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Timing bombs and the temporal dynamics of Iranian nuclear security

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Abstract
For more than two decades, Iran's nuclear programme has concerned policymakers and scholars alike. Whether speeding up uranium enrichment, slowing down international negotiations, or disrupting the timing of key initiatives, actions around Iran's nuclear programme bear a clear time signature. Yet systematic accounts of the importance of time in shaping foreign and security policymaking have been largely neglected. Through foreign policy timing theory's (FP4D) reconceptualisation of time we show how actors both constructed and then used time to pursue their strategic interests, creating, altering, and sabotaging the timing mechanism linking Iranian nuclear technology and international sanctions. These manipulations of time by both domestic and international actors resulted in prolonged international negotiations and fluctuating periods of crisis and produced a temporally flawed agreement frozen in time. We consider time's impact on the current challenges and future direction of nuclear diplomacy with Iran as well as its importance for broader nuclear security issues.

Keywords: foreign policy; Iran; JCPOA; nuclear security; time

Introduction

From the moment Iran first announced its intention to master the nuclear fuel cycle in 2003 until the efforts to revive the Joint Comprehensive Plan of Action (JCPOA) nearly two decades later, Iran's nuclear programme and the international efforts to constrain it have been a race against time. While key actors' preferences have remained relatively stable, with Iran asserting its right to pursue a peaceful nuclear programme and other international actors opposed to Iran obtaining nuclear weapons, foreign policies have nevertheless been changing along temporal lines. The Obama administration shifted away from *never* to *eventually* allowing Iran to enrich uranium along a closely managed timeline. Intense multilateral negotiations followed, including the creation of *breakout time* – the time it would take Iran to produce enough nuclear material for one bomb. The Trump administration objected to the JCPOA agreement, arguing it would still *in time* allow Iran to obtain nuclear weapons. After wielding unheeded deadlines and temporal ultimatums, Trump finally abandoned the deal, sending European signatory states scrambling to preserve it. Intensifying economic sanctions eventually pushed Iran to accelerate, but not dash, towards nuclear breakout. The Rouhani and then Biden administrations aimed to revive negotiations but were subverted by Iranian lawmakers' mandating further acceleration of uranium enrichment, followed by the new hard-line President Raisi's determination to slow any return to negotiations, leaving them essentially frozen in time.

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The threat from a nuclear Iran – real or perceived – and its potential consequences for the security and stability of the Middle East have led to two decades of intense diplomacy. Given the complexity and significance of the Iranian nuclear issue, it is not surprising it has engaged numerous scholars using varying approaches.[1] Much of this work has focused on Iran's material[2] and ideational[3] motivations driving its nuclear ambitions, while others have looked at fluctuations in its nuclear behaviour through the domestic politics lens.[4] Speculation about the potential consequences of Iran's acquisition of nuclear weapons,[5] as well as shortcomings, costs, and benefits of different policy options in preventing a nuclear Iran have also drawn scholarly attention.[6] But the importance and impact of the role of time is outside the scope of theoretical explanations in this existing research. Instead, time largely serves as an atheoretical background medium – something through which other factors operate, such as different actors' material, political, or ideational interests or motivations *over time*.

We argue that an analytical focus on time itself can account for significant features of the Iran case, because at its heart is a foreign policy timing problem – *when and how quickly* Iran could cross the nuclear threshold and what could be done to slow or stop it.[7] Examining decision-making around such timing problems – defined as situations seen by policymakers to involve controlling the temporal relationship between two or more dynamic change processes – demands specific analytical attention to the concept of time. But foreign and security policymaking scholars have lacked a theoretical framework specifically about time, and time can do no theoretical work unless it is theorised.[8] Instead, analyses have largely relied on a traditional or common-sense view of time as an objective, linear, and external constraint on decision-makers.[9]

[1]See James K. Sebenius and Michael K. Singh, 'Is a nuclear deal with Iran possible? An analytical framework for the Iran nuclear negotiations', *International Security*, 37:3 (2012), pp. 52–91.

[2]See Gawdat Bahgat, 'Nuclear proliferation in the Middle East: Iran and Israel', *Contemporary Security Policy*, 26:1 (2005), pp. 25–43; David H. Dunn, 'Real men want to go to Tehran: Bush, pre-emption and the Iranian nuclear challenge', *International Affairs*, 83:1 (2007), pp. 19–38; Kenneth N. Waltz, 'Why Iran should get the bomb: Nuclear balancing would mean stability', *Foreign Affairs*, 91:4 (2012), pp. 2–5; Ways Bowen and Matthew Moran, 'Iran's nuclear program: A case study in hedging', *Contemporary Security Policy*, 35:1 (2014), pp. 26–52.

[3]See Ray Takeyh, *Hidden Iran: Paradox and Power in the Islamic Republic* (New York: Henry Holt, 2006); Shahram Chubin, 'Iran's power in context', *Survival*, 51:1 (2009), pp. 165–90; Maximilian Terhalle, 'Revolutionary power and socialization: Explaining the persistence of revolutionary zeal in Iran's foreign policy', *Security Studies*, 18:3 (2009), pp. 557–86; Homeira Moshirzadeh, 'Discursive foundations of Iran's nuclear policy', *Security Dialogue*, 38:4 (2007), pp. 521–43; Ty Solomon, 'Status, emotions, and US–Iran nuclear politics', in Simon Koschut (ed.), *The Power of Emotions in World Politics* (Abingdon: Routledge, 2020), pp. 130–48.

[4]Etel Solingen, *Nuclear Logics: Contrasting Paths in East Asia and the Middle East* (Princeton, NJ: Princeton University Press, 2007); Halit M. Tagma and Ezgi Uzun, 'Bureaucrats, ayatollahs, and Persian politics: Explaining the shift in Iranian nuclear policy', *The Korean Journal of Defense Analysis*, 24:2 (2012), pp. 239–64; Thomas Juneau, *Squandered Opportunity: Neoclassical Realism and Iranian Foreign Policy* (Palo Alto, CA: Stanford University Press, 2015).

[5]See James M. Lindsay and Ray Takeyh, 'After Iran gets the bomb: Containment and its complications', *Foreign Affairs*, 89:2 (2010), pp. 33–49; Eric S. Edelman, Andrew F. Krepinevich, and Evan Braden Montgomery, 'The dangers of a nuclear Iran: The limits of containment', *Foreign Affairs*, 90:1 (2011), pp. 66–81.

[6]See Michael McFaul, Abbas Milani, and Larry Diamond, 'A win–win US strategy for dealing with Iran', *The Washington Quarterly*, 30:1 (2007), pp. 121–38; Scott D. Sagan, 'How to keep the bomb from Iran', *Foreign Affairs*, 85 (2006), pp. 45–59; Masoud Kazemzadeh, 'US–Iran confrontation in the post-NIE world: An analysis of alternative policy options', *Comparative Strategy*, 28:1 (2009), pp. 37–59; James Dobbins, 'Coping with a nuclearising Iran', *Survival*, 53:6 (2011), pp. 37–50; Paul R. Pillar, Robert Reardon, and Michael K. Singh, 'Nuclear negotiations with Iran', *International Security*, 38:1 (2013), pp. 174–92; Matthew Kroenig, 'The return to the pressure track: The Trump administration and the Iran nuclear deal', *Diplomacy & Statecraft*, 29:1 (2018), pp. 94–104.

[7]Amnah Ibraheem and William Alberque, 'Iran approaches the nuclear threshold', *International Institute for Strategic Studies* (10 November 2022), available at: {https://www.iiss.org/blogs/analysis/2022/11/iran-approaches-the-nuclear-threshold}; Jacques E. C. Hymans and Matthew S. Gratias, 'Iran and the nuclear threshold: Where is the line?' *The Nonproliferation Review*, 20:1 (2013), pp. 13–38.

[8]Nathaniel Beck, 'Time is not a theoretical variable', *Political Analysis*, 18:3 (2010), pp. 293–4.

[9]But see Mirko Palestrino, 'Neglected times: Laclau, affect, and temporality', *Journal of Political Ideologies*, 27:2 (2022), pp. 226–45.

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Such a view of time is inadequate for understanding timing problems and policymakers' responses to them because it neglects different ways decision-makers see time as a constitutive feature of the foreign policy problems they face, and it minimises actors' agency over time as a policymaking tool. Drawing on and extending the foreign policy timing theoretical framework (hereafter FP4D),[10] which builds from timing theory,[11] we conceive of time as variable and constructed rather than fixed and objective, and as a tool policymakers actively manipulate in pursuit of their foreign policy objectives. Because this conception of time is a dynamic one involving the intentional linking together – timing – of different change processes, we can examine how policymakers manage timing problems and the challenges they face in doing so.

Through FP4D we examine the JCPOA agreement as a timing standard, demonstrating how time was constructed and used to manage Iran's nuclear behaviours. Specifically, the JCPOA negotiations represented a temporal foreign policy shift, from prevention and pre-emption to one aimed at containing and managing Iran's developing nuclear programme. It did so by defining the key features of its nuclear activity and then systematically and intentionally connecting them to the intensification or reduction of international sanctions. This, we argue, pushed foreign policy actors to employ temporal rhetoric and engage in various time tactics designed to influence the pace, sequence, and duration of these foreign policy behaviours. While existing research has paid extensive attention to the *effectiveness* of linking different types of actions to desired behavioural changes,[12] we instead examine the *process* of how decision-makers intentionally *time* such changes with one another to better control them. This processual view of time provides a different perspective not just on effectiveness but also on broader challenges around keeping change processes linked. It reframes commitment problems, for example, as challenges associated with time itself rather than as linear temporal concerns actors have in the present over future reneging.[13]

The concept of FP4D also foregrounds agency, demonstrating how decision-makers adopt different temporal orientations and take initiatives to grapple with timing problems. In the Iran case, we show how supporters or opponents of the JCPOA accord employed different time tactics targeting the pace, sequence, duration, and timing at the heart of the agreement. These actions not only produced a long period of intense international interactions but also influenced both escalations and de-escalations of crises and affected domestic decision-making dynamics in both the United States and Iran. Ultimately, these timing efforts resulted in an agreement with puzzling temporal problems and the prospects of a future resolution unexpectedly becoming frozen in time.

We begin by presenting timing theory and its derivative FP4D framework. We both extend FP4D and clarify its value as an approach to time in foreign policy by elaborating the temporal dissonance associated with foreign policy timing problems and proposing key expectations about temporal rhetoric and foreign policy initiatives focused on time. We then discuss the value of the Iran case for our investigation before examining its main phases and how international and domestic actors used time as a foreign policy tool to pursue their own preferred goals. We demonstrate the

[10] FP4D ('foreign policy in the fourth dimension') is an explanatory theoretical framework focused on decision-making – see Ryan K. Beasley and Andy R. Hom, 'Foreign policy in the fourth dimension (FP4D): Locating time in decision-making', *Foreign Policy Analysis*, 17:2 (2021), available at: {https://doi-org.ezproxy.st-andrews.ac.uk/10.1093/fpa/oraa028}; Andy R. Hom and Ryan K. Beasley, 'Constructing time in foreign policy-making: Brexit's timing entrepreneurs, malcontemps and apparatchiks', *International Affairs*, 97:2 (2021), pp. 267–85.

[11] Andrew R. Hom, *International Relations and the Problem of Time* (Oxford: Oxford University Press, 2020); Andrew R. Hom, 'Timing is everything: Toward a better understanding of time and international politics', *International Studies Quarterly*, 62:1 (2018), pp. 69–79. Other International Relations approaches to time include Kimberly Hutchings, *Time and World Politics: Thinking the Present* (Manchester: Manchester University Press, 2008); Tom Lundborg, *Politics of the Event: Time, Movement, Becoming* (Abingdon: Routledge, 2011); Ty Solomon, 'Time and subjectivity in world politics', *International Studies Quarterly*, 58:4 (2013), pp. 671–81; Daniel Drezner, 'Power and international relations: A temporal view', *European Journal of International Relations*, 27:1 (2021), pp. 29–52.

[12] Cf. Dursun Peksen, 'When do imposed economic sanctions work? A critical review of the sanctions effectiveness literature', *Defence and Peace Economics*, 30:6 (2019), pp. 635–47; Alex Vines, 'The effectiveness of UN and EU sanctions: Lessons for the twenty-first century', *International Affairs*, 88:4 (2012), pp. 867–77.

[13] James D. Fearon, 'Rationalist explanations for war', *International Organization*, 49:3 (1995), pp. 379–414.

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effects of timing in shaping the JCPOA negotiations and final agreement, contestation and opposition to it, and its outcomes. We then offer conclusions reflecting on our findings before considering their implications for future nuclear security negotiations and for broader applications of FP4D to questions of international security.

Timing theory and FP4D

> It's a matter of timing … successful presidents – better than me – have been successful, in large part, because they know how to time what they're doing.[14]
>
> – President Joe Biden, 25 March 2021

Foreign and security policymaking scholars most often see time as a background feature over which events and decision-making occur. Whether dealing with time pressure during crises,[15] sequential decisions,[16] decision-stages,[17] or feedback and foreign policy change,[18] the concept of time is a sort of canvas upon which scholars paint their picture of more important policymaking phenomena. Some research includes time through temporal biases[19] and the importance of the shadow of the future and time horizons,[20] while other work examines the importance of temporal features in international negotiations.[21] With regard to nuclear security, some have assessed the timing of nuclear proliferation, reversal, or other nuclear activities by focusing on motivations of individual leaders,[22] organisational interests or pressure,[23] and change in the domestic power structure.[24] But even these explicitly temporal approaches still largely see time either as a linear if subjective reckoning of the past or future in relation to the present, or as an objective background pressuring or constraining fallible actors. Agents may be seen as thinking about time or travelling

[14]Joseph R. Biden, 'Remarks by President Biden in press conference', *White House*, 25 March 2021, available at: {https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/03/25/remarks-by-president-biden-in-press-conference/}.

[15]Charles F. Hermann, 'Some consequences of crisis which limit the viability of organizations', *Administrative Science Quarterly*, 8:1 (1963), pp. 61–82; Patrick J. Haney, *Organizing for Foreign Policy Crises: Presidents, Advisers, and the Management of Decision Making* (Ann Arbor: University of Michigan Press, 2002); Amnon Aran and Gad Yishayahu, 'Updating the study of foreign policy crisis: The case of the Mavi Marmara flotilla', *Foreign Policy Analysis*, 18:3 (2022), available at: {https://doi.org/10.1093/fpa/orac007}.

[16]Binnur Ozkececi-Taner, 'Reviewing the literature on sequential/dynamic foreign policy decision making', *International Studies Review*, 8:3 (2006), pp. 545–54.

[17]Alex Mintz, 'How do leaders make decisions? A poliheuristic perspective', *Journal of Conflict Resolution*, 48:1 (2004), pp. 3–13.

[18]Charles C. Hermann, *When Things Go Wrong: Foreign Policy Decision Making under Adverse Feedback* (New York: Routledge, 2012).

[19]Ronald R. Krebs and Aaron Rapport, 'International relations and the psychology of time horizons', *International Studies Quarterly*, 56:3 (2012), pp. 530–43.

[20]Robert Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984); Monica Duffy Toft, 'Issue indivisibility and time horizons as rationalist explanations for war', *Security Studies*, 15:1 (2006), pp. 34–69; Philip Streich and Jack S. Levy, 'Time horizons, discounting, and intertemporal choice', *Journal of Conflict Resolution*, 51:2 (2007), pp. 199–226; David M. Edelstein, *Over the Horizon: Time, Uncertainty, and the Rise of Great Powers* (Ithaca, NY: Cornell University Press, 2006).

[21]Peter J. D. Carnevale and Edward J. Lawler, 'Time pressure and the development of integrative agreements in bilateral negotiations', *Journal of Conflict Resolution*, 30:4 (1986), pp. 636–59; William I. Zartman, 'The timing of peace initiatives: Hurting stalemates and ripe moments', *The Global Review of Ethnopolitics*, 1:1 (2001), pp. 8–18; Marco Pinfari, 'Time to agree: Is time pressure good for peace negotiations?', *Journal of Conflict Resolution*, 55:5 (2011), pp. 683–709; Fearon, 'Rationalist explanations for war'.

[22]Jacques E. C. Hymans, *The Psychology of Nuclear Proliferation: Identity, Emotions and Foreign Policy* (Cambridge: Cambridge University Press, 2006).

[23]Peter Liberman, 'The rise and fall of the South African bomb', *International Security*, 26:2 (2001), pp. 45–86; Scott Curtice, *Why Do States Build Nuclear Weapons? Proliferation Models as Concurrent Pressures on a State* (Maxwell, AL: Air Command and Staff College, 2021).

[24]Thazha Varkey Paul, *Power versus Prudence: Why Nations Forgo Nuclear Weapons* (Montreal: McGill-Queen's Press-MQUP, 2000).

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through it, but time is not explicitly theorised, and agents are viewed as having a linear conception of time with no control over it.

Timing theory gives us a different view, where agents can vary in how they both construct and manipulate time, opening new avenues for examining the role of time in foreign policymaking. Timing theory begins by conceiving of time as the relationship between or among change dynamics occurring across two or more actors or events.[25] When we time a runner, for example, we compare the changes of a clock's hands to changes in the location of the runner. Faster runners change location more than slower runners *relative to the same amount of change* of the clock's hands. There is no need to objectify time here by trying to connect the changes in a clock's hands to some deeper fundamental *true time*. How much time something took to happen is simply a standard reference point of change, and slowing down or speeding up the hands of the clock do nothing to affect our comparison of two runners. In this view 'clock-time' functions as a sort of *standard* against which change comparisons can be made, even allowing comparisons across different spatial locations or happening at entirely different moments – such as runners setting new world records.

Beyond comparisons, such a standard can greatly facilitate the actual *coordination* of different changes or activities, even if it has nothing to do with true time. Clocks and clock-like ordering devices such as hours, months, and years, of course, were human inventions that assisted greatly with this sort of coordination. But efforts to establish local and global time were fraught with intense negotiations and political conflict, fully demonstrating time's political and social construction.[26] Getting to say what time it 'really is' somewhere was crucial for coordinating activities and ensuring that passengers could know when to catch trains, ships could determine when they should arrive at port, and all manner of interactions, transactions, and coordinated efforts could be better *timed*. From this view, increasing the precision of our time-measuring devices (such as atomic clocks) is not about getting closer to true time but instead enhances our ability to precisely coordinate and manage disparate changing events so they turn out according to our preferences. In this way, clock-time is a *timing standard*, a reference point that helps coordinate a wide range of activities, pushing people, organisations, and states to speed up or slow down to remain in time with one another.

Being so pervasive and crucial, timing theory argues that time has come to be seen as objectively real, rather than a practical human invention.[27] Indeed, *time* became a noun, with all the attendant privileges such as being fixed, measurable, and modifiable with adjectives rather than adverbs, such as 'great time', 'ripe time', or 'down time'. Time as an object can itself have verb-behaviours: it can fly, run out, slip away, or even stop. Indeed, our deeply rooted conception of time's objectivity leads us to see all verb-events happening *over time*, solidifying time into a fixed common denominator (see Figure 1, left side). This, both conceptually and linguistically, hides or obscures the original – and processual – purpose of inventing time: *to time different change events together*. Referring to the verb *timing* instead of the noun *time* immediately demands an answer to the question 'which two (or more) changes are being timed?' Runners and a stopwatch? The arrival of goods at a port and the arrival of a ship to carry them? Once unmoored from its seemingly objective and independent noun-like qualities, time can be seen as any number of overarching timing standards – rubrics, rules, or systems – that facilitate the coordination of various change activities (see Figure 1, right side).

This notion of timing differs from our common clock-time idiomatic use of 'timing'.[28] Scholars often refer to the 'timing' of events in relation to one another, sometimes as the coincidence of

[25]Hom, *Problem of Time*.

[26]Hutchings, Time and World Politics; Christopher McIntosh, 'Theory across time: The privileging of time-less theory in International Relations', *International Theory*, 7:3 (2015), pp. 464–500; Tim Stevens, *Cyber Security and the Politics of Time* (Cambridge: Cambridge University Press, 2016); Tim Stevens, 'Governing the time of the world', in Andrew R. Hom, Christopher McIntosh, Alasdair Mckay, and Liam Stockdale (eds), *Time, Temporality, and Global Politics* (Bristol: e-IR Press, 2016), pp. 59–72.

[27]Hom *Problem of Time.*

[28]Hom, *Problem of Time*, pp. 32–3.

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Figure 1. Time versus timing.

events, like bumping into an acquaintance ('great timing that we happened to bump into one another'), and sometimes as an intentional intervention into an ongoing process or series of events (the 'ripe moment' for a peace initiative).[29] For timing theory, timing is instead the construction of time via a timing standard that intentionally seeks to coordinate, integrate, or otherwise synthesise different changing processes, actors, or events so that they turn out in one way rather than another.[30] Thus timing theory entails agency, which is absent in notions of coincidental 'timing' and involves the construction of a timing standard which is not present in notions of the 'timing' of 'ripe moment' interventions.

Timing standards provide 'the organizing rubric for stitching disparate changes, processes, and agents together into a coherent and orderly whole'.[31] They come in many forms, such as very expansive efforts systematically coordinating or linking a vast array of processes and interactions, as was done by establishing Coordinated Universal Time. While metered clocks and calendars can serve as timing standards, many other less mechanistic timing devices can do this as well. Domestically, for example, the construction of an 'election day' serves as a timing standard a government uses to coordinate the expression of a mass of individuals' political preferences. These otherwise asynchronous and scattered preferences, through the creation of a timing standard, regulate citizens towards democracy.[32]

Foreign policy timing theory (FP4D)

The concept of FP4D develops timing theory within foreign and security policymaking, viewing the construction of timing standards as efforts by decision-makers to intentionally exert influence or control over international actors or events.[33] Foreign policy timing standards can take a variety of forms. They can be abstract and general, such as policymakers proclaiming a period of 'wartime' to discipline citizens and soldiers to a new set of practices and way of life.[34] They can also be more explicit, concrete, or technical, such as specifying the formal procedures for interactions in a military alliance, a negotiated economic agreement regulating inter-state commercial activities, or even rules and norms establishing the relationship between or among different domestic actors in the making of foreign policy.[35] In whatever form, such timing standards serve to purposefully establish and define dynamic relationships, orient actors to different change processes, and exert control over those actors and processes towards preferred foreign policy outcomes.

Foreign policy timing problems involve situations facing policymakers that raise their concerns about the relationship between two or more different change processes. FP4D sees these concerns as giving rise to *temporal dissonance* – like the growing asynchrony between a video and its audio track – increasing pressure to (re)align events into a preferred order. Just as cognitive dissonance involves an uncomfortable tension that arises from inconsistent thoughts or beliefs, pushing individuals to resolve the inconsistency in some fashion,[36] perceived timing disruptions can give rise

[29]Zartman, *The Timing of Peace Initiatives*.

[30]Hom, *Problem of Time*.

[31]Hom, *Problem of Time*, p. 35.

[32]Timing theory suggests many different change dynamics, whether material or ideational, can potentially be timed, such as identities or narratives. See Hom, *Problem of Time*.

[33]Beasley and Hom, 'FP4D'.

[34]Andrew R. Hom and Luke Campbell, 'Wartime in the 21st century', *International Relations*, 36:4 (2022), pp. 525–46.

[35]Hom and Beasley, 'Constructing time'.

[36]Leon Festinger, *A Theory of Cognitive Dissonance* (Stanford, CA: Stanford University Press, 1957).

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to temporal dissonance. Because timing standards define and orient actors to important change dynamics in ways that facilitate both understanding and control, perceived timing disruptions motivate foreign policy actors to realign things into a more predictable, stable, and efficacious order. They can do so by reinforcing or slightly modifying a faltering timing standard, but also by developing one anew that seeks to better time change dynamics towards temporal consonance.[37] While actors' foreign policy preferences specify the important actors, processes, and events that matter, it is the nature of the relationship among them that drives temporal dissonance, motivating policymakers to develop and work to implement a timing standard.

The concept of FP4D argues that actors take up different *timing roles* in relation to a timing standard – either an extant one or one in the making – depending on their preferences about the outcomes the timing standard aims to create.[38] Driven by temporal dissonance, *timing entrepreneurs* see key foreign policy actions, events, or change dynamics as misaligned, hindering their foreign policy goals. In response, they seek out novel or innovative ways to time these processes into a more propitious alignment, working to develop and implement new timing standards. *Timing malcontemps*, on the other hand, set up resistance in reaction to a dominant or ascending timing standard, working to undermine its coordinating or synthesising capacity. Their political aims are to unravel an existing timing standard, or to preserve a preferred one against changes. Their efforts are primarily through resistance and subversion, rather than actively proposing a new timing standard. Finally, *timing apparatchiks* work as technicians within a given or ascendant timing standard, toiling to keep the timing gears oiled and meshed to create a smooth flow of time. They help to stitch together, or prevent the fraying of, an extant or proposed timing standard by creating procedures, reducing frictions, or otherwise facilitating its effectiveness. Each of these roles is political in nature, with actors pursuing their preferred foreign policy goals by developing, refining, or undermining a particular timing standard.

Hom and Beasley's examination of Brexit, the UK withdrawal from the European Union (EU) as a foreign policy timing initiative helps to illustrate these roles.[39] They argue that Brexit was led by timing entrepreneurs who had been frustrated with perceived constraints on UK autonomy and were emboldened by the outcome of the Brexit referendum. Seeking to implement Brexit as a new timing standard that would govern a fundamentally different relationship between the UK on the one hand and the EU and the rest of the world on the other, these actors met resistance by timing malcontemps who sought to slow down, subvert, or even reverse the Brexit withdrawal process. This struggle manifested through political wrangling over the initiation, pace, and duration of the withdrawal negotiations, as well as the details of the EU–UK future relationship post-withdrawal. Both sides were variously supported by timing apparatchiks who either worked to facilitate the proper legislative sequences required to implement Brexit smoothly and efficiently or showed how this would be technically unfeasible without more time for scrutiny and debate. In this way, timing entrepreneurs worked to reduce their perceived temporal dissonance between UK aspirations and EU constraints by developing a new timing standard governing UK foreign relations, timing malcontemps assiduously laboured to undermine or substantively subvert such a change, and timing apparatchiks toiled legislatively within the timing gears to facilitate each of these efforts.

We argue that timing problems and the temporal dissonance they generate centralise temporality in foreign and security policymaking, focusing actors on their agency in constructing, manipulating, and orienting themselves to time. Because actors are struggling with underlying timing relations, they will engage in actions and initiatives aimed at temporal features of the foreign policy problem and will make temporal rhetorical claims about time itself. *Temporal rhetoric*, according to FP4D, entails actors – who are experiencing temporal dissonance and taking up different temporal roles – speaking about time itself in specific ways. Because time (the noun) has

[37] Beasley and Hom, 'FP4D'.
[38] Hom and Beasley, 'Constructing time'. 'Malcon*temps*' is their temporal rendering of 'malcontents'.
[39] Hom and Beasley, 'Constructing time'.

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been derived from underlying timing (the verb) dynamics, references to clock- or calendar-time reveal actors' orientation to or preferences around the political aims associated with a timing standard. We expect that actors who feel a timing standard is working well see time as more objective and unproblematic, resulting in statements characterising time as being smooth, efficient, or 'great'. When timing is seen to slip, or unwelcome timing initiatives are under way, the language of foreign policymakers will tend to speak of time in more troubling ways, such as it being wasted, ticking, pressured, and running out. Such *timing indexicals* serve as markers for underlying timing concerns[40] but also as predictions about time rhetoric when policymakers are grappling with foreign policy timing problems.

We further extend FP4D by clarifying the temporal initiatives and tactics that will become prominent when actors are dealing with foreign policy timing problems. These *time tactics* entail delays, accelerations, setting deadlines, and other temporal manoeuvres designed to affect the time frame – such as the initiation, pace, sequence, or duration – of one or more of the change processes that are being timed together. Such time tactics can also involve directly working to undermine or sabotage the timing standard that is being proposed, or the efforts involved in its construction. This might entail challenging the timing standard through legal, moral, or practical arguments, or by actively complicating an opponent's ability to create or implement the timing standard itself. In essence, such time tactics seek to (mis)align the different change processes a timing standard is linking, or they seek to affect its ability to do so.

We examine these propositions in the Iranian case, which is particularly suited for our purposes in three ways. First, Iran is now nearly a nuclear threshold actor, and concerns over its nuclear programme are being contested around time – whether, and how quickly, it will cross the nuclear threshold. Negotiations themselves also have prominent temporal features, as they have been ongoing for over a decade, have been marked by a slow start, periodic delays, and reversals, and have now stalled. Thus prima facie the Iran case has significant time dynamics that suggest its deductive-ideographic value by potentially providing a cogent and theoretically informed account of multiple actors' temporal behaviours during and following the JCPOA negotiations.[41]

Second, the Iran case allows us to engage in a plausibility probe case study. Because of its prima facie temporal characteristics, it represents a good choice for this type of case analysis, demonstrating how the FP4D theoretical framework can be applied empirically using the Iran case as an illustration. A plausibility probe is also appropriate for extending the application of the FP4D framework, previously only examined in the UK's Brexit, into a security policy context.[42] This can better inform us about its scope conditions, applicability, and limitations. In particular, the Iran case can give us further insights into timing's relationship to nuclear technology, and its influence on crises in high-stakes security issues.

Finally, the Iran case is an important one in terms of real-world consequences associated with potential nuclear proliferation and can show the challenges policymakers faced in managing this type of proliferation problem.[43] The FP4D framework may be especially useful in this regard because its agent-centric focus, in contrast to more objective treatments of time, may offer insights particularly relevant to policymakers dealing with foreign policy timing problems. Our case study focuses on the development, contestation, and consequences of a particular timing standard – the JCPOA agreement – to better examine these types of foreign policymaking dynamics, while acknowledging that other timing standards will have been relevant to the US–Iranian

[40] Hom, *Problem of Time*.

[41] Jack S. Levy, 'Case studies: Types, designs, and logics of inference', *Conflict Management and Peace Science*, 25:1 (2008), pp. 1–18; Harry Eckstein, 'Case studies and theory in political science', in Fred I. Greenstein and Nelson W. Polsby (eds), *Handbook of Political Science*, vol. 7 (Reading, MA: Addison-Wesley, 1975), pp. 79–138.

[42] Hom and Beasley, 'Constructing time'.

[43] Colin H. Kahl and Kenneth N. Waltz, 'Iran and the bomb: Would a nuclear Iran make the Middle East more secure?', *Foreign Affairs*, 91 (2012), pp. 157–60 (p. 157); Farhad Rezaei, 'JCPOA collapse: Will proliferation follow?', *Middle East Policy*, 26:2 (2019), pp. 48–61.

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relationship and the broader issues around nuclear proliferation. We reflect on these in our conclusions.

Case study: Timing nuclear Iran

Our case study analyses key events, actions, and rhetoric during the P5 + 1 (five permanent UN Security Council members plus Germany) Iranian nuclear negotiations and their subsequent implementation. We focus primarily on leadership in the US and Iran, but also briefly discuss other important actors' involvement. We divide the case into three phases: negotiations following Rouhani's election in 2013 through the 2015 JCPOA agreement and early implementation; the Trump administration's efforts to challenge and then abandon the agreement and Iran's reactions to these efforts; and the initiatives to salvage the deal following the election first of Biden and then Raisi.

Phase I: Constructing a nuclear clock

Iran halted potential military aspects of its nuclear programme in 2003 following the political storm that erupted when the extent of its activities was exposed.[44] However, Iran continued what it refers to as its peaceful nuclear programme for civilian purposes, making significant advances. Over the next decade, while the United States opposed any enrichment activities on Iranian soil, the Iranian leadership insisted that it would never halt enrichment indefinitely. According to US intelligence, Iran possessed the scientific, technical, and industrial capacity to produce nuclear weapons if it chose to do so from 2007.[45] Early in the Bush administration, Iran was able to operate 164 centrifuges, but only about a decade later it had increased its capacity to 19,000. This gradually transformed the uranium enrichment time horizon, increasing temporal dissonance from the slippage between the sanction regime and Iranian nuclear advancements.

In this light, the Obama administration shifted US foreign policy from a strict strategy of ceaseless prevention toward one of temporal containment. Following his election in 2013, Hassan Rouhani was also eager to solidify his centrist political victory by linking his focus on Iran's nuclear programme to an easing of sanctions and fostering greater economic integration. Secret bilateral talks between Iran and the United States were then merged with the official negotiations process between Iran and the P5 + 1, resulting in intense negotiations. For both new leaders, then, the growing temporal dissonance between the sanctions regime and Iran's nuclear programme had become more pronounced, pushing them towards timing entrepreneur roles by negotiating toward a new timing standard, one that would reorient actors around a different temporal understanding of Iranian nuclear behaviours.

The goal of negotiations for the P5 + 1 was no longer to make building a bomb impossible but to put restrictions in place to lengthen the time Iran would need to produce enough weapons-grade uranium for a single nuclear bomb. But before time could be transformed from a problem to a solvent, a timepiece was required that could measure the pace of Iran's nuclear development. This timepiece became known as *breakout time* and would become 'the quantitative assessment' and be 'synonymous with assessing the risk posed by Iran's nuclear program'.[46] Breakout time assesses the time it would take to produce enough fissile material for a single nuclear weapon but is estimated rather than calculated; different experts using the same numbers can come up with different time frames.[47] In 2013, Iran's breakout time was estimated in calendar-time terms at about two to

[44]National Intelligence Council, 'Iran: Nuclear intentions and capabilities', *National Intelligence Estimate* (2007), p. 6.

[45]Ibid., p. 8.

[46]Kelsey Davenport and Julia Masterson, 'The limits of breakout estimates in assessing Iran's nuclear program', *Arms Control Association*, 12:6 (2020), available at: {https://www.armscontrol.org/issue-briefs/2020-08/limits-breakout-estimates-assessing-irans-nuclear-program}.

[47]Ali Vaez, 'Missing the point on Iran's nuclear breakout time', *Al Jazeera* (2 March 2015), available at: {http://america.aljazeera.com/articles/2015/3/2/five-misconceptions-about-iran-nuclear-talks.html}.

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three months.[48] The United States and its allies wanted to restrict Iran's nuclear programme to the point that the breakout time would be extended to at least one year, giving world powers time to respond. Although Iran initially resisted using the concept, by the end of 2014 Iran accepted that the United States would not agree to a breakout time of under one year.[49]

Estimating breakout time became a sticking point in negotiations. American nuclear experts' technical calculations of it were classified,[50] while Iranian negotiators came up with their own estimations. 'Much of what could clarify the choice of one approach over another was dependent on mathematics and science rather than politics',[51] complicating negotiations, and the unwillingness of the United States to declassify its nuclear estimates, combined with the variable technology of enrichment and centrifuges, left the development of a breakout timepiece with its hands tied. But like a stopwatch used to time two runners, it does not matter how well it keeps time against 'real time', only that it ticks at the same rate for them both, which this timepiece could not yet do.

To accomplish this, then director of Atomic Energy Organization of Iran Salehi and his counterpart US secretary of energy Ernest Moniz were included in the negotiations. Leading the technical negotiations from February 2015, their 'ability to find scientific compromises that met or sidestepped the political demands of Washington and Tehran was vital' in overcoming the deadlock in talks.[52] Speaking the same scientific language, they quickly developed 'a good rapport' according to Moniz.[53] Working like timing apparatchiks, the two scientists found ways to achieve the one-year breakout time, effectively greasing the wheels of an ascendant timing standard by allowing the construction of a plausible breakout timepiece that could measure, in familiar clock-time language, Iran's nuclear behaviours. Iran agreed to limit the number of its centrifuges, reduce its stockpile of low enriched uranium (LEU) by 98%, and to an enrichment cap of 3.67%.

Combined, these restrictions were adopted to increase the calendar-time it would take Iran to accumulate enough material for one bomb to more than a year. This paved the way for the two sides to agree upon the JCPOA timing standard to regulate the pace and sequencing of the Iranian nuclear programme and giving a means of assessing when linked international sanctions could be lessened, removed, reinstated, or intensified. Breakout time thus served to establish and define the important dynamics involved, orient actors to the meaning of time in the context of nuclear development, and give a means of controlling change dynamics into the future.

Both sides claimed success in temporal terms, with the United States and its allies describing the agreement as neutralising the Iranian nuclear capability for the time being and Iranians framing it as preserving their capability going forward.[54] And both presidents Obama and Rouhani grandly referred to the agreement in positive temporal terms, as an 'historic deal'.[55] For both sides, then, the timing was right, where Iranian nuclear activity ran neither too fast nor too slow. The JCPOA agreement also contained other important temporal elements, including clauses known as the sunset provisions, which stipulate when the various restrictions imposed on Iran's nuclear

[48]Davenport and Masterson, 'The limits of breakout estimates'.

[49]John F. Kerry, *Every Day Is Extra* (New York: Simon and Schuster, 2018), p. 506.

[50]Ibid., p. 506.

[51]Ibid.

[52]Richard Spencer and David Blair, 'MIT, a whiteboard and nuclear physics: How the Iran deal was wtruck', *The Telegraph* (4 April 2015), available at: {https://www.telegraph.co.uk/news/worldnews/middleeast/iran/11516061/MIT-a-whiteboard-and-nuclear-physics-how-the-Iran-deal-was-struck.html}.

[53]David E. Sanger, 'No. 2 negotiators in Iran talks argue physics behind politics', *New York Times* (29 March 2015), available at: {https://www.nytimes.com/2015/03/29/world/middleeast/no-2-negotiators-in-iran-talks-argue-physics-behind-politics.html}.

[54]David E. Sanger and Michael R. Gordon, 'Clearing hurdles to Iran nuclear deal with standoffs, shouts and compromise', *New York Times* (15 July 2015), available at: {https://www.nytimes.com/2015/07/16/world/middleeast/clearing-hurdles-to-iran-nuclear-deal-with-standoffs-shouts-and-compromise.html}.

[55]'The historic deal that will prevent Iran from acquiring a nuclear weapon', The White House Archives, (8 January 2024) available at: {https://obamawhitehouse.archives.gov/issues/foreign-policy/iran-deal}; 'Rouhani says nuclear deal "political victory" for Iran', *Aljazeera* (15 July 2015), available at: {aljazeera.com/news/2015/7/15/rouhani-says-nuclear-deal-political-victory-for-iran}.

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programme expire after 15 to 25 years, and other clauses provided for some military embargos on Iran to lapse after 5 to 8 years.[56] Significantly, these calendar-time milestones were not directly governed by the breakout time concept at the heart of the JCPOA timing standard. Nevertheless, Iran implemented its commitments by early 2016, while the United States, EU and United Nations suspended or terminated a vast array of nuclear-related sanctions.

Phase II: Malcontemps under Trump's watch

In the United States, opponents of the accord had already put much effort into derailing it. Working as timing malcontemps, the Republicans and the Israelis acted in concert,[57] with the Israeli lobby spending tens of millions of dollars to prevent the deal.[58] In the midst of negotiations, former Israeli prime minister Benjamin Netanyahu was invited by Republican leaders to give a speech at the US Congress in March 2015. Using grand and sweeping language suggesting his underlying timing concerns, Netanyahu indicated that he was on a 'historic mission' to prevent a 'very bad' deal that did not 'take away the Islamic Republic's ability to ultimately obtain nuclear weapons'.[59] Aiming squarely at its timing features, Netanyahu's efforts also targeted the agreement via the US foreign policymaking process that created it. Due to fierce congressional opposition, Obama had signed the nuclear deal as an executive agreement and political commitment rather than a treaty ratified by lawmakers, which denied it the temporal surety of a more enduring agreement and left it vulnerable to a new US president.[60] A week after Netanyahu's speech, in an effort to sabotage the deal, 47 Republican senators wrote an open letter to Iran's Supreme Leader Ali Khamenei, asserting it was temporally limited because 'the next president could revoke such an executive agreement with the stroke of a pen'.[61]

During the US presidential campaign in 2016, then-presidential candidate Donald Trump repeatedly slammed the accord, saying that it would be a top priority of his administration to dismantle it.[62] Despite broadly agreeing with the Obama administration's opposition to Iran having nuclear weapons capability, Trump indicated the problem was temporal, not 'necessarily that Iran is going to violate' the deal but 'that they can keep the terms and still get to the bomb by simply running out the clock'.[63] When paired with his grand claims that the JCPOA was 'the worst deal ever negotiated', and that it could lead to a 'nuclear holocaust',[64] his characterisation of time 'running out' suggest his underlying timing concerns.

In office, Trump maintained his hostility to the nuclear deal but delayed an immediate abandonment. He initially certified Iran's compliance twice under a law that required the White House to notify Congress of Iran's compliance every 90 days. The recurring three-month certification

[56]Kelsey Davenport, 'Hope for the Iran nuclear deal is not completely lost', *Atlantic Council* (7 January 2020), available at: {https://www.atlanticcouncil.org/blogs/iransource/hope-for-the-iran-nuclear-deal-is-not-completely-lost/}.

[57]Wendy Sherman, 'How we got the Iran deal: And why we'll miss it', *Foreign Affairs* (September/October 2018).

[58]Jennifer Steinhauer, 'Democrats hand victory to Obama on Iran nuclear deal', *New York Times* (10 September 2015), available at: {https://www.nytimes.com/2015/09/11/us/politics/iran-nuclear-deal-senate.html}.

[59]Krishnadev Calamur, 'In speech to Congress, Netanyahu blasts "a very bad deal" with Iran', *NPR* (3 March 2015), available at: {https://www.npr.org/sections/thetwo-way/2015/03/03/390250986/netanyahu-to-outline-iran-threats-in-much-anticipated-speech-to-congress}.

[60]Glen S. Krutz and Jeffrey S. Peake, *Treaty Politics and the Rise of Executive Agreements* (Ann Arbor: University of Michigan Press, 2011), p. 11.

[61]'Obama mocks Republican letter to Iran over nuclear talks', *BBC* (9 March 2015), available at: {https://www.bbc.com/news/world-us-canada-31796235}.

[62]Anthony Zurcher, 'Three reasons behind Trump ditching Iran deal', *BBC* (8 May 2018), available at: {https://www.bbc.co.uk/news/world-us-canada-43902372}.

[63]Donald J. Trump, 'Donald Trump's speech to AIPAC', *Time* (21 March 2016), available at: {https://time.com/4267058/donald-trump-aipac-speech-transcript/}.

[64]Yeganeh, Torbati, 'Trump election puts Iran nuclear deal on shaky ground', *Reuters* (19 November 2016), available at: {https://www.reuters.com/article/us-usa-election-trump-iran/trump-election-puts-iran-nuclear-deal-on-shaky-ground-idUSKBN13427E}.

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deadline had been a procedural time tactic with a distinctly political aim, giving Congress a way to make the Obama administration continually account for a deal many opposed.[65] Its effects lingered, affecting executive decision-making. Trump certified Iran's compliance, but reportedly with much reluctance at the urging of secretary of state Rex Tillerson and defense secretary Jim Mattis.[66] But as Tillerson stated, Trump found the sunset clauses of the deal unacceptable, as he thought one could almost 'set the countdown clock to when Iran can resume its nuclear weapons programs, its nuclear activities'.[67]

By October 2017, Trump refused to certify Iran's compliance despite the judgement of the International Atomic Energy Agency (IAEA) and US intelligence agencies that Iran was complying with the deal. Arguing there was a 'very real threat of Iran's nuclear breakout',[68] his concerns again landed squarely on time, threatening to leave the deal altogether if Congress did not make 'all restrictions on Iran's nuclear activity permanent'.[69] By passing the baton to Congress, Trump started a ticking clock of a 60-day window for Congress to reimpose sanctions, hoping to kill the deal without getting 'his hands dirty'[70] but also affording the possibility of a more permanent result.

The review period, however, expired with Congress choosing not to act, putting the deal back in Trump's hands. In January 2018, Trump upped the ante with another deadline, setting a 120-day ultimatum for Congress and Europe to meet his demands to put permanent restrictions on Iran's nuclear activities.[71] Waiving sanctions against Iran for a third and final time, Trump said that this was 'a last chance'.[72] But the E3 signatories Germany, France, and Britain saw the countdown differently. Oriented by the JCPOA agreement, they instead worked to preserve the deal by imposing additional non-nuclear-related sanctions technically lying outside the JCPOA timing standard.[73] Instead of capitulating, they acted as timing apparatchiks, tinkering at the margins with the sanctions side of the equation.[74] In this way, Trump's last-chance deadline did not resonate with their political preferences, and Tillerson noted that the E3 did not feel obliged to act on a timetable driven by the United States: 'we can't set timetables for others … they're sovereign governments'.[75]

Less than two weeks before the 12 May deadline set by Trump, and facing less internal resistance from his administration with a new, more hawkish cohort of advisers, Trump finally announced the US withdrawal from the deal on 8 May 2018. He claimed, 'the agreement was so poorly negotiated that even if Iran fully complies, the regime can still be on the verge of a nuclear breakout in just

[65]Larry Kaplow, 'Trump again keeps US in Iran nuclear deal – but threatens to get out later', *NPR* (12 January 2018), available at: {https://www.npr.org/sections/parallels/2018/01/12/577460807/trump-again-keeps-u-s-in-iran-nuclear-deal-but-threatens-to-get-out-later}.

[66]Mark Landler and David E. Sanger, 'Trump disavows nuclear deal, but doesn't scrap it', *New York Times* (13 October 2017), available at: {https://www.nytimes.com/2017/10/13/us/politics/trump-iran-nuclear-deal.html}.

[67]'Iran nuclear deal: US "sunset clause" concern remains – Tillerson', *BBC* (21 September 2017), available at: {https://www.bbc.com/news/world-middle-east-41344366}.

[68]Steve Holland and Yara Bayoumy, 'Trump strikes blow at Iran nuclear deal in major US policy shift', *Reuters* (13 October 2017), available at: {https://www.reuters.com/article/us-iran-nuclear-usa-idUSKBN1CI24I}.

[69]'Iran nuclear deal: Trump's speech in full', *BBC* (13 October 2017), available at: {https://www.bbc.co.uk/news/world-us-canada-41617488}.

[70]Anthony Zurcher, 'Trump hands Congress a hot potato', *BBC* (13 October 2017), available at: {https://www.bbc.com/news/world-us-canada-41613314}.

[71]'How Europe can save the Iran nuclear deal', *International Crisis Group* (2 May 2018), available at: {https://d2071andvip0wj.cloudfront.net/185-how-europe-can-save-the-iran-nuclear-deal.pdf}.

[72]'Trump to approve Iran nuclear deal for last time', *BBC* (12 January 2018), available at: {https://www.bbc.com/news/world-us-canada-42670577}.

[73]Robin Emmott and John Irish, 'Exclusive: European powers propose new Iran sanctions to meet Trump ultimatum', *Reuters* (16 March 2018), available at: {https://www.reuters.com/places/mexico/article/us-usa-trump-iran-eu-exclusive/exclusive-european-powers-propose-new-iran-sanctions-to-meet-trump-ultimatum-idUSKCN1GS2A7}.

[74]Guy Taylor, 'Congress ignores Trump's pleas for help, deadline to improve Iran nuclear deal', *Washington Times* (11 December 2017), available at: {https://www.washingtontimes.com/news/2017/dec/11/donald-trumps-iran-nuclear-deal-deadline-ignored-c/}.

[75]Rex W. Tillerson. 'Remarks en route to Paris, France', US Department of State, 22 January 2018, available at: {https://2017-2021-translations.state.gov/2018/01/22/remarks-en-route-to-paris-france/index.html}.

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a short period of time'.[76] Trump was supported by Netanyahu, who had revealed in a theatrical presentation 'incriminating' documents seized from a secret warehouse in Tehran,[77] but which did not contain any new information unknown to the international community.[78]

Supporters of the deal insisted that the JCPOA at least buys time, subjecting Iran to strong constraints on its nuclear activities for many years. As Obama wrote in a Facebook comment, 'even as some of the provisions in the JCPOA do become less strict with time, this won't happen until ten, fifteen, twenty, or twenty-five years into the deal, so there is little reason to put those restrictions at risk today'.[79] John Kerry also vehemently and loudly criticised Trump, arguing that he 'had taken a situation where there was no crisis, and created crisis'.[80] This crisis was born from escalating timing dynamics. Trump's delays in withdrawing from the deal, the back-and-forth deadlines with Congress, and the different timing roles taken up by the United States and the E3 all contributed to a sense that time had finally run out on containing Iran's nuclear programme. The United States subsequently reinstated all sanctions it had waived. The JCPOA's fate from then on became 'a three-way race against the clock':[81] a campaign of maximum pressure policy by the United States aiming to force Iran to quickly renegotiate a deal; Iran's strategic patience to wait out the Trump administration; and the E3's ongoing earnest but largely symbolic efforts to prevent the deal's derailment.

While Iran's Supreme Leader had previously claimed that 'the Islamic Republic will set fire to the deal' if then candidate Trump's threats to dismantle were enacted,[82] Iran was not so hasty when Trump finally did so. President Rouhani emphasised Iran's continued commitment to the deal: 'From now on, this is an agreement between Iran and five countries.'[83] While Khamenei was quick to publicly remind Rouhani's government that he had 'said from the first day: don't trust America',[84] there was no longer any reference to setting fire to the deal. Instead, emphasising the commitment problem revealed by Trump abandoning the deal, he urged Rouhani's administration to get guarantees from the European powers before agreeing to uphold the deal. The agreement had provided desperately needed economic relief to Iran,[85] and hoping to maintain those economic benefits Iran continued to fully implement its commitments under the JCPOA for the following year, keeping the scale and pace of its nuclear activities within the agreed framework.

[76]Ibid.

[77]David M. Halbfinger, David E. Sanger, and Ronan Bergman, 'Israel says secret files detail Iran's nuclear subterfuge', *New York Times* (30 April 2018), available at: {https://www.nytimes.com/2018/04/30/world/middleeast/israel-iran-nuclear-netanyahu.html}.

[78]Oliver Holmes and Julien Borger, 'Nuclear deal: Netanyahu accuses Iran of cheating on agreement', *The Guardian* (30 April 2018), available at: {https://www.theguardian.com/world/2018/apr/30/netanyahu-accuses-iran-cheating-nuclear-deal}.

[79]Barack H. Obama, 'There are few issues more important to the security of the United States than the potential spread of nuclear weapons', Facebook (8 May 2018), available at: {https://www.facebook.com/barackobama/posts/there-are-few-issues-more-important-to-the-security-of-the-united-states-than-th/10155854913976749/}.

[80]'John Kerry: [Trump] has taken a situation where there was no crisis, and created crisis', *MSNBC* (8 May 2018), available at: {https://www.msnbc.com/deadline-white-house/watch/john-kerry-trump-has-taken-a-situation-where-there-was-no-crisis-and-created-crisis-1228479555505}.

[81]'On thin ice: The Iran nuclear deal at three', *International Crisis Group* (16 January 2019), available at: {https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/iran/195-thin-ice-iran-nuclear-deal-three}.

[82]'Iran's Khamenei threatens to "set fire" to nuclear deal if West violates', *Reuters* (14 June 2016), available at: {https://www.reuters.com/article/us-iran-nuclear-khamenei-idUSKCN0Z02MA}.

[83]Saeed Kamali Dehghan and Daniel Boffey, 'Iran vows to stick with deal after "pesky" Trump's departure', *The Guardian* (8 May 2018), available at: {https://www.theguardian.com/us-news/2018/may/08/europe-denounces-trumps-us-withdrawal-from-iran-nuclear-deal?CMP=twt_gu&xid=17259,1500003,15700002,15700023,15700124,15700149,15700168,15700173,15700186,15700189,15700201}.

[84]'Iran warns Trump: "You've made a mistake" over nuclear deal', *BBC* (9 May 2018), available at: {https://www.bbc.co.uk/news/world-us-canada-44057306}.

[85]'Real GDP growth', *International Monetary Fund*, 2017, available at: {https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/IRN?year=2017}.

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While the EU took steps to maintain the economic benefits for Iran, including updating the European Investment Bank lending mandate to make Iran eligible for investments,[86] in practice firms could not be persuaded to undertake the financial risks of violating US sanctions. Here, we can see a limitation of the JCPOA timing standard, precisely because it could not time all the actors involved on both sides of the timing equation. While Iran clung to it as a valuable way to link its nuclear programme and its economic recovery, and the Europeans worked to maintain that linkage, the free market under pressure from the Trump administration failed to keep pace.

After waiting a year, the growing dissonance between intensifying sanctions and Iran's self-restraint proved too much, and Iran began to incrementally violate the deal's limits. Despite the Trump administration's maximum pressure policy and efforts to goad Iran into leaving the JCPOA, Iran used carefully calibrated time tactics to slowly decrease its breakout time.[87] It triggered a rolling ultimatum in May 2019, starting to reduce its compliance every 60 days. In the proceeding months, Iran increased its stockpile of LEU, raised enrichment levels, and lifted limits on testing more advance centrifuges. By November 2020, Iran had 12 times the amount of enriched uranium permitted under the JCPOA.[88] This reduced Iran's estimated breakout time from more than a year to three to four months.[89] Nevertheless, Iran kept uranium enrichment level at 4.5%, well below the 20% concentration to which it enriched prior to the agreement. Importantly, Iran also avoided breaching its commitment regarding the robust IAEA inspection regime.[90] According to the US State Department assessment in 2020, Iran did not engage in any activities relevant to nuclear weapons development.[91]

While the nuclear deal faltered in keeping the Iranian economy and its nuclear activities in time with one another, Islamic Republic officials nevertheless kept the timepiece ticking, gradually increasing timing pressure to return to negotiations by slowly increasing their pace of enrichment. This was not a dash to a bomb but a calculated pacing of its behaviour as a foreign policy tool to create urgency via the timing standard in place, putting the Europeans under increasing timing pressure to provide sanctions relief while it waited out the results of the presential elections in the United States. This growing temporal dissonance resulted in a substantial but controlled escalation of the crisis. Iran was showing that as the hour-hand of the sanctions moved forwards, the minute-hand of the nuclear timing clock could move backwards, towards a time when Iranian nuclear behaviour was untimed.

Along with elections around the corner that could hand the White House to Democrats, Iran's strategy of gradually violating of the deal pushed the Trump administration to quickly escalate the sanctions side of the timing equation. In August 2020, the United States introduced a United Nations (UN) resolution seeking to extend the arms embargo on Iran indefinitely, which was set to expire in October 2020 as the first sunset clause of the JCPOA. The resolution was however defeated. The United States then attempted to intensify sanctions by invoking the snap-back mechanism, which allows a participant state to initiate the restoration of six previous UN

[86]Cathleen D. Cimino-Isaacs, Kenneth Katzman, and Derek E. Mix, 'Iran: Efforts to preserve economic benefits of the nuclear deal', Congressional Research Service (26 February 2019), available at: {https://fas.org/sgp/crs/nuke/IF10916.pdf}.

[87]Davenport and Masterson, 'The limits of breakout estimates.'

[88]'Iran's enriched uranium stockpile 12 times limit, says IAEA', *BBC* (12 November 2020), available at: {https://www.bbc.com/news/world-middle-east-54912402}.

[89]'Middle East roundup: IAEA report says Iran's uranium stockpile 12 times JCPOA limit', *NIAC* (12 November 2020), available at: {https://www.niacouncil.org/news/middle-east-roundup-iaea-report-says-irans-uranium-stockpile-12-times-jcpoa-limit/?locale=en}.

[90]'The Iran nuclear deal at four: A requiem?', *International Crisis Group* (16 January 2020), available at: {https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/iran/210-iran-nuclear-deal-four-requiem}.

[91]'2020 adherence to and compliance with arms control, nonproliferation, and disarmament agreements and commitments (compliance report)', US Department of State, June 2020, available at: {https://2017-2021.state.gov/2020-adherence-to-and-compliance-with-arms-control-nonproliferation-and-disarmament-agreements-and-commitments-compliance-report-2/index.html}.

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Security Council resolutions unless within 30 days a new resolution is passed. The United States insisted that it legally remained a participant state in the accord, but only for the purposes of invoking the snapback.[92] Thirty days after the snapback was evoked, US officials announced that all UN sanctions on Iran had been automatically reinstated and the deal was now 'history'.[93]

But the international community broadly rejected the US invocation of the snapback mechanism, with 13 of the 15 UN Security Council members saying that Washington's move was void.[94] The US behaviours as a timing malcontemp effectively left it excluded from a key decision-making body with important timing powers. Germany, France, and the UK issued a joint statement, noting that 'the US ceased to be a participant to the JCPOA following their withdrawal from the deal … the purported notification … is incapable of having legal effect'.[95] Procedurally outmanoeuvred by the JCPOA timing apparatchiks who managed to keep the timepiece ticking, the United States could not prevent the arms embargo on Iran expiring in October 2020. Only two weeks later, Donald Trump was defeated by Joe Biden in the US presidential election.

Phase III: Rewinding the nuclear clock

There were high hopes for the revival of the JCPOA following Biden's election in November 2020. During his campaign, Biden called Trump's decision to abandon the deal 'reckless' saying he will 'offer Tehran a credible path back to diplomacy'.[96] With Rouhani's legacy tied to the nuclear accord and Iranian presidential elections set to take place in summer 2021, many expected an agreement would be finalised before a new president in Iran took over.[97] However, despite the apparent preference of both administrations to restore the JCPOA status quo ante, time tactics designed to deadlock or delay a return to negotiations successfully prevented this before Rouhani left office.

Importantly, in December 2020 new legislations were passed by the hardliners in Iran's parliament. Until this point, Iran's Supreme National Security Council (SNSC) – headed by President Rouhani – was the main nuclear decision-making body, with final decisions approved by the Supreme Leader. The Iranian parliament played a minor role, if any, in Iran's nuclear decision-making. But this changed in the wake of the assassination of top Iranian nuclear scientist Mohsen Fakhrizadeh by Israel in November 2020. Although Fakhrizadeh was regarded by intelligence services as the mastermind behind Iran's alleged past covert nuclear weapons programme, his killing was not believed to hinder Iran's nuclear advances. Rather, it was believed to have been carried out just weeks before Biden's inauguration to provoke Iran and complicate the diplomacy for the new US administration – a time tactic by malcontemp Israel targeting any return to (re)negotiating the JCPOA timing standard.[98]

It worked. In the wake of Fakhrizadeh's killing, decision rules and procedures regarding who makes nuclear policy in Iran underwent a change, both slowing the process of returning to

[92]David Welna, 'Pompeo tries starting "snapback" clock to restore sanctions against Iran by UN', *NPR* (20 August 2020), available at: {https://www.npr.org/2020/08/20/904475552/pompeo-tries-starting-snapback-clock-to-restore-sanctions-against-iran-by-u-n}.

[93]'Pompeo citing Iran's growing uranium stockpile tells other nations to "wake up"', *Iran International* (9 September 2020), available at: {https://iranintl.com/en/iran-in-brief/pompeo-citing-irans-growing-uranium-stockpile-tells-other-nations-wake}.

[94]'US against the world over Iran "snapback" sanctions', *Al Jazeera* (19 September 2020), available at: {https://www.aljazeera.com/economy/2020/9/19/us-against-the-world-over-iran-snapback-sanctions}.

[95]'On the US attempt to initiate the so-called snapback mechanism 30 days ago, the foreign ministers of Germany, France and the United Kingdom declared today (20.09.)', *Federal Foreign Office* (20 September 2020), available at: {https://www.auswaertiges-amt.de/en/newsroom/news/-/2386144}.

[96]Joe Biden, 'Joe Biden: There's a smarter way to be tough on Iran', *CNN* (13 September 2020), available at: {https://edition.cnn.com/2020/09/13/opinions/smarter-way-to-be-tough-on-iran-joe-biden/index.html}.

[97]Kali Robinson, 'Iran's presidential election: What to know', *Council on Foreign Relations* (16 June 2020), available at: {https://www.cfr.org/in-brief/irans-presidential-election-what-know}.

[98]'Killing Of Iranian nuclear scientist risks conflict, complicates diplomacy for Biden', *RFE/RL* (28 November 2020), available at: {https://www.rferl.org/a/killing-of-iranian-nuclear-scientist-risks-conflict-complicates-diplomacy-for-incoming-biden-administration/30973267.html}.

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negotiations while accelerating the pace of Iranian nuclear development. The December bill passed by the Iranian parliament called on the government to instal cascades of advanced centrifuges, increase uranium enrichment to 20% immediately, and to stop allowing IAEA inspections beyond the Safeguards Agreement if the Europeans did not lift sanctions on the oil and banking sectors by February 2021.[99]

With the hardliner malcontemps forcing the Rouhani administration to speed up enrichment activities, the government resisted these time tactics by delaying the full implementation of the bill while negotiations continued. Rouhani said that the bill was detrimental to the diplomatic process aimed at reviving the deal,[100] while Salehi also rejected the bill. Iran officially stopped the implementation of the Additional Protocol in February 2021 as required by the bill, but Zarif worked to redefine the meaning of this act along temporal lines, stating in an interview, 'this is not a deadline for the world. This is not an ultimatum. This is an internal domestic issue between the parliament and the government.'[101] To offset the effects of the bill, the Iranian government reached a temporary agreement with the IAEA in February to store video records of cameras monitoring its nuclear sites, promising to deliver those to the agency once sanctions were lifted. Thereby, the Rouhani team through its ability to offset the time tactics of the hardliners was able to buy some time and prevent a full-blown escalation of the situation while it raced towards reaching an agreement in the remaining months of the administration.

The Iranian administration continued to stress the importance of restoring the accord quickly. Zarif spoke of time in troubled terms, suggesting in an interview with CNN that the clock was ticking and that the US had limited time to rejoin the agreement.[102] Also addressing his domestic audience, Rouhani accused opponents in sweeping temporal language of obstructing the lifting of sanctions due to pre-election politics, saying that even a 'one hour delay' was a betrayal of the Iranian nation and history.[103] This came amid not only Rouhani's hardliner opponents in the parliament attempting to obstruct an agreement, but also Iran's Supreme Leader, less troubled by the temporal setback, making it publicly known in several speeches that Iran was 'in no rush' to revive the JCPOA.[104]

Talks resumed in April of 2021, with significant progress made on 'technical issues' by June. The restoration of the accord was now pending the 'political decision' of the governments.[105] Yet the decision in Iran fell against finalising the agreement, with an SNSC committee finding it to be incompatible with the parliament's nuclear bill.[106] The negotiations were paused until after the inauguration of the newly elected Ebrahim Raisi. The broader nuclear strategy of the Iranian regime did not undergo a major change. The final decision-maker, Ayatollah Khamenei, has remained a

[99]'Iranian parliament bill on nuclear program: Full text in English', *NIAC* (3 December 2020), available at: {https://www.niacouncil.org/publications/iranian-parliament-bill-on-nuclear-program-full-text-in-english/?locale=en}.

[100]Hira Humayun, Ramin Mostaghim, and Jennifer Deaton, 'Iran's parliament passes bill threatening to boost uranium enrichment and suspend inspectors', *CNN* (3 December 2020), available at: {https://edition.cnn.com/2020/12/03/middleeast/iran-uranium-enrichment-intl/index.html}.

[101]'Iran and IAEA reach "temporary" agreement to maintain nuclear surveillance access', *Euronews* (22 February 2021), available at: {https://www.euronews.com/2021/02/21/un-nuclear-chief-in-iran-ahead-of-sanctions-deadline}.

[102]Christiane Amanpour and Emmet Lyons, 'Iran is ready for a new relationship with the US, but the clock is ticking, says Foreign Minister Javad Zarif', *CNN* (2 February 2021), available at: {https://edition.cnn.com/2021/02/01/world/iran-javad-zarif-amanpour-interview-nuclear-deal-intl/index.html}.

[103]'Rouhani 'Sang-andazi dar Rafe Tahrim ra Mortabet ba Entekhabat 1400 va a Khiyanat beh Mardom Khand', *BBC Persian* (17 March 2021), available at: {https://www.bbc.com/persian/56425633}.

[104]'Khamenei says Iran in "no rush" to see U.S. rejoin 2015 nuclear deal', *RFE/RL* (8 January 2021), available at: {https://www.rferl.org/a/iran-khamenei-no-rush-to-rejoin-nuclear-deal/31038784.html}.

[105]Philipp Jenne and Kirstin Grieshaber, 'Diplomats: Progress made in Vienna at Iran nuclear talks', *AP* (20 June 2021), available at: {https://apnews.com/article/donald-trump-joe-biden-vienna-middle-east-iran-b6506eb091550af63b2097c3900bb4bf}.

[106]'Sokhangooye Dolat-e Iran Miguyad Shoraye Amniyate Meli, Tafahom-e Avaliye Rafe Tahrimhaa ra Rad Kard', *Radio Farda*, 20 July 2021, available at: {https://www.radiofarda.com/a/31368021.html}.

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constant in Iranian politics, and he has publicly backed efforts to lift the sanctions;[107] Raisi had also signalled during his campaign that he supported negotiations to revive the deal, and his administration resumed nuclear talks at the end of November 2021. But Biden's failure to prioritise a quick return to the deal meant that negotiations were subsequently conducted with a hardliner Iranian negotiating team, and while the nuclear issue was on top of the Rouhani administration's agenda, the new Iranian government had set different priorities, focusing on strengthening economic ties with regional neighbours, as well as with Russia and China.

It took four months for the new administration to resume the talks, and progress was slow. Western officials warned that negotiations could not continue indefinitely, suggesting[108] that 'time was running out' for the revival of the JCPOA.[109] But the Iranian leadership likely considered the passage of time to be to its advantage, allowing it to further develop its nuclear programme to use as leverage in negotiations.[110] Despite renewed progress in indirect talks by mid-2023 and the Biden administration's reported aim to reach an informal unwritten agreement with Iran to ease tensions,[111] the onset of the Israel–Hamas war in October 2023 has further complicated the situation. The impact of the recent wider geopolitical developments on Iran nuclear negotiations remains to be seen.

Conclusions: Timing international nuclear security

While the ticking of clock-time seems objective and persistent, FP4D showed how time can be created and disrupted and is not just an atheoretical auxiliary feature but an integral part of the Iranian nuclear security story. The JCPOA's rise and seeming demise and the faltering twists along the way were steered neither by significant shifts in preferences nor by the persistent ticking of an objective timeline, but instead by actors first building a nuclear timepiece and then throttling up and slowing down their pace, conjuring and defying deadlines, and employing a host of time tactics and timing manoeuvres aimed at stitching together or tearing apart the fabric of time woven by the JCPOA agreement. While clocks or calendars can give us a sense of an objective arc of the case *over time*, FP4D goes further by demonstrating actors' orientations to time, their temporal motivations, their use of various time tactics, and providing a theoretically informed account that shows how the evolution of the Iran nuclear issue did not just unfold over time but was also constructed and driven by it.

When key actors saw a timing problem – the misalignment of different change processes undermining their foreign policy goals – they became motivated by temporal dissonance to take up different timing roles. Both Obama and Rouhani adopted timing entrepreneur roles as they actively struggled to better link economic sanctions and Iranian nuclear behaviours. Timing apparatchiks assisted with this process, working to create the concept of breakout time which smoothed the way toward a new timing standard. Troubled by this initiative, actors with different foreign policy

[107]Erin Cunningham, 'Iran's Rouhani says "no doubt" Biden will rejoin nuclear deal, lift sanctions', *Washington Post* (17 December 2020), available at: {https://www.washingtonpost.com/world/middle_east/iran-sanctions-biden-nuclear-deal/2020/12/17/ef5fbd62-4040-11eb-b58b-1623f6267960_story.html}.

[108]'Blinken says nuclear talks with Iran "cannot go on indefinitely"', *Al Jazeera* (29 July 2021), available at: {https://www.aljazeera.com/news/2021/7/29/blinken-says-nuclear-talks-with-iran-cannot-go-on-indefinitely}.

[109]'Blinken, European allies say "time is running out" in Iran nuclear talks', *RFE/RL* (20 January 2022), available at: {https://www.rferl.org/a/iran-nuclear-talks-blinken-time/31663624.html}.

[110]Saheb Sadeghi, 'The view from Iran: What the Raisi administration wants in the nuclear talks', *Foreign Policy* (7 October 2021), available at: {https://foreignpolicy.com/2021/10/07/iran-deal-talks-jcpoa-vienna-nuclear-negotiations-raisi/}; Stephani Lichenstein, 'Iran plays for time as pessimism grows over nuclear talks', *Politico* (1 October 2021), available at: {https://www.politico.eu/article/iran-plays-for-time-pessimism-nuclear-talks/}; Kelsey Davenport, 'Iran's nuclear program is advancing. So too should negotiations', *Atlantic Council* (2 March 2023), available at: {https://www.atlanticcouncil.org/blogs/iransource/irans-nuclear-program-is-advancing-so-too-should-negotiations/}.

[111]Michael Crowley, Farnaz Fassihi, and Ronen Bergman, 'Hoping to avert nuclear crisis, U.S. seeks informal agreement with Iran', *New York Times* (24 June 2023), available at: {https://www.nytimes.com/2023/06/14/us/politics/biden-iran-nuclear-program.html}.

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goals took up timing malcontemps roles, orienting themselves to the new timing standard in ways designed to prevent, sabotage, or otherwise upend it.

We have shown how the timing standard and the temporal roles actors adopted resulted in policymakers talking about time itself in positive or negative ways, such as hailing the 'historic' agreement or decrying the 'ticking clock' it set in place. It also focused their foreign policy on the use of time tactics. These involved targeting the timing mechanism itself and efforts to (re)negotiate it, such as the US congress denying the agreement more durable treaty status, Trump working to make the JCPOA sunset provisions permanent, and Israel's assassination of Fakhrizadeh disrupting a return to negotiations. Time tactics also involved altering the pace, sequence, or duration of one or more of the change processes the timing standard linked, such as Trump creating crisis by reimposing economic sanctions and then the E3 working to alter them, Rouhani using timing pressure by gradually decreasing breakout time, the Iranian parliament passing a bill to accelerate uranium enrichment activities, and Rouhani buying time via IAEA monitoring concessions to avoid crisis and keep the deal alive.

A prominent time tactic in the case was the use of deadlines and ultimatums aimed either at subverting the timing standard or pressuring a return to it, like Trump's 120-day deadline for abandoning the deal or Iran's 60-day rolling ultimatum linked to its enrichment activities. While such deadlines involved clock- or calendar-time language, FP4D views them as efforts to put pressure on actors to join or abandon a timing standard, and missing or ignoring them can signal an actor's support or opposition to that standard regulating events. Because clock-time is deeply psychologically embedded as an objective and powerful force, actors often use it as a means of both expressing and pushing for their own preferences, but it is the context of a contested timing standard that imbues such clock-time claims and actions with particular meaning. Put differently, clock-time itself does not unfold things in one way or another, but it can become a powerful symbol when actors use it in their timing efforts to do so.

Timing problems motivated decision-makers to dip into the fourth dimension to find timing solutions, and FP4D showed how this was fraught with particular types of challenges. While the JCPOA agreement did establish breakout time and link sanctions to Iran's technical refinement processes, it faltered on two fronts. First, key actors relevant to the imposition or removal of sanctions were not incorporated into the timing standard. Once the United States abandoned the agreement, international sanctions relief could not keep up in the face of US pressure, and the larger international marketplace's behaviour was unbound by the timing standard of the JCPOA agreement. Second, its sunset provisions essentially abandoned timing to traditional calendar-time by setting specific *years* when key restraints would expire rather than fixing them to some other set of changes. That is, the timing standard did not include other key features of the Iranian nuclear programme, leaving them effectively untimed and vulnerable to temporal malcontemps.

Both these problems seem to have sprung from policymakers and negotiators focusing too closely on the technological solution of measuring breakout time. Because making a nuclear weapon involves different complex steps and stages, it times the behaviours of policymakers attempting to build one – a sort of *timing bomb*. This acted to shape the concerns of policymakers during negotiations and prompted the creation of breakout time, but it also narrowed the scope of the agreement, relegating subsequent steps to calendar-time 'sunset provisions' and neglecting to fully incorporate key actors capable of regulating sanctions. While technology can indeed affect time and timing,[112] timing theory reminds us that technology alone, like a mechanical clock, is not itself time.[113] Rather time is created through the *intentional* linking of technological changes to other change dynamics, and often requires significant ongoing interventions.

Understanding these types of foreign policy challenges as ongoing timing problems, rather than as the durability of actors' commitments *over time*, shifts our focus from future *reneging* and

[112]See Stevens, *Cyber Security and the Politics of Time*; Stevens, 'Governing the time of the world'; Kevin K. Birth, *Objects of Time: How Things Shape Temporality* (New York: Palgrave Macmillan, 2012).

[113]Hom, *The Problem of Time*.

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towards future *slippage* between factors that may seem effectively aligned in the present.[114] While both involve potential preference and capability changes that complicate negotiating an agreement, FP4D conceptualises these as intrinsic within a given timing standard and its particular vulnerabilities, flexibilities, and capacities to be retimed as needed. Viewing commitment problems as 'now versus later' problems that might arise from different actors *over time* objectifies them, makes them seem linear, and sets them outside any theoretical conception of how time is constructed. Because the so-called arrow of time does not flow but must instead be continuously monitored and frequently reconstructed, timing standards must both make and keep time, not just travel through it. Put differently, the 'future' of commitment problems always exists in the present timing standards being constructed, refined, and contested by policymakers and negotiators. Understanding time as timing might even help them build clocks more capable of first making it and then keeping to it.

Establishing a working timing standard is a political act. The irregular rhythms of political life are more readily synchronised flexibly, and an effective timing standard must first visibly if roughly discipline relevant actors together, and only then can it hope to gradually fall into a more passive mode regularising cooperation – much as Coordinated Universal Time does now after its contentious inception. From this view, we might see some of the challenges, and indeed crises, arising around nuclear diplomacy as stemming from the slippage of larger timing standards aimed at regulating nuclear proliferation. While the non-proliferation treaty (NPT) regime and its attendant norms may be resilient,[115] the timing standards it entails and enables can nevertheless become unwound, as with Trump 'creating crisis' by abandoning the nuclear deal with Iran. While crises are often defined as situations where short clock-time pressures agents, FP4D sees crises as arising from disruptions to timing. This gives us a different view of such security dynamics by focusing on the stable surety of enduring well-timed relations. Whether or not cooperation around a security issue endures or devolves into crisis depends mightily on actors' acceptance and maintenance of timing standards that are keeping secure relations in order. In contrast to the traditional view in International Relations that 'time is neutral and possesses no independent explanatory power on its own',[116] time itself may be the very source of insecurity.

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[ACLED has no country affiliation, and is a fully remote international NGO, although it is registered in the United States.]

[114]For another nuclear proliferation case involving technology to address a commitment problem, see Christopher Lawrence, 'Normalization by other means: Technological infrastructure and political commitment in the North Korean nuclear crisis', *International Security*, 45:1 (2020), pp. 9–50 (p. 11).

[115]Jeffrey S. Lantis and Carmen Wunderlich, 'Resiliency dynamics of norm clusters: Norm contestation and international cooperation', *Review of International Studies*, 44:3 (2018), pp. 570–93.

[116]McIntosh, 'Theory across time', p. 470.

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