of civilian nuclear power plants and has expressed an interest in acquiring the technology necessary to control the nuclear fuel cycle.\(^ {25}\) Like Japan and Taiwan, South Korea sits in a potentially volatile region and future changes could drive the case for a bomb. South Korea previously had an indigenous nuclear weapons programme that was cancelled in the 1970s, and until 1991 hosted US tactical nuclear weapons on its territory.\(^ {26}\) In the words of Jonathan Pollack and Mitchell Reiss, ‘The Republic of Korea undoubtedly possesses the individual infrastructure and manufacturing base to underwrite an indigenous nuclear weapons programme’.\(^ {27}\)

- **Taiwan** is not a member of the NPT given its unique status in international society, and established an embryonic nuclear weapons programme in the 1970s. While it is not currently believed to have enrichment capabilities, Taiwan does (like Japan) have specific regional concerns that could lead to arguments for a nuclear weapons capability, but the costs of doing so are probably too high for the time being (US opposition, international condemnation, or even a Chinese pre-emptive strike). Nevertheless, Taiwan probably possesses the necessary infrastructure (although work would be needed to build a suitable missile and warhead) should this intention change in the future.\(^ {28}\) However, as Arthur Ding suggests, ‘Despite the fact that strategic
logic might dictate the acquisition of a modest nuclear arsenal. Taiwan is unlikely to develop nuclear weapons.\(^{29}\)

- **Brazil** possesses all the major elements needed to produce fissile material for a bomb but currently lacks the means to deliver nuclear weapons should it choose to build them – although it is suspected of having a nuclear bomb programme in the past (see Chapter 9). Brazil is also an active member of the NPT, and is therefore seen as an unlikely future nuclear-weapon state.\(^{30}\)

- **Iran** is a member of the NPT but many suspect that its nuclear programme could be designed for military purposes. It is seeking to achieve full control of the fuel cycle – which would mean an ability to produce HEU and PU239 – and has a large military, including a relatively advanced ballistic missile programme. Iran is perhaps the biggest concern for future proliferation due to its current geopolitical situation\(^{31}\) (for more on Iran see Chapter 6).

- **Saudi Arabia** Sitting at the heart of a region with ever-changing security requirements – not least the possibility of a nuclear-armed Iran on its doorstep, coupled with a perceived decline in US influence – and with an advanced infrastructure and burgeoning economy, Saudi Arabia represents a serious nuclear proliferation concern. As James Russell points out, ‘Saudi Arabia is an important proliferation candidate and is the most likely country to move the Middle East toward an altered nuclear posture’.\(^{32}\) Saudi Arabia does not currently operate any civilian nuclear facilities, but it is rumoured to have close nuclear ties with Pakistan and other states that do.\(^{33}\)

A number of other states theoretically have the capability to build a nuclear bomb should they choose to (see Appendix 3), but the likelihood of this happening is deemed slight – and some of the reasons for this are detailed below (for more on the weapons proliferation aspects of civilian nuclear power programmes see Chapter 10).

**Challenges involved in moving from latency** There are a number of challenges facing any state that decides to move from latency to a full nuclear weapons capability, and the most pressing of these are listed below:

- Perhaps the most difficult and most important is secrecy: the implications of discovery would be severe for any would be proliferator. If discovered, it is likely that international action would be taken to prevent weaponisation – likely through sanctions but also potentially by military force. States must bypass IAEA inspections, satellite imagery and other forms of foreign intelligence in their quest to build the bomb.

- Building a nuclear warhead small enough and reliable enough to use would be another considerable challenge, as would building the missiles or other forces needed to credibly deliver those warheads to their targets.

- Any aspirant nuclear power would probably want to test a device to ensure that it worked, and this would have significant implications – not least
undermining the NPT and other international agreements – but also for secrecy, explained above.

- Diplomatically, a move to build nuclear weapons would probably lead to pariah status within the international community and a wide range of crippling economic sanctions (as we have seen with North Korea and to a lesser extent Iran).
- Above all, a move away from latency would need strong political will and a highly advanced technological and scientific infrastructure.

Nuclear latency is the natural result of the close link between the production of civilian nuclear energy and the technology needed to build a nuclear bomb. While this doesn’t mean that every nation with nuclear power reactors, enrichment or reprocessing capabilities and associated technologies could easily build a bomb or will build a bomb, it does give varying degrees of potential (latency) to build one if such a decision was to be made. Nations of most concern are those with control of the nuclear fuel cycle (enrichment and separation capabilities), an advanced scientific and military technological base (particularly ballistic missile technology), and immediate or potential future geopolitical and security concerns. Iran, and to a lesser extent Japan, South Korea, Taiwan and perhaps Saudi Arabia, fit this bill closest at the moment, but it could include others in the future as geopolitics change. As Michael Mazarr explains, ‘for most developed and a few developing states the question is not whether they could have nuclear weapons but, rather, how long it would take to deploy them’.

(Continued)
During the first four decades of the nuclear age, total global nuclear stockpiles rose exponentially, but overall numbers have reduced considerably since the 1980s. Over the same time period there has been a slow spread of nuclear weapons to new actors. However, an increase in nuclear actors has not meant an increase in nuclear weapons.

It has become popular to divide the atomic age between a first nuclear age (1945–1991) and a second nuclear age (1991–). The main actors, challenges and dangers are perceived to have changed between these two periods.

The impact of nuclear proliferation is the subject of intense debate. Proliferation pessimists suggest that the spread of nuclear weapons makes accidents, unauthorised use, or even a deliberate nuclear exchange more likely, whereas proliferation optimists suggest that such fears are overstated, and that nuclear proliferation can lead to stability through nuclear deterrence. Pessimists suggest that this problem has become worse in the second nuclear age.

Nuclear latency refers to a situation whereby a state has the potential capability to produce nuclear weapons but has chosen not to do so. A latent nuclear state is likely to have most of the ingredients needed for a bomb, and could build one in a relatively short time if desired, although this varies from state to state. Japan, South Korea and Brazil are often cited as notable latent nuclear states, and Iran may be on the same path.

Further reading and resources

The best resource on why states decide to build nuclear weapons is Scott Sagan’s seminal article, ‘Why do states build nuclear weapons?’ (1996–7). You may also want to consult the special edition of the journal Security Studies (2:3–4) published in 1993. Jacques Hymans’ ‘The psychology of nuclear proliferation’ (2006) provides an interesting insight into why certain states have chosen not to develop nuclear weapons that might have done, as do Mitchell Reiss’s ‘Bridled ambition’ (1995); TV Paul’s ‘Power versus prudence: why nations forgo nuclear weapons’ (2000); and Maria Rost Rublee’s ‘Nonproliferation norms’ (2009). Kurt Campbell et al. (eds.) ‘The nuclear tipping point’ (2004) and James Wirtz and Peter Lavoy (eds.) ‘Over the horizon proliferation threats’ (2012) are also useful resources on this topic. While Thomas Reid and Danny Stillman’s ‘The nuclear express’ (2009) provides a solid historical overview of nuclear proliferation in general. More detailed information on why Israel, India, Pakistan and North
Korea ‘went nuclear’ can be found in Chapter 6. More details on why some states have given up the bomb can be found in Chapter 9.

On the idea of a second nuclear age and the rise of new nuclear proliferation challenges, you should see Paul Bracken ‘The second nuclear age’ (2013); Colin Gray ‘The second nuclear age’ (1999); Fred Ikle ‘The coming of the second nuclear age’ (1996); Toshi Yoshihara and James Holmes ‘Strategy in the second nuclear age’ (2012); and Keith Payne ‘Deterrence in the 2nd nuclear age’ (1996).


Scott Sagan’s chapter ‘Nuclear latency and nuclear proliferation’ (2010) is an excellent introduction to the concept of nuclear latency, as is Jacques Hymans ‘When does a state become a nuclear weapon state?’ (2010). Michael Mazarr ‘Nuclear weapons in a transformed world’ (1997) and ‘Virtual nuclear arsenals’ (1995) are both useful resources. Benjamin Frankel ‘Opaque nuclear proliferation’ (1991) and Avner Cohen and Joseph Pilat ‘Assessing virtual nuclear arsenals’ (1998) are also helpful, while Maria Rost Rublee ‘The nuclear threshold states’ (2010) provides an interesting analysis of the threshold status of Brazil and Japan. The Nuclear Threat Initiative website is a great up-to-date resource on particular countries’ nuclear and WMD programmes (www.nti.org/country-profiles/).

Notes

6. Ibid.
7. Ibid.
THE POLITICS OF NUCLEAR WEAPONS

16. Ibid.
26. See Mark Hibbs, ‘Will South Korea go nuclear?’, Foreign Policy, (15 March 2013), www.foreignpolicy.com/articles/2013/03/15/will_south_korea_go_nuclear.
NUCLEAR PROLIFERATION: WHY STATES BUILD OR DON’T BUILD THE BOMB