

Nuclear Politics

When do states acquire nuclear weapons? Overturning a decade of scholarship focusing on other factors, Debs and Monteiro show in *Nuclear Politics* that proliferation is driven by security concerns. Proliferation occurs only when a state has both the willingness and opportunity to build the bomb. A state has the willingness to nuclearize when it faces a serious security threat without the support of a reliable ally. It has the opportunity when its conventional forces or allied protection are sufficient to deter preventive attacks. This explains why so few countries have developed nuclear weapons. Unthreatened or protected states do not want them; weak and unprotected ones cannot get them. This powerful theory combined with extensive historical research on the nuclear trajectory of sixteen countries will make *Nuclear Politics* a standard reference in international security studies, informing scholarly and policy debates on nuclear proliferation – and U.S. nonproliferation efforts – for decades to come.

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Nuclear Politics

The Strategic Causes of Proliferation

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À mon père, Chaouki (1945–2016).

–AD

Para a minha mãe, Odete da Piedade.

–NPM

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Building an atomic bomb here would be stupid. We have no threats.

–Admiral Maximiano da Fonseca
Minister of the Navy of Brazil, 1979–1984

If we are satisfied with our security requirements in conventional armaments, ... we would not hazard our economic future and promote an economic and social upheaval by diverting vast resources for a nuclear program.

–Zulfikar Ali Bhutto
Prime Minister of Pakistan, 1974

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Cover illustration: atomic explosion photographed by Harold Edgerton of EG&G, on commission for the Atomic Energy Commission, likely at the Nevada Proving Grounds circa 1952. Taken using a Teletronic camera shooting at ultra-high speed (1/100,000,000-of-a-second exposure) with a 10-foot long lens from seven miles away, this photograph reveals the anatomy of the first microseconds of an atomic explosion. © 2010 MIT. Courtesy of MIT Museum.

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Preface

This book is the product of a wonderful intellectual journey that started when we both arrived at Yale as assistant professors in 2009. Coming from backgrounds that could hardly be more different – Alexandre had been trained as an economist at MIT; Nuno, as an IR theorist at Chicago – we quickly found overlapping interests. Substantively, we were both keen to understand the dynamics of the nuclear age – the long shadow cast by nuclear weapons on world politics since 1945. Conceptually, we both wanted to refine existing theories of international politics by placing states' security interests in their strategic context and analyzing their interaction. Methodologically, we both sought to further the use of historical research to test theoretical propositions, especially causal mechanisms. Professionally, we both aimed to encourage further dialogue between formal and informal approaches to theorizing world politics, as well as between theory and history. More than a half dozen years later, we are both happy to realize that our objectives have remained largely the same. (And we take that as evidence that we are on to something important, rather than as proof that we have so far failed to achieve our goals!)

What started as a series of brief discussions over lunch quickly turned to informal chats in front of a white board, then to research memos bouncing back and forth, until by early 2010 we thought it was time to work on something together. Neither of us was happy with the literature on power transitions. So we set out to write a paper on the question of when power shifts lead to preventive wars.¹ After workshopping it around, we realized that we had focused on only half of the broader problematique that interested us. While focusing on preventive wars, our theoretical framework also offered predictions on when power shifts actually happen, despite these preventive dynamics. We therefore decided that after wrapping up our original paper, we

¹ This ultimately became Debs and Monteiro (2014).

should write another, looking at this second question in greater depth. At the same time, it gradually became clear to us that the magnitude of the power shift introduced by a state acquiring nuclear weapons – in the jargon, horizontal proliferation – is qualitatively different from most (perhaps all) other shifts in military power. This, in turn, made us realize that our real interest was in the causes of nuclear proliferation, a topic on which neither of us had done any serious thinking.

By 2011, then, our work together was expanding to cover the question that animates this book: under which conditions do states acquire nuclear weapons? We started modestly – or was it hubristically? – thinking that one more paper would allow us to “say our piece” and move on.² Alas, as often happens, the more we dug, the more we realized we had more to learn and more to convey. To begin with, the literature on the topic was, well, sizeable. There was a multitude of theoretical arguments to grapple with. This was less of a problem, as we had clear views on what we wanted to do: to place the security interests of all states affected by one state’s possible nuclear acquisition within a strategic interaction context and analyze the conditions under which proliferation was more likely to occur. The bigger problem was the gradual realization that the field of nuclear studies occupies this middle ground between the study of rare events (such as, for instance, hegemonic wars), of which the number of cases is small enough that there is little doubt the researcher can (and is expected to) master all of them, and the study of frequent events (such as, for instance, interstate crises), of which the number is large enough that no researcher could (or would be expected to) master the historical details of them all. In between these two positions, the field of nuclear studies covers enough historical ground that a researcher can spend a lifetime struggling to master its historical domain; while not including a sufficiently large number of cases that mastery of the historical record is unthinkable – or, some might say, unnecessary – and instead most research consists of uncovering regularities in large-*n* data using statistical tools. In short, nuclear studies, when properly done, require the researcher to master the history of the nuclear age. Perhaps this explains why most experts on the topic devote their entire careers to it. It certainly explains why this book was four years in the making.

² This paper became Monteiro and Debs (2014).

This issue manifested itself in practice as a scholarly version of the infamous “Nth country” problem in nuclear politics. Just like policy-makers have long worried about “the possibility that more and more countries might acquire nuclear weapons,” we found ourselves worrying about the possibility that more and more countries might acquire a place in our book.³ Whenever we presented our already burgeoning drafts or sent them out to someone who had kindly volunteered to read them, we almost invariably received a comment of the form: “What about country N, on which you have no case study? How does N fit into your theory?” So we started trying to preempt these criticisms by attempting to guess which would be the Nth country that people would ask about next. If we wanted to bring together theory and rich empirical accounts, we needed to wrestle with a seemingly unending number of cases of (attempted as well as actual) nuclear proliferation. In the end, this dynamic accounts for the considerable length of the book.

Looking back, and much as we may have despaired along the way every time someone brought up another case and, with it, another large set of materials to master, this was the right thing to do. Our theory matured as a result of being exposed to this expanding set of cases. Our understanding of the nuclear age also changed appreciably. But it took us a while. In the end, this need to cover a relatively large universe of historical cases – the more than two dozen states that, at one point or another, had an active nuclear program with a military component – dictated the need to write a book. And so we started writing the pages that follow. Four years later, we are thrilled to finally abandon them. (As Paul Valéry said of poems, so with books: they are never finished, only abandoned.)

A book always involves fighting many battles, some larger, others smaller. (We hope to have won the one we fought against the particularly stubborn auto-correct function in our word processor, which insisted in giving France a *force de frappé*.) Nevertheless, we are happy to report that our overall experience was a joy for both of us. Perhaps this is owed to our own approach to coauthorship. Seen from the outside, one might be led to guess that one of us does “the math” and the other brings in the historical knowledge; or that “the math” drives the theory and the other does “the chatty bits;” or that one puts

³ Iklé (1960, 391). See also: Wohlstetter (1961).

“numbers” on the other’s arguments or ideas; or that each of us covers half the ground; or whatever. Instead, we decided to do it in what is perhaps an inefficient method: each of us read and summarized existing work; dug up archival materials; helped manage our platoon of intrepid research assistants; then together we debated and refined our theory, while discussing its fit with the cases; finally we each drafted different sections of the manuscript, then swapped our rough drafts back and forth and edited each other’s writing, until – we hope – the whole thing has a coherent style, such as it is. This process was not the result of a particularly conscious decision. Rather, it emerged organically from our shared interests in writing the book: each of us was determined to learn more about the politics of the nuclear age – and about the workings of the dialogue between formal theory, natural-language theory, and history. In our view, this approach to coauthorship may take longer to get things done, but it also, at least in our case, makes for a better final product. And it was certainly more fun.

We hope this will be the first of many books we write together – and we already have ideas for at least a couple more, on nuclear matters and beyond. The obvious sequel would be another book covering nuclear politics after proliferation. How do states react to another state’s acquisition of nuclear weapons? How do nuclear weapons – and the omnipresent danger of escalation – shape state behavior in and beyond crises? We have started exploring these matters in a working paper and feel that we will soon have enough to present on this to make for a second volume on nuclear politics.⁴ So, stay tuned.

This book would not have seen the light of day without the support of many – indeed, so many that the first order of business here is to apologize in advance to any whose names we may have unwittingly omitted in these pages.

For having graciously agreed to read different sections of the manuscript, and for sending us helpful comments and suggestions, we thank Dimitris Bourantonis, Jonathan Caverley, Andrew Coe, Martha Crenshaw, James Fearon, John Lewis Gaddis, Richard Gillespie, Eliza Gheorghe, Feliciano Sá Guimarães, Jolyon Howorth, Robert Jervis, Thomas Jonter, David Kang, Jonathan Kirshner, Jiyoung Ko, Matthew Kocher, Andrew Kydd, Adria Lawrence, Christine Leah, Philip Lutgendorf, Sean Lynn-Jones, John Mearsheimer, Costanza

⁴ See: Anderson, Debs, and Monteiro (2015).

Musu, Vipin Narang, Behlul Ozkan, David Palkki, Carlo Patti, Benoit Pelopidas, Barry Posen, Robert Powell, Or Rabinowitz, Samuel Rajiv, Frances Rosenbluth, Andrew Ross, Joshua Rovner, Bruce Russett, Scott Sagan, Nicholas Sambanis, Jayita Sarkar, Anne Sartori, Kenneth Schultz, Duncan Snidal, Matias Spektor, Aaron Stein, Oliver Stuenkel, Milan Svolik, Michael Tomz, Panagiotis Tsakonas, Jessica Varnum, Hikaru Yamagishi, and Anne-Mart Van Wyk.

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The pages that follow were made much better by feedback we received over two days in New Haven back in May 2014, during which an earlier draft was subjected to unrelenting (though gentlemanly delivered) criticism by Frank Gavin, Charlie Glaser, Colin Kahl, Robert Powell, Daryl Press, Scott Sagan, and our editor, Robert Dreesen. We are tremendously grateful to all of them – as well as to David Holloway, Leopoldo Nuti, and Marc Trachtenberg, who could not be present but sent us detailed comments on the whole manuscript. This workshop would not have been possible without significant financial support from the Leitner Program in International

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An earlier, compressed version of the arguments laid out in Chapter 2, as well as shorter versions of our case studies on the Soviet Union, Iraq, Pakistan, South Korea, and West Germany, and some of our conclusions in Chapter 7 appeared in Nuno P. Monteiro and Alexandre Debs, “The Strategic Logic of Nuclear Proliferation,” *International Security*,

Vol. 39, No. 2 (2014), pp. 7–51. Furthermore, an earlier version of the model discussed in Chapter 2 and the appendix, as well as a shorter version of our case study of Iraq, appeared in Alexandre Debs and Nuno P. Monteiro, “Known Unknowns: Power Shifts, Uncertainty, and War,” *International Organization*, Vol. 68, No. 1 (2014), pp. 1–31. We gratefully acknowledge permission from MIT Press Journals and the IO Foundation to elaborate on those ideas here.

Personally, Alexandre would like to thank Daron Acemoglu, his PhD thesis supervisor, for generous feedback throughout his graduate studies, and for helping him discover his passion for political questions. Alexandre would also like to thank his wife Mira, and children Francesca and Gabriel, for filling his life with love and laughter. He observes that when reviewing the major events of the day at the dinner table and dividing them up into happy, hopeful, and challenging moments – the “rose,” the “bud,” and the “thorn” – he always has an abundance of choices for the “rose” from his time spent with them. Finally, Alexandre would like to thank his mother Diane and sister Marie-Estelle for their unconditional love and support.

Alexandre dedicates this book to his father, Chaouki (1945–2016), who is most responsible for Alexandre’s love of history and ideas. While he did not have a chance to see the book in its final form, he was very much present at its creation.

While finishing this book, Nuno became even more deeply indebted to John Mearsheimer, mentor and friend, who generously provided unfaltering support through trying times. Nuno hopes he will one day be able to pay this forward; he is sure he will not be able to pay it back. Nuno also wishes to thank his wife, Audrey Latura, for always finding a way to prevent the lid on the pressure cooker from sealing him inside. He can only hope to reciprocate when her turn to write a book arrives, he trusts soon. Finally, Nuno wants to express his gratitude to his son, Sebastian Miguel, who, having arrived as we were putting the finishing touches on this manuscript, was far more cooperative than his early age warranted us to expect.

Nuno dedicates this book to his mother, Odete da Piedade, who taught him the central role that dreams play in life, and provided him with unflinching support in pursuing his own.

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Abbreviations and Acronyms

| | |
|---------|---|
| ABACC | Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials |
| ACDA | Arms Control and Disarmament Agency, of the United States |
| ADD | Agency for Defense Development, of South Korea |
| AEA | Atomic Energy Authority, of Egypt |
| AEB | Atomic Energy Board, of South Africa |
| AEC | Atomic Energy Commission, of both the United States and South Africa |
| AEOI | Atomic Energy Organization of Iran |
| AERC | Atomic Energy Research Committee, of India |
| ANC | African National Congress, of South Africa |
| ATOP | Alliance Treaty Obligations and Provisions data set |
| BJP | Bharatiya Janata Party, of India |
| CANDU | Canadian Deuterium nuclear reactor |
| CASP | Country Analysis and Strategy Paper, of the U.S. Department of State |
| CCP | Chinese Communist Party |
| CDA | Common Development Agency, between the United States and the United Kingdom |
| CDU/CSU | Christian Democratic Union of Germany/ Christian Social Union of Bavaria |
| CEA | Atomic Energy Commission (<i>Commissariat à l'Énergie Atomique</i>), of France |
| CENTO | Central Treaty Organization |
| CIA | Central Intelligence Agency, of the United States |
| CINC | Composite Index of National Capabilities data |
| CIRUS | Canadian-Indian Reactor, United States, of India |
| CNEA | National Atomic Energy Commission (<i>Comisión Nacional de Energía Atómica</i>), of Argentina |

| | |
|---------|---|
| CNEN | National Commission for Nuclear Energy (<i>Comissão Nacional de Energia Nuclear</i>), of Brazil |
| CNPq | National Council of Scientific and Technological Development (<i>Conselho Nacional de Desenvolvimento Científico e Tecnológico</i>), of Brazil |
| COW | Correlates of War data set |
| CSEM | National Center for Military Experiments (<i>Centre Saharien d'Expérimentations Militaires</i>), of France |
| CSN | National Security Council, of Brazil |
| CSSI | Chung-Shan Science Institute, of Taiwan |
| CTBT | Comprehensive Nuclear-Test-Ban Treaty |
| DMZ | Demilitarized Zone, separating North and South Korea |
| DOM-TOM | Overseas Departments and Territories (<i>départements et territoires d'outre-mer</i>), of France |
| DPRK | Democratic People's Republic of Korea, commonly known as North Korea |
| DTD | Directorate of Technical Development, of Pakistan |
| EDC | European Defence Community |
| EEAE | Greek Atomic Energy Commission |
| EMIS | Electromagnetic Isotope uranium enrichment |
| EURATOM | European Atomic Energy Community |
| F-I-G | France-Italy-Germany treaty |
| FNLA | National Liberation Front of Angola (<i>Frente Nacional de Libertação de Angola</i>) |
| FOA | National Defense Research Agency (<i>Försvarets forskningsanstalt</i>), of Sweden |
| Frelimo | Front for the Liberation of Mozambique (<i>Frente de Libertação de Moçambique</i>) |
| FRG | Federal Republic of Germany, commonly known as West Germany |
| FRUS | Foreign Relations of the United States series |
| GDP | Gross Domestic Product |
| GOP | Government of Pakistan |
| GRC | Government of the Republic of China (alt. GROC) |
| HEU | Highly-Enriched Uranium |
| IAEA | International Atomic Energy Agency |
| IAEC | Indian/Iraqi/Israeli Atomic Energy Commissions |

Abbreviations and Acronyms

xxv

| | |
|--------|--|
| ICB | International Crisis Behavior data set |
| ICBM | Intercontinental Ballistic Missile |
| IMF | International Monetary Fund |
| INER | Institute of Nuclear Energy Research, of Taiwan |
| INR | Bureau of Intelligence and Research, of the U.S. Department of State |
| INUS | Insufficient but Necessary part of a condition that is itself Unnecessary but Sufficient to produce an outcome |
| IRBM | Intermediate-Range Ballistic Missile |
| ISIL | Islamic State of Iraq and the Levant |
| JAEC | Japan Atomic Energy Commission |
| JCPOA | Joint Comprehensive Plan of Action, on Iran's nuclear program |
| JCS | Joint Chiefs of Staff, of the United States |
| JDA | Japan Defense Agency |
| JPOA | Joint Plan of Action, on Iran's nuclear program |
| KAERI | Korea Atomic Energy Research Institute, of South Korea |
| KANUPP | Karachi Nuclear Power Plant |
| KEDO | Korean Peninsula Energy Development Organization |
| LDP | Liberal Democratic Party, of Japan |
| LEU | Low-Enriched Uranium |
| LWR | Light-Water Reactor |
| MAD | Mutually Assured Destruction |
| MLF | Multilateral Force, of NATO |
| MPE | Markov Perfect Equilibrium |
| MPLA | People's Movement for the Liberation of Angola (<i>Movimento Popular de Libertação de Angola</i>) |
| MW | Megawatt |
| MWe | Megawatt Electric |
| NAM | Non-Aligned Movement |
| NATO | North Atlantic Treaty Organization |
| NDPO | National Defense Program Outline, of Japan |
| NIE | National Intelligence Estimate, of the United States |
| NMC | National Military Capabilities data set |
| NNPA | Nuclear Nonproliferation Act, of the United States |
| NPG | Nuclear Planning Group, of NATO |

| | |
|----------|--|
| NPT | Treaty on the Non-Proliferation of Nuclear Weapons, commonly known as the Non-Proliferation Treaty |
| NSC | National Security Council, of the United States |
| NSC-# | National Security Council report #, of the United States |
| NSG | Nuclear Suppliers Groups |
| OB-# | Supreme Commander's (<i>Överbefälhavaren</i>) recommendation #, of Sweden |
| OPEC | Organization of Petroleum Exporting Countries |
| P5+1 | The Five Permanent Members of the UN Security Council, plus Germany |
| PAEC | Pakistani Atomic Energy Committee |
| PARR-1 | Pakistani Atomic Research Reactor |
| PATN | Autonomous Program of Nuclear Technology, of Brazil |
| PBE | Perfect Bayesian Equilibrium |
| PINSTECH | Pakistani Institute of Nuclear Science and Technology |
| PKK | Kurdistan Worker's Party |
| PLO | Palestine Liberation Organization |
| PNE | Peaceful Nuclear Explosion |
| PPE | Perfect Public Equilibrium |
| PRC | People's Republic of China, commonly known as China |
| PTBT | Partial Nuclear Test Ban Treaty |
| RAFAEL | Authority for the Development of Armaments, of Israel |
| ROC | Republic of China, commonly known as Taiwan |
| ROK | Republic of Korea, commonly known as South Korea |
| ROKG | Republic of Korea Government |
| SADF | South African Defense Force |
| SAFARI | South African Fundamental Atomic Research Installation |
| SAP | Swedish Social Democratic Party (<i>Sveriges Socialdemokratiska Arbetareparti</i>) |
| SEATO | South East Asian Treaty Organization |
| SETAF | Southern European Task Force, of the United States |

Abbreviations and Acronyms

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| SNEPP | Study of Nuclear Explosions with Peaceful Purposes, of India |
| SNIE | Special National Intelligence Estimate, of the United States |
| SWAPO | South-West African People's Organization, of Namibia |
| TAEK | Turkish Atomic Energy Authority |
| TRR | Taiwan Research Reactor |
| UF6 | Uranium Hexafluoride |
| UN | United Nations |
| UNGA | United Nations General Assembly |
| UNITA | National Union for the Total Independence of Angola (<i>União Nacional para a Independência Total de Angola</i>) |
| UNMOVIC | United Nations Monitoring, Verification, and Inspection Commission |
| UNSC | United Nations Security Council |
| UNSCOM | United Nations Special Commission |
| USG | United States Government |
| USSR | Union of Soviet Socialist Republics, commonly known as the Soviet Union |
| WMD | Weapons of Mass Destruction |