Selected Essays on the Transition to a New Nuclear Order

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From Nuclear Weapons to the Currency of Power

Anne I. Harrington

The idea that nuclear weapons function as a global currency of power has been circulating among nuclear experts since at least the 1970s. It is a concept that resonates strongly with the experience of diplomats working in the fields of arms control and nuclear nonproliferation, particularly those who represent the interests of states without nuclear weapons.[1] Despite widespread colloquial use of the analogy between nuclear weapons and economic currency, there has been relatively little work done to develop the analogy beyond surface-level similarities and connotations of prestige. This failure to take the analogy seriously and develop its implications could be because there appears to be an obvious limit to its applicability: Unlike coins, nuclear weapons explode. In other words, the fact that nuclear weapons are a categorically different object than economic currencies such as salt, gold, or fiat money, appears to limit the deeper structural homologies between the logic of deterrence and the logic of economic exchange. What does it mean to claim that nuclear weapons are best understood not first and foremost as a weapon of war, but as a global power currency?

In this paper I develop the analogy between economic theory and nuclear weapons as a currency of international power. I argue that although nuclear weapons may not yet function as a full-fledged currency of power, they are much like what one could think of as a global power commodity. Despite obvious differences, the structural homologies between the logic of deterrence and the logic of economic exchange run much deeper than what might previously have been supposed. Developing these structural similarities is the heart of the argument.

In the opening and closing sections I contest the two most common objections to the applicability of this particular economic analogy to the nuclear realm. First, the objection that nuclear weapons explode, while money does not, underestimates the role of physical violence in

[1] States party to the Nuclear Nonproliferation Treaty (NPT) sign as 'nuclear weapon states' or 'non-nuclear weapon states.' According to the terms of the treaty the status of 'nuclear weapon state' is reserved for those countries that tested a nuclear explosive device prior to January 1, 1967, making it an exclusive club. There are five recognized nuclear weapon states: the United States, Russia, the United Kingdom, France, and China.

establishing and maintaining the value of money. There are many theories of money, and where one comes down on the role of violence in establishing and maintaining the value of our economic currency depends on which theory one follows. Second, the tendency to underestimate the role of physical violence in economic exchange often leads people to assume that claiming nuclear weapons are a type of power commodity has little to do with hard security concerns. Rather than an argument about how and why deterrence works, there is a tendency to reduce arguments about nuclear weapons as a global power currency to the idea that nuclear weapons fulfill a desire for prestige. I argue that it is a mistake to conflate the role nuclear weapons (and nuclear materials more broadly) play as a global power currency with arguments about prestige because it sets up a false dichotomy between the pursuit of a state's 'real' security interests and its desire for social standing. Rather, the transformation of nuclear weapons from a military instrument into a global currency of power is an extension of the security logic expressed by deterrence theory.

In addition to its contribution to developing a theory of nuclear weapons as a global power currency, this paper also makes a contribution to policy-relevant debates about nuclear nonproliferation negotiations. The idea that arms control and nonproliferation agreements are little more than window dressing and have no "independent effect" on state behavior (or at best explain variation at the margin) is a common refrain in realist thought. Until recently, this has meant that, relative to the importance these agreements are accorded at US think tanks and in policy circles, there was little academic scholarship being done on the nonproliferation regime itself. The dynamic has slowly begun to shift as younger political scientists have shown an increasing interest in testing hypotheses against data sets derived from the Cold War.[2] However,

[2] See for instance, Matthew Fuhrmann, "Spreading Temptation: Proliferation and Peaceful Nuclear Cooperation Agreements," *International Security* 34 (2009): 7–41; Matthew Fuhrmann, "Taking a Walk on the Supply Side: The Determinants of Civilian Nuclear Cooperation," *Journal of Conflict Resolution* 53 (2009): 181–208; Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity* (Ithaca, NY: Cornell University Press, 2012); Matthew Fuhrmann and Sarah E. Kreps, "Targeting Nuclear Programs in War and Peace: A Quantitative Empirical Analysis, 1941–2000," *Journal of Conflict Resolution* 54 (2010): 831–59; Dong-Joon Jo and Erik Gartzke, "Determinants of Nuclear Weapons Proliferation: A Quantitative Model," *Journal of Conflict Resolution* 51 (2007): 167–94; Matthew Kroenig, "Exporting the Bomb: Why States Provide Sensitive Nuclear Assistance," *American Political Science Review* 103 (2009): 113–33; Matthew Kroenig, *Exporting the Bomb: Technology Transfer and the Spread of Nuclear Weapons* (Ithaca, NY: Cornell University Press, 2010). Matthew Kroenig, "Force or Friendship? Explaining Great Power Nonproliferation Policy," *Security Studies* 23 (2014): 1–32; Nuno P. Monteiro and Alexandre Debs, "The Strategic Logic of Nuclear Proliferation" *International Security* 39 (2014): 7–51; Alexander H. Montgomery, "Ringing in Proliferation: How to Dismantle an Atomic Bomb Network,"

the nonproliferation regime's independent effect, in so far as they find one, is limited to coordinating the independent interests of non-nuclear weapon states in halting the spread of nuclear weapons, thereby decreasing the burden of enforcing the superpower consensus against rogues and outliers.[3]

In contrast, a theory of nuclear weapons as a currency of power renders visible the practices that are essential to understanding the role of nuclear technology in mediating this diplomatic realm of strategic interaction. Rather than discounting arms control negotiations as façades that hide a state's real intentions, an interpretation of nuclear weapons as a 'power commodity' places arms control and nonproliferation negotiations at the center of the analysis as sites of exchange. Nuclear nonproliferation agreements, like the one just concluded between the P5+1 and Iran, are the primary vehicle for negotiating the terms of exchange.

The first section of this paper reviews the recent literature on causes of proliferation and makes the case that it is a mistake to reduce a theory of nuclear weapons as a currency of power to the pursuit of status or prestige. The second section establishes a link between a theory of nuclear weapons as a currency of power and nuclear deterrence theory by drawing out the parallel between Schelling's distinction between 'brute force' and the 'power to hurt,' and the distinction in economic theory between products and commodities. In doing so it also introduces the main elements of a theory of nuclear weapons as a currency of power. The third section confronts the most common objection to a theory of nuclear weapons as a currency of power, namely that nuclear weapons "still explode." In conclusion, I suggest avenues for future research that would further develop the policy-relevant aspects of this research agenda.

International Security 30 (2005): 153–87; Maria Rost Rublee, *Nonproliferation Norms: Why States Choose Nuclear Restraint* (Athens: University of Georgia Press, 2009). Dane Swango, "The Nuclear Nonproliferation Treaty: Constrainer, Screener, or Enabler" (PhD diss., University of California, Los Angeles, 2009); Dane Swango, "The United States and the Role of Nuclear Cooperation and Assistance in the Design of the Non-proliferation Treaty," *International History Review* 26 (2014): 210–29. For a recent review of this literature, see Scott D. Sagan, "The Causes of Nuclear Weapons Proliferation," *Annual Reviews of Political Science* 14 (2011): 225–44.

[3] Andrew Coe and Jane Vaynman, "Collusion and the Nuclear Nonproliferation Regime," *Journal of Politics*, 77, 4 (2015). Published online August 6, 2015. http://dx.doi.org/10.1086/682080.

Nuclear Proliferation and the Mistaken Demand for Prestige

Despite its resonance with policymakers, the idea that nuclear weapons are a global power currency has played a minor role in the US debate about nuclear proliferation. US-based research on why states choose to build nuclear weapons is commonly understood to have two strands: 'demand-side' and 'supply-side' explanations. The primary puzzle that motivates this debate is that the nuclear dominos never fell as Albert Wohlstetter and others predicted they would.[4] There is a significant gap between the number of nuclear capable states and those that have weaponized their nuclear programs.

The touchstone for the demand side literature is Sagan's 1996 article "Three Models in Search of a Bomb." In it, Sagan divides the existing literature into three main paradigms.[5] His three-part structure maps loosely onto the demand-side debate even 20 years later. There are realists, who focus on the anarchic structure of the international system as driving a state to seek security;[6] domestic institutionalists, who focus on the bureaucratic sources of foreign policy;[7] and a third category that includes 'constructivist' arguments broadly construed to include norms, identity, and prestige.[8] Sagan concludes that, although the realist model may best explain the most cases, the evidence supports a multi-causal approach. States do build the bomb when their security is threatened as a realist would contend, but there are also cases in which state behavior is better explained by bureaucratic bargaining processes or as a desire for international prestige.

Despite the fact that Sagan continues to argue that no one theory effectively dominates the field,[9] there is a general bias towards security-based realist explanations. This bias supports a default assumption among realists that there is little to no linkage between the NPT and proliferation. It

[4] Albert Wohlstetter, "Nuclear Sharing: NATO and the N+1 Problem," *Foreign Affairs* (April 1961).
[5] Scott D. Sagan, "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb," *International Security* 21(Winter 1996/97), pp. 54-86; See also Tanya Ogilvie-White, "Is There a Theory of Nuclear Proliferation? An Analysis of the Contemporary Debate," *Nonproliferation Review* 2 (Fall 1996): 43–60.
[6] Nuno P. Monteiro and Alexandre Debs, "The Strategic Logic of Nuclear Proliferation," *International Security* 39, 2 (2014): 7–50.
[7] Etel Solingen, *Nuclear Logics* (Princeton: Princeton University Press, 2007).
[8] Maria Rost Rublee, *Nonproliferation Norms: Why States Choose Nuclear Restraint* (Atlanta: University of Georgia Press, 1995); Barry O'Neill, "Nuclear Weapons and National Prestige," Cowles Foundation Discussion Paper No. 1560, February 2006.
[9] Scott D. Sagan, "The Causes of Nuclear Weapons Proliferation," *Annual Review of Political Science* 14 (2011): 225–44.

is not that they consider the NPT to be a cause of proliferation, but simply that they consider proliferation agreements largely irrelevant to the problem of proliferation.

In contrast, the supply-side literature, with its focus on the diffusion and availability of technology as a determinant of nuclear proliferation, finds fault with the NPT, which gives non-nuclear weapon states assistance with nuclear energy programs in exchange for abstaining from building a bomb. Not only do supply-side researchers find that the NPT's effect on a state's decision about whether or not to weaponize its nuclear program is marginal, but that the NPT spurs nuclear proliferation because it aids in the diffusion of nuclear technology.[10] As Erik Gartzke and Dong Joon Jo put it in their 2007 article, "Determinants of Nuclear Weapons Proliferation": "The NPT system variable probably has a slight normative constraint on proliferation, as the negative coefficient in the weapons stage implies. However, the inhibiting effect of the NPT is overcome by the stronger technological diffusion effect. Enthusiasm for the NPT among proliferation opponents thus appears to be misplaced."[11] Matthew Fuhrmann, in particular, seeks to flip the standard narrative on its head by stating unequivocally that, "the conventional wisdom [about nuclear cooperation] is wrong—and dangerous."[12] To summarize, he argues that civilian nuclear assistance increases the probability of weapons proliferation, especially if a country that already has an active civilian program becomes involved in a militarized dispute.[13] Instead of attributing the gap between (a) the number of nuclear capable states and (b) those that have weaponized their nuclear programs to the existence of the NPT, according to this school of thought the gap is due to the US "nuclear umbrella." In other words, the primary reason that states do not proliferate is that the United States extends its nuclear deterrent to allies through security guarantees.[14]

These supply-side findings are not uncontroversial—tellingly, Fuhrmann's data indicate that more than 99% of the time, civilian nuclear cooperation does not lead to a weapons program,

[10] Jo and Gartzke 2007; Fuhrmann 2009; Fuhrmann 2012; Kroenig 2010.
[11] Jo and Gartzke 2007, 185.
[12] Fuhrmann 2009, 8.
[13] Fuhrmann 2009, 30.
[14] John J. Mearsheimer, "Back to the Future: Instability in Europe After the Cold War," *International Security*, 15, 1 (Summer 1990); "Pushing and Pulling: The Western System, Nuclear Weapons, and the End of the Cold War," (with G. John Ikenberry) *International Politics* (July/September 2011): 496–554.

much less a bomb, a statistic that highlights just how vanishingly small his findings are. They also fly in the face of received political wisdom. Campbell Craig and Jan Ruzicka refer to the network of "governmental agencies, international nongovernmental organizations, think tanks, and academic programs and institutes" that support and promote the twin goals of nonproliferation and disarmament as the "Nonproliferation Complex."[15] The nonproliferation complex takes as its point of departure a belief that the NPT—if it is properly implemented and maintained—is an effective policy tool. Analysts argue that the health of the NPT requires adherence to its grand bargain: it requires nuclear weapon states to uphold their Article VI commitment to the pursuit of disarmament.[16] Jeffrey Knopf refers to this belief as the "linkage hypothesis,"[17] the merits of which became a regular feature of the mainstream US foreign policy debate after the Obama administration made the link between the US commitment to disarmament under the NPT and the adherence of non-nuclear weapon states to nonproliferation a central feature of its 2009 Nuclear Posture Review.

Within this discursive landscape, the idea that nuclear weapons function of as a currency of power is typically interpreted as being a demand-side argument about prestige. K. Subrahmanyam, an Indian strategic affairs analyst and champion of India's nuclear deterrent, developed the most extended treatment of the analogy between nuclear weapons and economic currency, and explained the connection to prestige. The interpretation of nuclear weapons as a 'global power currency' has long been influential in India, one of the few states that has continuously flouted nuclear norms by refusing to sign the NPT. Instead India developed its own nuclear deterrent and in 2009 signed a bilateral nuclear cooperation agreement with the United States, an agreement that provides India with many of the same benefits as being a signatory to the NPT. For Subrahmanyam, nuclear weapons functioned as a 'coin' of the international realm: "The debate in the U.S. strategic community on the number of warheads, throw-weights, etc. gives an impression that nuclear weaponry today is used in international politics somewhat in the

[15] Campbell Craig and Jan Ruzicka, "The Nonproliferation Complex" *Ethics & International Affairs*, 27, 3 (Fall 2013).
[16] George Perkovitch and James Acton, *Abolishing Nuclear Weapons: A Debate*, Washington, DC: Carnegie Endowment for International Peace, 2008; Harald Müller, "The 2010 NPT Review Conference: Some Breathing Space Gained, But No Breakthrough," *The International Spectator: Italian Journal of International Affairs* 45, 3 (2010).
[17] Jeffrey Knopf, "Nuclear Disarmament and Nonproliferation: Examining the Linkage Argument," *International Security* 37, 3 (Winter 2012/13): 92–132.

way gold stocks have been used in international economics. Gold by itself was of limited use; its value largely depended upon its acceptance by the international trading community. Similarly today, the major nuclear weapon powers are attempting to use their nuclear weapon stockpiles as an international currency of power." From this premise, Subrahmanyam went on to defend the nuclear ambitions of non-nuclear weapon states: "If this is so, then it is only logical to expect other nations which have a nuclear option to use it as a symbol of power and prestige."[18] Subrahmanyam argued that nuclear weapons were not primarily military instruments. It was the entrance that they bought to exclusive diplomatic realms that, in his view, was the primary reason that India should develop its own nuclear deterrent.[19]

If Subrahmanyan's interpretation of nuclear weapons as means to securing symbolic power and prestige is correct, then theorizing prestige is the key to developing a theory of nuclear weapons as a currency of power. Prestige is often offered as the 'third' explanation. It is the one into which cases that do not have straightforward security logics or bureaucratic institutional stories fall.[20] Given the prominence of prestige as an explanation for nuclear proliferation, there is a relative paucity of published work on the concept. Barry O'Neill's 2006 discussion paper is the most thorough application of prestige to questions of nuclear weapons.[21]

Prestige is what O'Neill calls a "second-level belief" where "[if] the 'zero-th level' of belief is the objective situation and the first level is beliefs about that situation…then prestige is at the second level." Prestige is not simply a belief shared in a dyadic sense between two individuals, rather it is the function of a belief that is believed to be commonly held within a group. There is a perception, correct or not, that a general consensus exists. O'Neill again: "A party has prestige with a group for a certain quality if (a) the members generally believe that they generally believe that the party has the quality; (b) they generally believe that they see the quality as desirable, and (c) they generally believe on account of the considerations in (a) and (b) that the party holds

[18] Amtav Ghosh, "Countdown: Why Can't Every Country Have the Bomb," *The New Yorker*, October 26, 1998. Accessed June 17, 2016 at http://archives.newyorker.com/?i=1998-10-26#folio=CV1.
[19] Ghosh 1998.
[20] Peter Lavoy, "Learning to Live with the Bomb? India and Nuclear Weapons, 1947–1974" (Ph.D. diss., University of California, Berkeley, 1997), cited in O'Neill 2006.
[21] O'Neill 2006.

power with the group."[22] Prestige, while it attaches to an individual, is a phenomenon that belongs to a group in the sense that it is an effect that emerges from a multiplicity of interactions, with or without the presence of the individual in question (who may or may not be a member of the group). The experience of prestige, therefore, confronts individuals as an external fact of life, one that can be controlled and manipulated only indirectly. Based on this definition, O'Neill then goes on to model different mechanisms for influencing prestige through the revelation of information about capabilities.

While O'Neill does not develop the concept of prestige in relation to currency, he does in a passing comment say that it is "somewhat like money, which is largely social and reflexive in nature, and is a common metaphor for prestige."[23] Technically, it would have been more correct to say that prestige is like wealth, and those objects that support the group-level belief system by communicating and conferring prestige (e.g., nuclear weapons) are like money in this analogy; nonetheless, what he is correctly identifying is the structural similarity at work. There is a similar dynamic in the experience of individuals vis-à-vis the group, in that prestige (the having of it or not) confronts each individual as an objective social fact, just as the value of a dollar bill, while socially constructed, likewise confronts each individual as an objective and unalterable reality. The strength, or stickiness, of that social fact should then vary with the conditions of the group but, like economic inflation and deflation, can be controlled or influenced only indirectly (through the control of a central bank over exchange rates, for instance).

The strength of this prestige perspective lies in this similarity to the currency of power analogy. It moves beyond the simply dyadic constructions of deterrence theory, which reduce international politics to a two-player game rather than accounting for the existence of a structural level dynamic. Yet, despite the evident associations between 'prestige' and 'money,' I will argue in the following section that it is just as much of a mistake to conflate the theory of nuclear weapons as a global power currency with motives of prestige as it would be to conflate monetary theory with the pursuit of wealth. States that mistake manipulating the 'currency of power' for the simple pursuit of prestige will make errors in judgment with potentially disastrous

[22] O'Neill 2006.
[23] O'Neill 2006, 2.

consequences. O'Neill, rightly, distinguishes the prestige motive from a state's 'objective' interests, which leads O'Neill to the conclusion that prestige is a motive that can divert a state from doing what is in its military interest. As O'Neill argues: "States often forgo their direct interests for the sake of prestige, investing in projects that display their modernity, engaging in conflicts over symbols of prestige, or building grand but impractical weapons."[24] However, as I will explain, a theory of nuclear weapons as a global currency of power renders visible the processes through which states 'trade' on nuclear technology in order to achieve their foreign policy and military goals.

What this mistaken prestige perspective overlooks is the extent to which deterrence theory is already a theory of nuclear weapons as a currency of power. The conflation of the currency argument with prestige is due, at least in part, to the perception that deterrence theory deals with the materiality of nuclear weapons and their violence, and saying that nuclear weapons are a global power currency is an argument about their diplomatic function. However, as Thomas Schelling explains, deterrence is also a diplomatic practice. It is the "diplomacy of violence."[25] This diplomatic practice is predicated on a distinction between what he calls 'brute force' and the 'power to hurt,' a distinction that shares structural similarities in common with a distinction from economic theory: products versus commodities.

Brute Force, the Power to Hurt, and the Logic of Commodity Exchange

In *Arms and Influence*, Thomas Schelling develops a distinction between 'brute force' and the 'power to hurt.' "Brute force," Schelling explains, "can only accomplish what requires no collaboration," goals such as "exclusion, expulsion and extermination."[26] In contrast, the 'power to hurt' aims at getting the adversary to 'come along' on some level: "'Come-along' holds are those that threaten pain or disablement, giving relief as long as the victim complies, giving him the option of using his own legs..." In other words, the distinction is between the different ends to which physical violence is a means. Although some forms of violence are more appropriate to brute force objectives and others more appropriate to inflicting pain in order to induce

[24] O'Neill 2006, 1.
[25] Thomas Schelling, *Arms and Influence* (New Haven: Yale University Press, 1966).
[26] Schelling 1996, 8.

compliance, the same means can be applied (short of annihilation) to either end. While clear enough in theory, in practice the difference between brute force and the power to hurt is not so simple. Both rely on the means of physical violence. As a result they may, at times, appear identical to an outside observer. The difference lies only in the intended result. In fact, obscuring intentions may be strategic. Playing on the possibility that one intends to use brute force to exclude, expel, or exterminate an adversary (even if one does not intend to go so far) can be an advantage in leveraging one's 'power to hurt' another.

Brute force is only effective against adversaries you can afford to objectify, those whose thoughts, feelings, and desires you can ignore. In contrast, the power to hurt requires that you care for the limits of what physical violence can accomplish and appropriately calibrate the level of harm you impose to activate your adversary's desire to avoid further punishment. According to Schelling, "…it is not the pain and damage itself but its influence on somebody's behavior that matters. It is the expectation of more violence that gets the wanted behavior, if the power to hurt can get it at all."[27] Physical torture to extract information is a good example of the power to hurt. The purpose of torture is not the act of creating pain in and of itself. The purpose of torture is to harness the threat of more pain to come in order to produce information that cannot be extracted through violence alone. Go too far and the desired information will be lost: "It is *latent* violence that can influence someone's choice—violence that can still be withheld or inflicted."[28] The power to hurt opens and maintains a space for interaction 'before' violence by postponing the realization of that violence indefinitely into the future. This is the space in which the practices of nuclear deterrence, arms control, and nonproliferation take place. They are all mechanisms that exist to prevent a nuclear war from happening now, and hopefully make its possibility an ever more vanishing feature of the future.

A successful deterrent leverages the power to hurt. It prevents military aggression by the threat, explicit or implicit, of imposing costs in return. This is a standard definition of a punishment-based deterrent. However, Schelling's distinction between brute force and the power to hurt suggests a further refinement. Deterrence is the act of invoking a credible threat (implicit or

[27] Schelling 1966, 3.
[28] Schelling 1966, 3.

explicit) of continued or future application of physical violence in order to discourage an action *not preventable through violence alone*. Take, for instance, a splendid first strike. A splendid first strike is a brute force attempt to destroy the opponents' nuclear capabilities and eliminate their capacity to retaliate in kind. Leveraging the power to hurt to deter a nuclear attack becomes necessary when a splendid first strike is either militarily infeasible or politically undesirable. This second definition of deterrence emphasizes that a strategy of deterrence establishes a link between violence and the realm of cooperative interaction. This is Schelling's essential insight, that models of zero-sum games do not capture the complexities of social interactions, that effective strategies—short of extermination—always leverage a combination of conflict and cooperation.

The 'power to hurt' provides the conceptual foundation for the transformation of nuclear weapons from an instrument of violence into a currency of power. This is because the power to hurt is predicated on establishing a reciprocal (though not equal) relationship with your adversary. Therefore, the material characteristics that make an object a desirable weapon are of immediate significance in evaluating the effectiveness of brute force, but of secondary importance when your goal is to leverage the power to hurt. Of primary importance is what is sometimes referred to in the literature on deterrence as their 'threat-value.' If your goal is to leverage your power to hurt to influence the behavior of your adversary, the instruments of violence at your disposal play a foundational role in placing a demand on your adversary's attention. This is their primary source of value to you, their 'threat-value.' Threat-value is only indirectly linked to the specific material properties of the weapon in question. It is not that the mechanism for the delivery of pain is irrelevant, but rather that it is of secondary importance to the behavior of one's adversary. The success of a deterrent strategy is not measured in terms of how much pain you are able to inflict, but rather in how effectively the threat of that pain influences your adversary's course of action.

The nuclear age ushered in a structural shift in the underlying purpose of organized military violence. As Bernard Brodie famously argued, "Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can

have almost no other useful purpose."[29] This shift in ends, from goals that can be accomplished through physical violence alone to goals that require cooperation, opens the door to the transformation of nuclear materials from a weapon of war to a currency of power, but this transformation is far from inevitable or complete.

At present, the system of a nuclear 'global power currency' is far from resembling anything more than the barter of commodities. Nuclear materials do not (yet) mediate relations with the same fluidity that money does. As I will explain, money is a special type of highly saleable commodity, produced and regulated for the purpose of facilitating and mediating the exchange of commodities. Developing a system in which the fissile materials necessary to sustain a chain reaction and generate a nuclear explosion (uranium 235 and plutonium) function like a currency similar to gold, or perhaps like a purpose-specific coupon or other type of special money,[30] would require further institu–tionalization of the control of fissile materials. There would need to be an institutionalization of those mechanisms, including the Fissile Material Cut-off Treaty and the further development of the system of fuel banks, designed to accentuate the qualities of fissile materials essential to their role as a currency, namely scarcity and durability.

A more accurate parallel for what Subrahmanyam referred to as 'nuclear coins' would be 'nuclear commodities.' Nuclear weapons in their role as a deterrent function much like a commodity within a barter system. Structurally, Schelling's distinction between brute force and the power to hurt mimics the Marxian distinction between a product and a commodity. The product/commodity distinction, and more specifically its roots in the labor theory of value, is not uncontroversial. The interpretation of it here is derived from the early pages of *Capital*, which even Marxist scholars find challenging and contradictory.[31] However, for the purposes of this analysis it is possible to set aside the controversial aspects of determining the basis of absolute value. What is significant for this discussion is that, like the distinction between brute force and the power to hurt, the difference between a product and a commodity exists not in the material

[29] Bernard Brodie, "The Development of Nuclear Strategy," *International Security* 2, 4, (Spring 1978): 65–83.
[30] Viviana A. Zelizer, "The Social Meaning of Money: 'Special Monies'," *American Journal of Sociology* 95, 2 (September 1989): 342–377.
[31] Arjun Appadurai, *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge: Cambridge University Press, 1986).

means available, but only in terms of the ends for which the item is intended. Products are made for personal consumption, whereas the logic of exchange governs the production of commodities. The same physical item can be either a product or a commodity depending on whether or not the owner intends to realize its value through consumption or exchange, just as a weapon can be used for brute force or the power to hurt.

Like commodities, the production of nuclear weapons is driven, not by plans for their immediate consumption, but rather by the role in a complex system of reciprocal exchange. The threat-value of nuclear weapons is always relative and reflexively determined. The (threat) value of action C is expressed through its equivalence to the value of the adversary's reaction B, and vice versa. In other words, in order for military action C to be understood as having value as a threat, a second military action B (the value of which must be equal to or less than the value of action C) must have been threatened, and it must be possible for action C to be interpreted as a meaningful response to action B (meaning that there is a level on which the two actions can be understood as commensurable). In the language of deterrence theory, the perceived costs of a retaliatory attack must exceed the perceived benefits of aggressive military action for deterrence to be successful.[32]

This logic of establishing value through relative and reflexive calculations provides a bridge to the new practices of bilateral and multilateral diplomacy in which states 'trade' on nuclear technology to achieve *political ends not achievable through violence alone*. These diplomatic negotiations take place in the time and space opened by the mutual threat of 'more to come.' A theory of nuclear weapons as a currency of power complements deterrence theory by theorizing the role of materiality in constituting this new diplomatic realm. Whereas deterrence theory concentrates attention on the physical characteristics that make nuclear weapons an effective instrument of violence, a theory of nuclear weapons as a currency of power reveals the importance of scarcity, durability, and divisibility in making nuclear weapons—and increasingly the fissile materials that are necessary to sustain a nuclear chain reaction—essential to understanding the practice of 'trading' on access to nuclear materials within this diplomatic realm.

[32] Anne Harrington de Santana, "Nuclear Weapons as the Currency of Power: Deconstructing the Fetishism of Force," *Nonproliferation Review* 16, 3 (November 2009).

Arguably countries like North Korea and Iran have responded successfully to the emergent incentives of this system in which flirting with crossing a nuclear threshold, or hedging, can open negotiations with one or more of the nuclear weapons states. In this way both North Korea and Iran, by first developing and then giving up a portion of their nuclear capabilities have been able to secure other goods (ends not achievable through violence alone), including, for instance, food aid and the lifting of sanctions. Iraq, in contrast, (one of the states that O'Neill points to as evidence for his theory of prestige) failed to understand the structural incentives and was caught without any nuclear materials or illicit activities to trade away. Far from the desire for prestige, these strategies resulted in tangible costs and benefits.

Increasingly what we are seeing is a choice between thickening an international nonproliferation regime dedicated to maintaining the characteristics that may some day make fissile materials an effective currency of power and contribute to the project of disarmament through the gradual disembodiment of nuclear weapons, or a return to a world of naked deterrence and brinksmanship. Confidence in that system, even today, remains closely linked to the underlying access to brute force afforded by nuclear weapons. However, that does not mean that a transformation toward a thicker system of arms control and nonproliferation could not provide a means for reducing the dependence on an ever-present nuclear threat to maintain the system of strategic stability.[33]

But Nuclear Weapons Still Explode

The most common objection to this project is the fact that, unlike a currency such as gold, "nuclear weapons still explode." There are usually one of two intuitions behind this objection. The first is a basic misunderstanding of currency and its relationship to materiality. In the United States and Western Europe it is entirely possible to take for granted the experience of money as digits on a screen, but that is a relatively new and rare phenomenon. Therefore, I open this section with a basic explanation of gold as an example of what I mean by currency. The second

[33] Dan Deudney, *Bounding Power: Republican Security Theory from the Polis to the Global Village* (Princeton: Princeton University Press, 2008).

intuition behind the objection is an imagination of currency as emerging out of relationships of cooperation in which the problem of violence has been previously solved. This objection often comes from individuals with a neorealist orientation who generally view international institutions as simply epiphenomenal of great power interests. I point this out because these same individuals also tend to gravitate toward a similar understanding of money (the Mengerian theory of money). There are, in fact, many theories of money, most of which take relationships of violence and power as endemic to the emergence of money. The implicit theory of money in this paper is most closely associated with Georg Simmel.[34]

Currency is a special commodity, one that is particularly salable because it has been collectively deemed to be a medium of exchange. Currencies take many forms. The money that we use as currency in today's digital age is disembodied to a historically unprecedented extent. Today our confidence in the global financial system is linked to the credibility of the United States' government to maintain the value of its dollar. Historically, however, confidence in the value of currencies was more closely linked to their material properties. Until President Richard Nixon abandoned the gold standard in 1971, gold backed all US dollars, meaning that every US dollar could be exchanged for an equivalent amount of gold.

Gold has a number of characteristics that make it appropriate to serve as a currency. It is scarce, durable, and divisible. Unlike paper money (which is artificially scarce), gold is naturally scarce, meaning there is a limited supply of it found in nature. It cannot be manufactured, except (ironically) through bombardment in a nuclear reactor or intense neutron source. The gold manufactured through this process is, however, radioactive and therefore not appropriate to be circulated as currency. Gold is durable, meaning it does not decay over time, and by heating it, gold becomes divisible into measurable units of different quantitates.

Gold also possesses many other material properties that make it useful, not only as a medium of exchange, but also as a product of consumption. It is unusually malleable, conducts electricity, will not tarnish, is a good metal alloy, and can be worked into wires or sheets. All of these sensuous qualities mean gold has many applications in addition to its role as a medium of

[34] Georg Simmel, *The Philosophy of Money* (London: Routledge & Kegan Paul, 1978).

exchange.[35] Dentists use gold as a tooth filling, aerospace engineers as a lubricant and protective shield, and electrical engineers as a conductor. Small amounts of it exist in many of our appliances and computers.[36]

The idea that gold is valuable, not only because it is a medium of exchange, but also because it valuable in an absolute sense, accords with a certain common-sense understanding of how money works. It corresponds more or less to the barter theory of money, which is associated with the Austrian school of economic thought and the work of Carl Menger. The intuition behind this approach is the idea that money exists because it solves the basic problem of barter. Namely, in order to make a successful trade you have to find someone else who both has something you want and that wants what you have to give. This may be difficult, however, depending on how salable the commodity you have is. First, you may have to make a trade for something that you do not want simply because it is more salable than what you had before. In this way you increase your probability of securing that thing you ultimately want. Over time communities converge around certain commodities that are eventually universally accepted as money. Once a commodity is universally accepted as money it is differentiated from other commodities by the fact that it becomes increasingly more salable and it is sought after purely because of its function as a medium of exchange.[37]

The commodity theory of money accords most closely with the realist interpretation of the power of nuclear weapons. The similarities are not accidental. In fact, Waltz's book *Theory of International Politics*, which continues to be a touchstone for the American field of International Relations more than four decades after its publication, draws explicit parallels between the structural realist theory he develops and the brand of neoclassical economic theory closely associated with the Austrian school. Just as the basic laws of supply and demand arise from the interaction of firms, the laws that govern state behavior are not imposed by an external political

[35] Karl Marx, *Capital: A Critique of Political Economy*, Vol. I (New York: Vintage Books, 1977), 164. In economics it is a distinction that has been picked up and turned over by many people. I return to Karl Marx for my preferred formulation, though discussions of it can be found in any text concerned with understanding the sources of economic value; quotations could just as easily be drawn from Adam Smith or Georg Simmel.
[36] Scottsdale Bullion & Coin, May 30, 2012, accessed October 31, 2015, www.sbcgold.com/blog/top-6-common-uses-for-gold.
[37] Nigel Dodd, *The Social Life of Money* (Princeton: Princeton University Press, 2014), Kindle edition, pp. 16–19.

authority, but rather arise from the interaction of states under the condition of anarchy. In order to complete the analogy, power for Waltz must then function much like money, which he achieves by assuming perfect fungibility between power and its resources.[38]

Nuclear weapons, within this neorealist framework, are the ultimate form of power. Just as money emerges out of a barter system by solving the problems of inefficiency, nuclear weapons as a new commodity form emerge out of state-based interactions by solving the problem posed by the inefficiency (or more specifically, the irrationality) of nuclear war. Likewise, as for Menger, where the commodity that emerges as a universal equivalent does so not simply because of the qualities that make it an appropriate money form (scarcity, durability, divisibility), but also because it is a more saleable commodity in its own right, the emergence of nuclear weapons as a special form of weapon that achieves a suprasensible status as an object of exchange is not separable from their absolute value as an instrument of violence. Within a realist framework, the capacity for violence is ultimately the source of a nuclear weapon's power.

However, as Nigel Dodd explains in his book, *The Social Life of Money*, there are competing theories of money. There is the debt theory of money, which is most closely associated with Maynard Keynes, there is Georg Simmel's philosophy of money, there is Marcel Maus' description of money's relationship to gift exchange, or an adaptation of Rene Gerard's theory of money as the product of a system based on mimesis and violence. Unlike the Austrian school's idea of money as emerging from barter between equals, many of these other theories emphasize money's relationship to power, violence, sacrifice, and authority. They challenge the image of commerce as a realm of exchange free of power politics, instead emphasizing the pacifying effects of monetary exchange.

Take for instance the Keynesian model. Money grows out of the practice of paying tribute, or offering sacrifice. It is rooted in obligation and originates in a debt to the gods. There is evidence, for instance, of associations between early Greek coinage and sacrificial objects,

[38] Robert O. Keohane, "Theory of World Politics: Structural Realism and Beyond," in *Neorealism and Its Critics* (see note 18), 167.

particularly iron spits (etymologically, the Greek 'drachma' means "a handful of spits").[39] The crucial point here is that money does not emerge out of a commercial relationship between equals, but rather is a tax paid to a political or religious authority. Money does not exist independently of the state in a purely commercial sphere, but rather is a product of state authority. This alternative Keynesian framing carries with it very different policy implications than the Austrian model described above in that it prescribes a much larger role for the state in managing the value of money.

A Keynesian model of money in application to nuclear strategy points towards the necessity of a world state. The role of the state in the debt theory of money suggests that, for nuclear weapons to continue to develop as a power commodity, a supranational authority with the ability to impose obligations on states and regulate the value of a 'nuclear currency' will be necessary. This interpretation of money as deriving its power from the authority of social institutions leads to the conclusion that the violence of nuclear weapons is necessary to their power unless or until a world state with a legitimate monopoly on the use of violence displaces the role of nuclear weapons in maintaining a stable deterrent.

Georg Simmel offers yet another alternative. He theorizes exchange as a process of "reciprocal surrender" or "mutual sacrifice" because to "*gain* something, we must simultaneously *lose*."[40] The objects that are valuable to us are the ones that resist our desires and are most difficult to acquire. In other words, they are the most valuable precisely because their gain entails the greatest loss. Value, and money as its embodiment, is the quantification of this loss; it is a measure of the distance between a subject and his or her object of desire. Simmel's theory has many more dimensions, but what is essential to take away from it for the purpose of this discussion is that this process of quantification introduces an element of detachment from the underlying object. As Dodd explains it: "money represents the generic *idea* of value. By virtue of its objective and abstract character, money is capable of standing in for *any* specific, concrete value in the process of exchange."[41] Money as a universal equivalent inserts a new element into

[39] Dodd 2014, 23–5.
[40] Dodd 2014, 27. Italics in original.
[41] Dodd 2014, 29. Italics in original.

the process of exchange, one that changes the character of the relation between both the subjects engaged in a reciprocal act of exchange and their relationship to the objects of their desire. This is an evolutionary story about how money constitutes relations. The argument is that money through the act of quantification introduces a new element into social processes.

In so far as the act of quantification enables the reification of social value and enables the alienation of subjects from the fruits of their labors, this act of quantification is a frequent subject of critique. However, arguably, the processes of quantification that constitute nuclear war plans and arms control negotiations enable the transition from a world of violent conflict to *the achievement of ends that could not be achieved through the application of violence alone*. Deterrence provides the underlying logic of equivalence, but once quantification is introduced through arms control, the character of the process changes. There is a level of abstraction inserted between the military requirements of deterrence and what would become the standard practice of agreeing upon equal numbers. According to Steve Kull, the moment at which the relative value of nuclear weapons was divorced from any direct relationship to an underlying basis in material effects was during the Strategic Arms Limitation Talks (SALT). Kull argues that the substitution of a numerical balance of nuclear forces for a military strategic analysis became a matter of official US policy with the ratification of the SALT I Treaty in 1972. At the time of the negotiations, the negotiators of the treaty were primarily concerned with its strategic military implications, and thus, in the spirit of détente, were willing to accept numerical inferiority in some areas for superiority in others. However, when ratifying the treaty, the Senate added an amendment stating that the United States would negotiate a subsequent treaty with the Soviet Union that "would not limit the United States to levels of intercontinental strategic forces inferior to the limits for the Soviet Union."[42]

Up until this time, the nuclear arms race between the two countries had been driven by the logic of counterforce targeting, which meant that the relative value of nuclear weapons maintained a basis in military utility. The US and Soviet arsenals were tied to one another through the military practice of targeting. Although the illogic of the size of the arsenals was too apparent to ignore entirely, especially for those with top-secret knowledge of the intimate details, the legitimacy of

[42] Steve Kull, "Nuclear Nonsense," *Foreign Policy*, No. 58 (Spring 1985): 28–52.

the nuclear arsenal was still maintained with respect to the value of destructive effects of the weapons.

Arms control transformed the basis of the threat-value of nuclear weapons by politicizing numerical equivalence at the expense of military utility. As US Secretary of Defense under President Jimmy Carter, Harold Brown, argued in defense of START II: "The United States and its allies must be free from any coercion and intimidation that could result from perceptions of an overall imbalance or particular asymmetries in nuclear forces.… Insistence on essential equivalence guards against any danger that the Soviets might be seen as superior—even if the perception is not technically justified."[43] Negotiated limits on the value of the US and Soviet arsenals moved the basis upon which the relative value of nuclear weapons is calculated from material effects (as senseless as understanding those effects in relative terms may be) to a basis in the political perception of relative equality.

Conclusion

Contrary to the assumption that, due to the inherent violence of nuclear weapons, there is a limit to the application of the analogy between currency and the role of nuclear materials in mediating international conflict, I argue that this limitation is overcome by the same distinction that Thomas Schelling developed to cope with the irrationality of mutual assured destruction. The similarities between deterrence theory and economic theory begin with Schelling's distinction between 'brute force' and the 'power to hurt.' This distinction is central to debates about nuclear strategy. It provides the conceptual foundation for the 'rationality of irrationality'—Schelling's idea that it is rational to threaten an act of brute force in order to leverage one's power to hurt, even if it would be irrational to act on that threat in the final instance.

Yet despite—or maybe because of—its centrality, the distinction between brute force and the power to hurt remains obscure relative to its significance. Compared to first-strike versus second-strike capability, or counterforce versus countervalue targeting, the brute force/power to hurt distinction remains underdeveloped. The argument in this paper, therefore, makes a unique contribution to deterrence theory, one that improves the ability of deterrence theorists to 'make

[43] Kull 1985, 33.

sense' of the strategies of non-nuclear weapon states by connecting deterrence theory to the transformation of nuclear weapons from an instrument of violence to a currency of power. Whereas deterrence theory concentrates attention on the physical characteristics that make nuclear weapons an effective instrument of violence, a theory of nuclear weapons as a currency of power reveals the importance of scarcity, durability, and divisibility in making nuclear weapons—and increasingly, the fissile materials that are necessary to sustain a nuclear chain reaction—essential to understanding the practice of 'trading' on access to nuclear materials within this diplomatic realm.

By grounding a theory of nuclear weapons as a currency of power in the foundational categories of deterrence theory this paper brings a new perspective to contemporary debates about nuclear deterrence and nonproliferation. For instance, it brings an added level of theoretical depth to Vipin Narang's arguments about "catalytic deterrence," a nuclear deterrence strategy designed to draw the attention of a third party.[44] It also interacts with the contemporary debates about disarmament, including Nick Ritchie's development of the idea of 'devaluing' nuclear weapons as a key element of moving toward a nuclear weapon free world.[45] Finally, it provides new insights into the nuclear strategy of non-nuclear weapon states, like Iran, who have already begun leveraging the production of nuclear materials by engaging in a strategy of 'weaponless nuclear deterrence-by-denial'—simultaneously flirting with the possibility of crossing the nuclear threshold to garner international attention and maintaining a credible commitment to their 'peaceful' nuclear program by making it difficult to destroy. That attention became a key component of a high-stakes foreign policy and military strategy to change Iran's standing vis-à-vis the established nuclear weapon states and become a recognized regional power.

[44] Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton, NJ: Princeton University Press, 2014).
[45] Nick Ritchie, "Valuing and Devaluing Nuclear Weapons," *Contemporary Security Policy* 34, 1 (2013).