

# Complex Adaptive Adversary: Understanding Iran's Resilience

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## **Key Points**

- Iran has endured more than four decades of sustained pressure from the U.S. and Israel. Nevertheless, Iran remains politically and militarily cohesive.
- Iran's endurance derives from three intertwined components:
  1. Iran's population.
  2. Iran's security apparatus.
  3. Iran's alliances.
- The population, security structure, and alliances form a self-stabilizing system in which each external shock generates new adaptive capacity. The result is a system resistant to collapse and difficult to coerce through attrition alone.
- A campaign against Iran must be tied to a clear political end state. Iran as a complex adaptive adversary may absorb punishment long enough to outlast U.S.'s political cycle.

The decision point that shapes conflict termination will emerge from within Iran's adaptive system, not from external pressure.

## **Introduction**

The protracted confrontation between the Islamic Republic of Iran and its adversaries has outlasted multiple U.S. administrations and shifts in regional strategy. Despite significant kinetic and economic pressure, Iran's political system continues to function. Moreover, Iran's apparatus and leadership (political and military) is still functioning although it is experiencing significant damage as result of the ongoing U.S.-Israeli military operation (Epic Fury and Roaring Lion).<sup>2</sup>

Traditional analytic frameworks linking cause and effect or that treat coercion as a linear function of cost and pressure cannot fully explain this continuity.<sup>3</sup> Iran's leadership construct has the properties of a complex adaptive system, a network that evolves under stress rather than collapses. Within such systems, observed outcomes often mislead and may reflect adaptation rather than system disintegration.

This paper argues that Iran should be understood as a complex adaptive system rather than merely as a hierarchical authoritarian state. Its resilience rests on three components:

1. A population conditioned by historical memory, culture, identity, (economic) hardship, and political repression.
2. A distributed security apparatus designed to preserve core functions through redundancy, decentralization, and adaptation under attack.
3. Pragmatic alliances that create pathways for consistency, power projection, and adaptive approaches for changing conditions.

Together, these components create a “state-society-alliance system” that can withstand prolonged pressure while preserving internal stability, making it difficult for external actors to dictate terms.

### **Complex Adaptive Systems and Iran’s Resilience**

Complex systems theory emphasizes that resilience emerges from (spontaneous) self-organization, networked interdependence, feedback, and adaptability. Systems survive by redistributing functions after disturbance and learning from disruption.<sup>4</sup> A classic example of a complex adaptive system is that of an ant colony.<sup>5</sup>

In military terms, a complex adaptive system survives attrition through redundancy and decentralized function, adapting faster than external actors can degrade them, and treats disruption as feedback that sharpens systemic agility.

Iran’s development since 1979 embodies these characteristics: It has operated under recurrent sanctions, internal unrest, assassinations, cyber disruption, and periodic direct military confrontation. These pressures have generated institutional learning, economic adaptation, layered coercive control, and a political culture where survival under duress is normalized. In effect, Iran somehow “acquired the ability to bring order and chaos into a special kind of balance. This balance point—often called the edge of chaos—is where the components of a system never quite lock into place, and yet never quite dissolve into turbulence, either.”<sup>6</sup>

### **The First Component: The Iranian Population**

The first component of Iranian resilience lies within society itself. Iran’s population has endured decades of sanctions, isolation, corruption, suppression by Iran’s regime, and conflict. This has resulted in a population accustomed to operating under conditions of constraint. Rather than producing systemic fragmentation, these pressures have often reinforced narratives of resistance and national sovereignty. Over time, they have also contributed to the development of a social character marked by endurance, pragmatism, and an ability to continue operating under abnormal and restrictive conditions.

Several dynamics contribute to this social resilience:

- **Historical Memory:** invasions by external actors throughout history, and perceived foreign threats strengthened national identity, culture, and domestic solidarity, even among parts of the population critical of the government.
- **Society under Strain:** Persistent surveillance, political constraint, and economic strain have shaped the population. Inflation, sanctions, and declining purchasing power deepen daily hardships, while the regime’s coercive presence limits open dissent and narrows public space.

### ***Example: Historical Invasions***

Iran’s contemporary resilience is rooted in a long civilizational history shaped by conquest, resistance, and cultural continuity. Iran has been invaded by Greeks, Arabs, Mongols, and others, nevertheless each wave of occupation was ultimately absorbed into a distinctly Persian political and cultural framework rather than erasing it. Across centuries, Persian language and administrative traditions reasserted themselves, and a recognizable Iranian identity persisted despite changes in regime and external domination.<sup>7</sup>

In the modern era, the Iran-Iraq War (1980-1988) reinforced this historical pattern. Iraq’s invasion of Iran did not break the state or society. Moreover, the conflict strengthened narratives of national endurance, sacrifice, and resistance that remain central to Iran’s (political) identity and (security) culture, today.

***Example: Character of the Population Under Prolonged Pressure:***

Decades of war, sanctions, political repression, and economic instability have fostered a population with a relatively high tolerance for hardship, uncertainty, and disruption. The resulting social character is defined by learned endurance, improvisation, and adaptive survival under constraint.

**The Second Component: Iran's Security Apparatus**

The second component of resilience lies within Iran's security architecture. Over four decades, Iran has developed a multilayered defense system designed specifically to operate under conditions of asymmetric conflict with technologically superior adversaries. Iran's security institutions, reinforced by ideology, are embedded in a revolutionary Shi'a framework that prizes sacrifice, endurance, and martyrdom in defense of the state and the revolution. The tolerance for attrition helps sustain cohesion.

During periods of popular unrest, the state's security apparatus often extends its response beyond physical suppression, employing psychological manipulation to demobilize protesters and deter further public participation.

Core characteristics of this component are:

- **Decentralized operational networks:** distributed and decentralized command structures that reduce vulnerability to leadership decapitation, and targeted strikes.
- **Institutional redundancy:** overlapping roles among the regular armed forces, the IRGC, and associated security institutions.
- **Continuous adaptation:** military doctrine and force structure have evolved in response to past attacks, including cyber operations, targeted assassinations, and limited military strikes. Iran's informal markets, local production networks, and sanction evasion mechanisms allowed economic activity to continue despite external restrictions.
- **Feedback and Narrative:** Iran's security institutions defend the state against external threats. Moreover, they also shape and regulate domestic society by managing dissent, channeling social behavior, and reinforcing narratives of resistance that align with regime priorities, while the (Shi'a) belief structure preserves motivation, legitimacy, and continuity of purpose.

***Example: The Architecture of Security***

Iran's "mosaic defense system" is intentionally constructed to survive attrition. Parallel forces (regular army, IRGC, and Basij) and intelligence agencies, create institutional redundancy. Distributed command and regional basing reduce the impact of leadership decapitation or localized strikes.<sup>8</sup> Doctrinal adaptation and incremental modernization in areas such as missiles, drones, and cyber capabilities, provided Iran asymmetric capabilities.

***Example: Cyber and Infrastructure Attacks***

From Stuxnet's targeting of nuclear centrifuges to subsequent cyber and infrastructure attacks, Iran has faced repeated efforts to degrade critical systems. These operations inflicted damage but also accelerated investment in indigenous cyber capabilities and defensive measures, leading to a more experienced and hardened cyber apparatus over time.<sup>9</sup>

***Example: U.S. "Maximum Pressure" Campaign (2018–2020)***

The reimposition of comprehensive U.S. sanctions from 2018 onward sharply reduced Iran's oil exports and

access to the international financial system.<sup>10</sup> Nevertheless, Iran partially compensated through clandestine oil shipments, regional trade, and domestic production shifts, forcing the economy to equilibrate at a lower but sustainable level.

***Example: Nationwide Protests***

Facing regularly widespread demonstrations, Iran’s security institutions combined coercive repression (mass arrests, use of live ammunition, and sweeping curfews) with tight control of information through internet and mobile shutdowns.<sup>11</sup> By publicly framing the unrest as a foreign-backed plot, they simultaneously delegitimized protesters and reinforced narratives of external threat, using the crisis both to suppress dissent and to consolidate a defensive, siege-mentality form of social cohesion.

***Example: Resistance, Jihad, and Martyrdom***

Iran’s “efforts to cultivate a culture of resistance, jihad, and martyrdom built on the moral and spiritual values of the Islamic Revolution, are not only central to its efforts to insulate the Islamic Revolution against subversive foreign cultural influences but are central to Iran’s efforts to project influence and confront its enemies.”<sup>12</sup>

Iran’s resilience is strengthened by the extent to which ideology is fused with the security apparatus. Losses among senior leaders are reinterpreted as justification for continued resistance and retaliation. Nevertheless, a key principle is “survival over ideology.” This allows pragmatic elements of the regime to justify setting aside ideological goals to ensure the state's preservation.<sup>13</sup>

**The Third Component: Pragmatic Alliances**

The third component of resilience is a network of pragmatic relationships that provide Iran with political backing, economic relief, military technology, and strategic depth. Partnerships with Russia and China, as well as linkages with regional actors, help Iran mitigate the impact of sanctions and external pressure. These partnerships remain fluid, driven by shifting interests and changing geopolitical realities, and provide Iran:

- **Pragmatic pathways:** By cultivating strategic relationships with both regional and major powers, Iran has established practical military and economic channels that enhance its relevance and utility within the international system. Although these partnerships are largely transactional, they enable Iran to secure strategic and material benefits while reinforcing its position as an influential and indispensable actor.
- **Decentralized networks:** Through years of investment in proxy organizations, Iran has established a “Shia Crescent” across the region. This structure enables Iran to extend its influence beyond its borders, enhance its power projection capabilities, and achieve greater strategic depth.

***Example: China and Russia Support***

The deepening of Iran–Russia cooperation during the Ukraine conflict exemplifies pragmatic exchange. Iran supplied Russia with combat drones, while receiving access to advanced air defense technology, upgraded drones, and intelligence sharing.<sup>14</sup>

The 25-year Iran–China Cooperation Agreement has provided Iran with investment commitments and a stable oil export outlet insulated from U.S. sanctions.<sup>15</sup> By connecting to China’s Belt and Road Initiative (BRI), Iran repositions itself within a parallel economic architecture.

***Example: Regional (Proxy) Network***

Iran exercises significant influence over the political structures of Lebanon and Iraq, primarily through a network of allied political parties and armed militias. Iran's ties with Hezbollah, the Houthis, and various other groups represent decentralized power projection. These relationships form a networked ecosystem of allied actors capable of (autonomous) adaptation.

### **Conclusion**

Iran's resilience is rooted in a combination of ideological conviction and the drive for existential survival. This resilience reflects the behavior of a complex adaptive system in which a conditioned population, a distributed security apparatus, and adaptive networks reinforce one another under sustained pressure. By converting continuous external threats into mechanisms of feedback and institutional learning, Iran has embedded endurance in its strategy.

Because of this adaptive structure, the collapse of such a system cannot be engineered externally without the occurrence of internal systemic failure. While military strikes may degrade certain capabilities, they often provoke organizational innovation and adaptive reform within the Iranian system. For example, kinetic military action from the air alone will not force regime change, compel Iran to give up its nuclear material, or cause it to capitulate. Such actions may even be counter-effective, potentially causing a "rally around the flag" effect that strengthens the regime. Consequently, long-term strategic competition with Iran will likely outlast U.S. political cycles.

The end of the conflict will depend on the point at which Iran's adaptive system judges continued resistance to be strategically unnecessary, and it needs to "drink the poisoned chalice,"<sup>16</sup> or on the point the U.S. adopts a "substitute for victory."<sup>17</sup>

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<sup>2</sup> Louise Nordstrom, “Not a One-Person Regime: Why Iran's Islamic Republic is So Hard to Topple,” *France24*, March 18, 2026, <https://www.france24.com/en/middle-east/20260318-iran-regime-change-khamenei-decapitation-strategy-islamic-republic> (accessed March 18, 2026).

<sup>3</sup> Tim Sullivan, “Embracing Complexity,” *Harvard Business Review*, September 2011, <https://hbr.org/2011/09/embracing-complexity> (accessed March 17, 2026).

<sup>4</sup> Everett Carl Dolman, *Pure Strategy: Power and Principle in the Space and Information Age* (New York, NY: Taylor & Francis Group, 2005), 95, 108-123.

<sup>5</sup> Each ant operates independently, following a simple set of rules based on its environment. There is no “leader” ant giving orders. A colony building intricate nests, finding the most efficient routes to food, and defending the colony emerge from the combined actions of thousands of individual ants. Ant colonies can adapt to changing environments. The behavior of individual ants is influenced by the actions of other ants, creating feedback loops; Real Science, “The Insane Biology of: Ant Colonies,” *YouTube*, February 6, 2021, <https://www.youtube.com/watch?v=VLBDVXLiWxQ> (accessed April 2, 2026).

<sup>6</sup> M. Mithcell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York, NY: Open Road Integrated Media, Inc., 2019), 10.

<sup>7</sup> Hamid Dabashi, “Iran Has Always Been the Largest Target of Invaders and Has Outlived Them All,” *Middle East Eye*, March 17, 2026, <https://www.middleeasteye.net/opinion/iran-outlive-invaders-since-alexander-us-israel-will-fail> (accessed March 18, 2026).

<sup>8</sup> Cherkaoui Roudani, “War Without a Center: Iran’s Mosaic Defense,” March 11, 2026, <https://moderndiplomacy.eu/2026/03/11/war-without-a-center-irans-mosaic-defense/> (accessed March 17, 2026).

<sup>9</sup> Office of the Director of National Intelligence, *Annual Threat Assessment of the U.S. Intelligence Community*, March 2025, <https://www.dni.gov/files/ODNI/documents/assessments/ATA-2025-Unclassified-Report.pdf> (accessed March 17, 2026).

<sup>10</sup> The White House Washington, *Fact Sheet: President Donald J. Trump Restores Maximum Pressure on Iran*, February 4, 2025, <https://www.whitehouse.gov/fact-sheets/2025/02/fact-sheet-president-donald-j-trump-restores-maximum-pressure-on-iran/> (accessed March 17, 2026).

<sup>11</sup> Maziar Motamedi, “Timeline of Protests in Iran After the 1979 Islamic Revolution,” *Aljazeera*, January 5, 2026, <https://www.aljazeera.com/news/2026/1/5/a-timeline-of-protests-in-iran-after-the-1979-islamic-revolution> (accessed March 17, 2026).

<sup>12</sup> Michael Eisenstadt, “The Strategic Culture of the Islamic Republic of Iran: Religion, Expediency, and Soft Power in an Era of Disruptive Change,” *The Washington Institute*, November 23, 2025, <https://www.washingtoninstitute.org/policy-analysis/strategic-culture-islamic-republic-iran-religion-expediency-and-soft-power-era> (accessed March 26, 2026).

<sup>13</sup> Masoud Zamani, “The Ideological Constraints of the Islamic Republic,” *The Washington Institute*, December 6, 2024, <https://www.washingtoninstitute.org/policy-analysis/ideological-constraints-islamic-republic> (accessed March 26, 2026).

<sup>14</sup> Amma Burrows, “Russia is Sending Upgraded Drones Used in the Ukraine War to Iran, Officials Say,” *The Associated Press*, March 27, 2026, <https://nypost.com/2026/03/28/world-news/russia-is-sending-upgraded-drones-used-in-the-ukraine-war-to-iran-officials-say/> (accessed March 30, 2026).

<sup>15</sup> Ghazal Vaisi, “The 25-Year Iran-China Agreement, Endangering 2,500 Years of Heritage,” *Middle East Institute*, March 1, 2022, <https://mei.edu/publication/25-year-iran-china-agreement-endangering-2500-years-heritage/> (accessed March 30, 2026).

<sup>16</sup> In August 1988, Ayatollah Ruhollah Khomeini’s accepted the UN-brokered ceasefire (Resolution 598) which marked the end of the Iran-Iraq War (1980-1988). He described this decision as being “more deadly than taking poison,” reflecting his deep reluctance to end a conflict he had vowed to continue until victory. The acceptance came after years of brutal warfare, immense casualties, and a realization by Iranian military and political leaders that continuing the war was no longer sustainable. This act, often referred to as “drinking the chalice of poison,” signaled a pragmatic shift to ensure the survival of the Islamic Republic, even at the cost of ideological goals. Robert Pear, “Khomeini Accepts ‘Poison’ of Ending the War with Iraq; U.N. Sending Mission,” *New York Times*, July 21, 1988, <https://www.nytimes.com/1988/07/21/us/khomeini-accepts-poison-of-ending-the-war-with-iraq-un-sending-mission.html> (accessed March 30, 2026).

<sup>17</sup> This expression is used as a contradiction to General Douglas MacArthur’s “there is no substitute for victory” in his Farewell Address to Congress, April 19, 1951. “But once war is forced upon us, there is no other alternative than to apply every available means to bring it to a swift end. War's very object is victory — not prolonged indecision. In war, indeed, there can be no substitute for victory. There are some who for varying reasons would appease Red China. They are blind to history's clear lesson. For history teaches with unmistakable emphasis that appeasement but begets new and bloodier war. It points to no single instance where the end has justified that means — where appeasement has led to more than a sham peace. Like blackmail, it lays the basis for new and successively greater demands, until, as in blackmail, violence becomes the only other alternative.” United States House of Representatives, History, Art & Archives: *General Douglas MacArthur Delivered his Farewell Address to a Joint Meeting of Congress*, April 19, 1951, <https://history.house.gov/HistoricalHighlight/Detail/36088> (accessed April 7, 2026).