

The background image shows a large industrial facility, likely a nuclear power plant, under a clear blue sky. In the upper left, the flag of Iran (green, white, and red horizontal stripes with a red emblem in the center) flies from a tall pole. To the right, a tall, red and white striped cooling tower rises into the sky. The main building is a large, multi-story structure with a yellowish-tan facade and several windows. A large, white, dome-shaped structure is visible behind the main building.

Foregone Conclusion? The Interactions Between Global Actions and the Iranian Nuclear Program

Linus Höller
Nonproliferation Researcher

Agenda

1. Personal Introduction
2. Refresher on Nuclear Weapons Production
3. Research Question & Objectives
4. Executive Summary
5. Gaps in Existing Literature
6. Analytical Framework
7. Historical Periods & Hinge Points
8. Key Findings
9. Main Conclusions
10. Policy Relevance & Future Research
11. Time for Questions



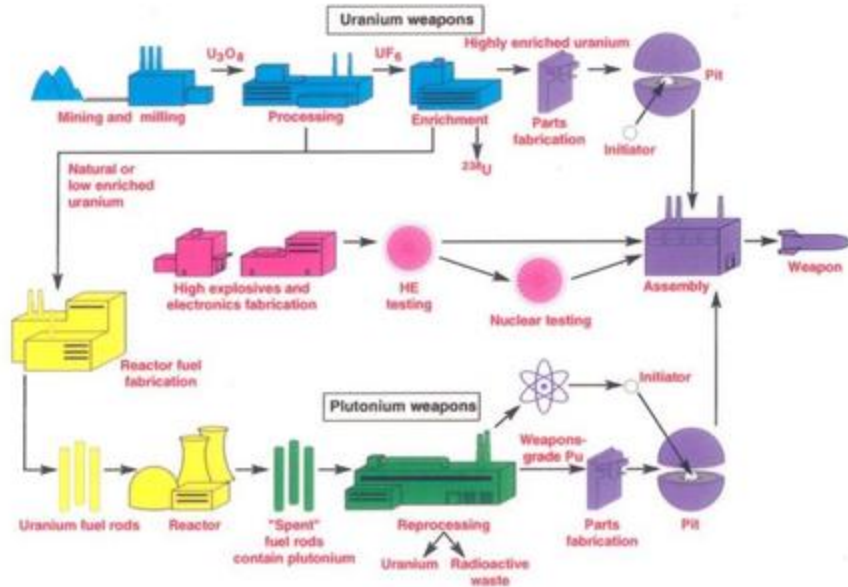
About Me

- MA from MGIMO (International Relations)
- MA from MIIS (Nonproliferation & Terrorism Studies)
- BSc from Northwestern University
- Currently Europe Correspondent & OSINT Investigator for Defense News
- Advisor for OPCW
- Previous work in nonpro topics, including at OPCW, CNS, VCDNP



Refresher on Nuclear Weapons Production

NUCLEAR WEAPONS FACILITIES



Research Question & Objective

Central Question: How have international actions influenced the trajectory of Iran's nuclear program from the 1950s to present?

Key Objectives:

- Examine five distinct periods of Iran's nuclear development
- Analyze specific "hinge points" where international pressure shaped Iranian decisions
- Develop framework for understanding international influence on the Iranian nuclear program & potential transferrable observations

Executive Summary

Key Takeaways:

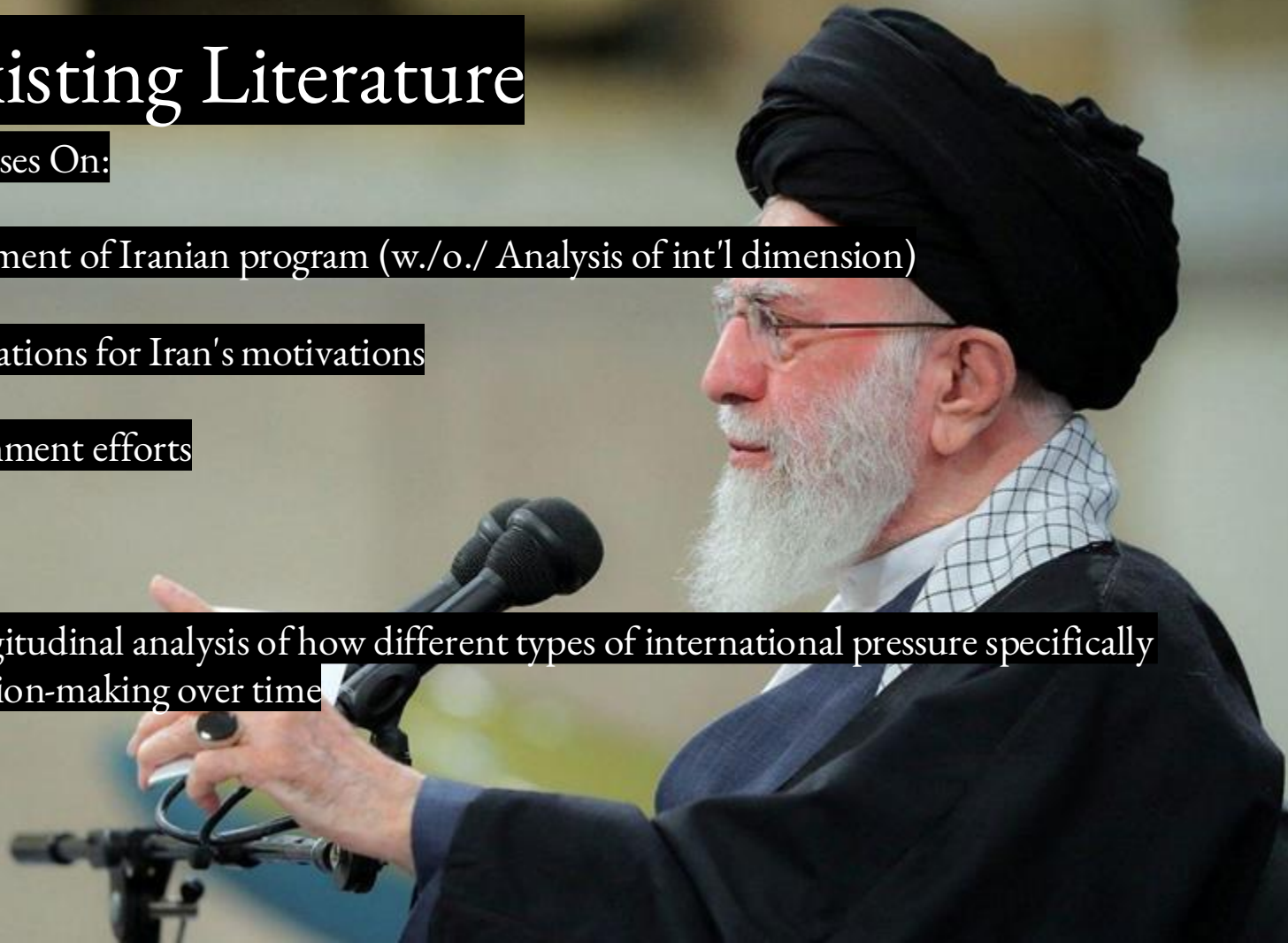
1. Different forms of international pressure had varying effects on the trajectory and pace of the Iranian nuclear program.
2. Coordinated international action was vastly more effective than unilateral threats even by the most powerful countries.
3. A pattern emerges of initial defiance followed by subsequent accommodation/compromise.

Gaps in Existing Literature

Current Literature Focuses On:

- Historical development of Iranian program (w./o./ Analysis of int'l dimension)
- Theoretical explanations for Iran's motivations
- Analysis of containment efforts
- JCPOA

Missing: Systematic longitudinal analysis of how different types of international pressure specifically influenced nuclear decision-making over time



Analytical Framework

Five Types of International Pressure:

1. Diplomatic condemnation (UN resolutions, public rebukes)
1. Economic sanctions (trade restrictions, asset freezes)
1. Military threats/force (strikes, force posturing)
1. Normative pressure (civil society, moral imperatives)
1. Covert technical operations (sabotage, cyber attacks)

Iranian Responses: Acceleratory vs. Deceleratory actions; Pattern of escalation & compromise (Davenport)

Analytical innovation of disaggregating int'l pressure building on Sagan (Why States go Nuclear) and Van der Meer

Methodology

"...the study utilizes a longitudinal, qualitative research design that combines historical process tracing with comparative analysis."

- Process-tracing
- Multi-language source base (German, Russian, Spanish, Farsi, Arabic)
- Wide array of sources ranging from contemporary reporting to interviews, intelligence estimates, secondary academic literature
- Additional use of economic data
- Systematic analysis of hinge points
- Added examination of bidirectional causality in two hinge-points

first systematic longitudinal analysis of international pressure types across Iran's entire nuclear history

Five Historical Periods & Hinge Points

Period	Years	Hinge Point	Defining Form of International Pressure
Shah Era	1959-1979	NPT Accession	Normative
Post-War Resurgence	1985-1995	Iraqi Chemical Attacks	Military Force
Clandestine Activities	1995-2005	Natanz Revelation* *bidirectional causality	Diplomatic
Negotiations & JCPOA	2006-2018	JCPOA Agreement	Economic, Covert
Post-JCPOA	2018-Present	Exceeding JCPOA limits*	Economic, Military

An aerial photograph of a desert landscape, likely in Iran, showing a winding road, a small body of water, and some industrial or military structures. The background image is used as a backdrop for the text.

Key Findings: **Early Periods**

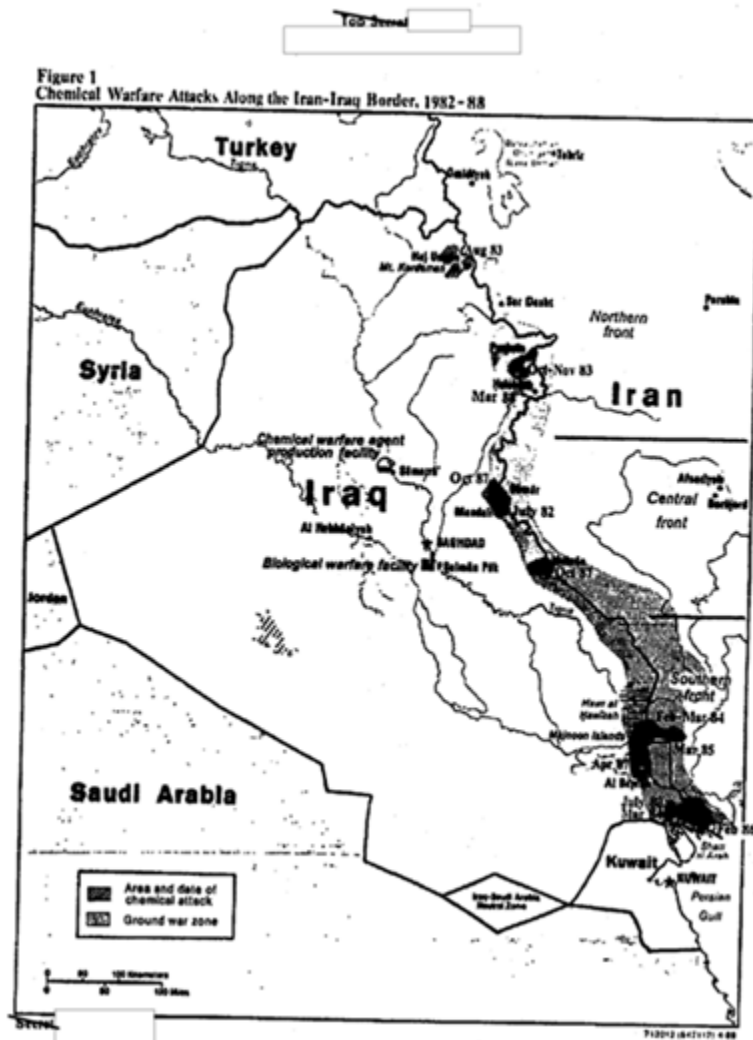
Shah Era (1959-1979)

- Iran signed NPT early despite considering weapons option
- Normative pressure drove compliance with emerging global norms
- Desire for international prestige and legitimacy
- Strong evidence in declassified diplomatic cables, public statements at the time

Post-War (1985-1995)

- Iraqi chemical weapons use and international silence = "strategic loneliness"
- Losses, effects of war & strat loneliness underscored need for deterrent
- No political decision to become a nuclear-armed state, but some discussion
- Evidence in temporal coexistence and Iranian decisionmaker testimonies

A map from a CIA report showing areas of chemical warfare along the Iran-Iraq border between 1982 and 1988.



Key Findings: Later Periods

Clandestine Phase (1995-2005)

- Amad weaponization program
- Covert operations (intelligence) led to program exposure & forced Iran's hand
- Revelation resulted in intense diplomatic pressure and forced negotiations
- Heavy diplomatic activity with limited success; evidenced in contemporary reporting & gov/IO documents

Negotiations & JCPOA (2006-2018)

- Economic sanctions proved effective pressure type, when globally coordinated & legitimized
- Brought negotiations and temporary compliance
- Evidenced by participants interviews, primary and secondary literature, temporal collocation with econ. data

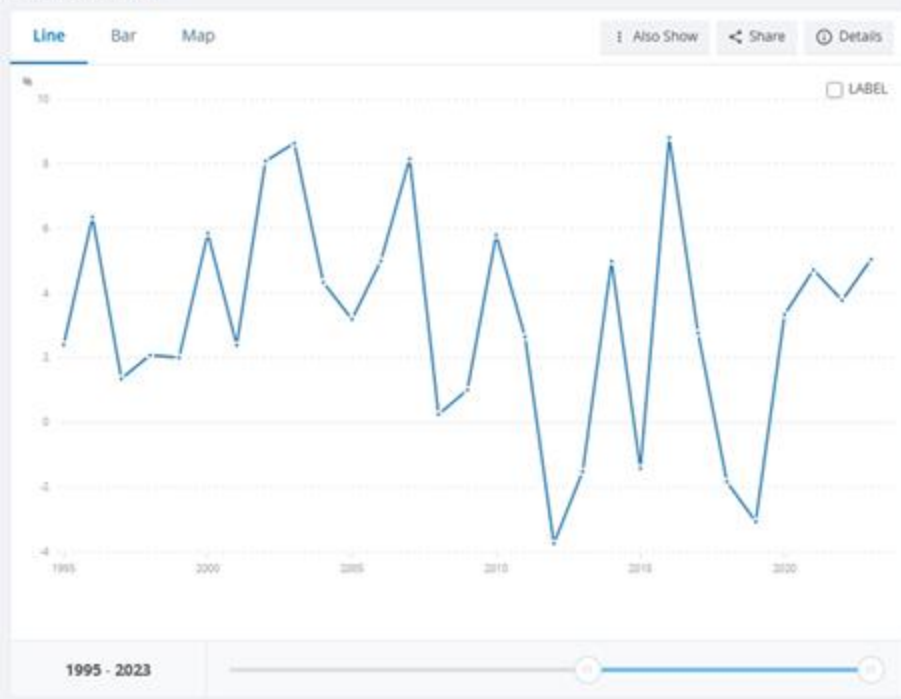
Post-JCPOA (2018-now)

- Trump withdrawal showed limits of coercive diplomacy
- Re-emergence of military dimension

GDP growth (annual %) - Iran, Islamic Rep.

World Bank national accounts data, and OECD National Accounts data files.

License : CC BY-4.0



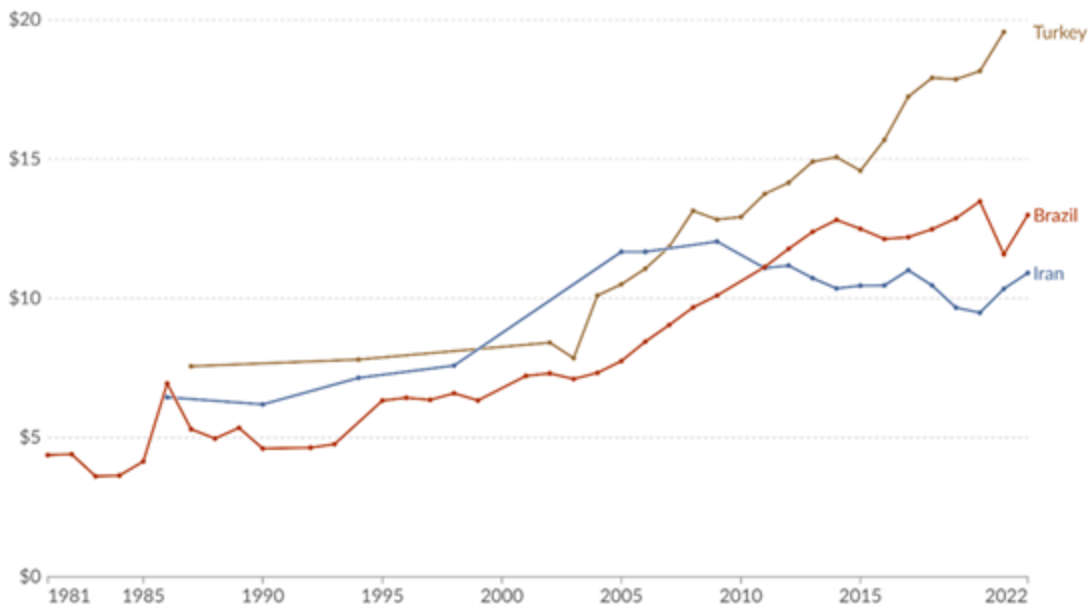
Graph of the annual GDP growth of Iran, according to the World Bank. Note the generally lower GDP growth rates starting in the late 2000s, when global sanctions came into force against the country. Also note the significant rebound in 2016, after the implementation of the JCPOA.



A graph showing the average daily crude oil production by Iran and Iraq from 2000 to 2025. Note the downturn in Iranian crude oil production as the sanctions leading up to the JCPOA are implemented in the early 2010s, while Iraqi oil production soars in the same period. Similarly, the uptick in Iranian oil production after the JCPOA is agreed upon is also visible, followed by a subsequent dip as maximum pressure is imposed by the Trump administration takes effect. Note that the Iraqi oil production, despite also being located in the region, does not follow the same developments, suggesting that these are indeed impacts of the global and U.S. campaigns against Iran.

Median income or consumption per day, 1981 to 2022

This data is adjusted for inflation and for differences in living costs between countries.



Data source: World Bank Poverty and Inequality Platform (2024)

OurWorldinData.org/economic-growth | CC BY

Note: This data is expressed in international-\$¹ at 2017 prices. Depending on the country and year, it relates to income measured after taxes and benefits, or to consumption, per capita².

1. International dollars: International dollars are a hypothetical currency that is used to make meaningful comparisons of monetary indicators of living standards. Figures expressed in international dollars are adjusted for inflation within countries over time, and for differences in the cost of living between countries. The goal of such adjustments is to provide a unit whose purchasing power is held fixed over time and across countries, such that one international dollar can buy the same quantity and quality of goods and services no matter where or when it is spent. Read more in our article: What are Purchasing Power Parity adjustments and why do we need them?

2. Per capita (income): "Per capita" here means that each person (including children) is attributed an equal share of the total income received by all members of their household.

A chart of the median income per day of Iran and two comparable countries, Brazil and Turkey. Note how Iranian prosperity has been largely stagnant since the imposition of external economic pressure in the aftermath of the 2002 nuclear revelations.

Main Conclusions

International actions *do* deeply influence Iranian nuclear decisions. But not all international pressure is deceleratory.

- Different pressure types work at different times; no single approach is always effective.
- Normative pressure was effective early due to the quest for legitimacy.
- Economic sanctions effective but would not have resulted in a change of nuclear trajectory save for diplomatic engagement.
- Military pressure fundamentally altered security calculations & proved mostly acceleratory.
- Covert operations forced transparency, informing int'l community; but also increased defiance.

Iran's nuclear program reflects continuous and ongoing interaction between international pressure and domestic security calculations.

Latest Developments

- June 2025 Israeli-American strikes (differing setback estimates; risk of knock-on effects beyond scope)
- August 2025 Snapback activation: Reintroduces comprehensive sanctions
- September 2025 Cairo agreement with IAEA collapsed within weeks
- November 2025 developments: nuclear cooperation with Russian entities (laser tech for weapons validation; 2 visits)
- Current enrichment status: 400kg of 60% HEU (for context, this is dramatically more than pre-JCPOA)
- Iran says suspended all enrichment but threatens to significantly expand; upgraded centrifuge cascades
- IAEA lost continuity of knowledge regarding Iran's current inventories; unable to visit struck sites
- NPT withdrawal threats

Policy Implications and Future Research

For policymakers

- Diversified and, above all, unified international pressure more effective than single vectors.
- Timing and sequencing of international actions matter; broader context, including domestic & other dimensions of IR must be considered.
- For effective policy, need to have clearly stated aim & need to understand opposing side. Consideration must be given to Iranian historical grievances, isolation and system peculiarities.

Future research

- Apply framework to other threshold states (Japan, Saudi Arabia, Taiwan, ROK)
- Examine role of positive incentives alongside int'l pressure
- Effects of recent Iran-Israel-U.S. confrontation & changes in global dynamics on proliferation, this case and broadly

The background image shows a large industrial facility, likely a nuclear power plant, under a clear blue sky. On the left, a tall flagpole holds the national flag of Iran, which features horizontal stripes of green, white, and red with a red emblem in the center. The plant itself consists of several large, light-colored concrete buildings. A prominent feature is a tall, slender cooling tower with alternating red and white horizontal bands. To the left of the main building, a large, white, dome-shaped structure is visible. The overall scene is brightly lit, suggesting a sunny day.

Thank you for your attention

I will be happy to take any questions

hoeller@u.northwestern.edu