Cyberwarfare : Longitudinal Trends and Effects on Foreign Policy

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Research Questions

- How has the threat actor landscape evolved over the years?
- How has the threat motivation landscape evolved over the years?
- How has the threat categories landscape evolved over the years?
- Case Study : United States as Victims of Cyber Attacks
- Conventional Foreign Policy Actions in interactions between Rival Dyads
- Are conventional foreign policy actions effective in reducing severity of future attacks ?

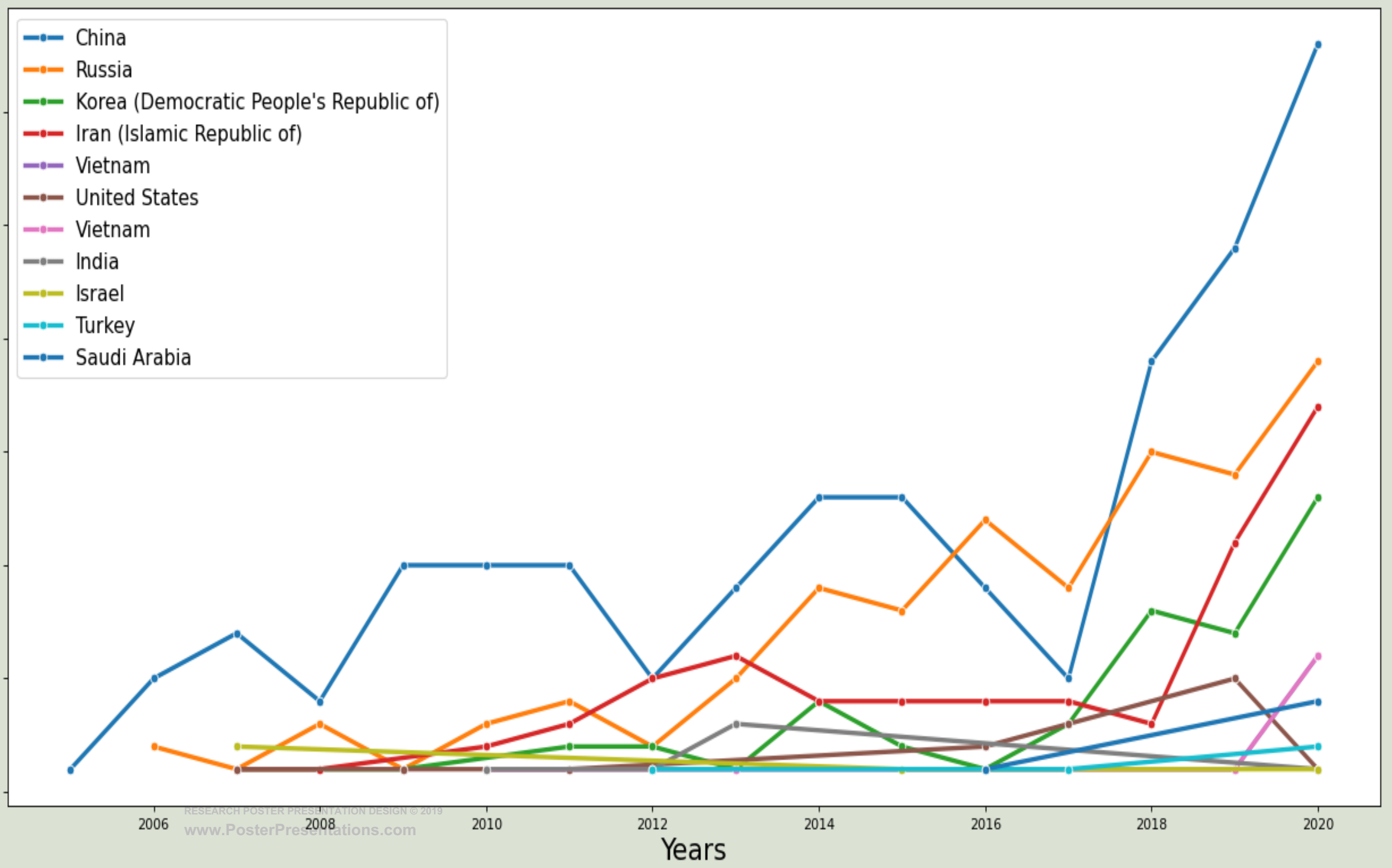
Background

- Attribution of Cyber Attacks is a complicated process
  - False flags
  - Shared code on cyber attacks
- Study : State-sponsored cyber attacks
  - Government press-releases
  - Reports from cybersecurity companies
  - Forensic analysis of cyber attacks confirming the affiliation of states

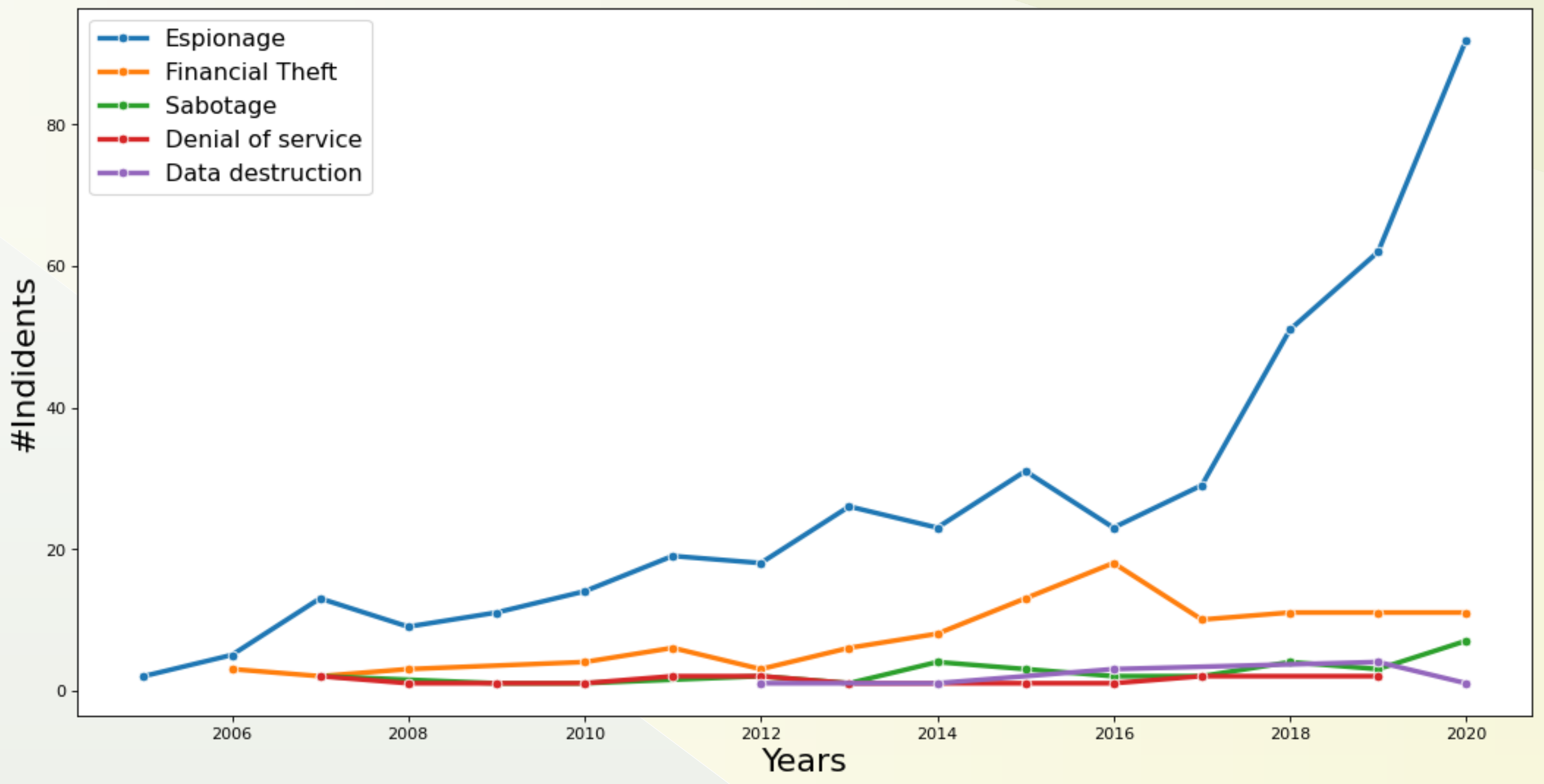
Dataset

- Compiled and aggregated data from three different data sources
- Normalized, Deduplicated entries across sources
- Comprehensive dataset of state-sponsored Cyber Attacks
- Conventional Foreign Policy Changes
  - Dyadic Cyber Incident and Campaign Dataset (DCID)
  - Integrated Crisis Early Warning System (ICEWS) events
  - Diplomatic, Economic, Military actions between rival dyads
- Sources:
  - Kaspersky Targeted Cyber Attacks Logbook
  - Council on Foreign Relations (CFR's) Cyber Operations Tracker
  - Threat Actor Encyclopedia by Thailand Computer Emergency Response Team

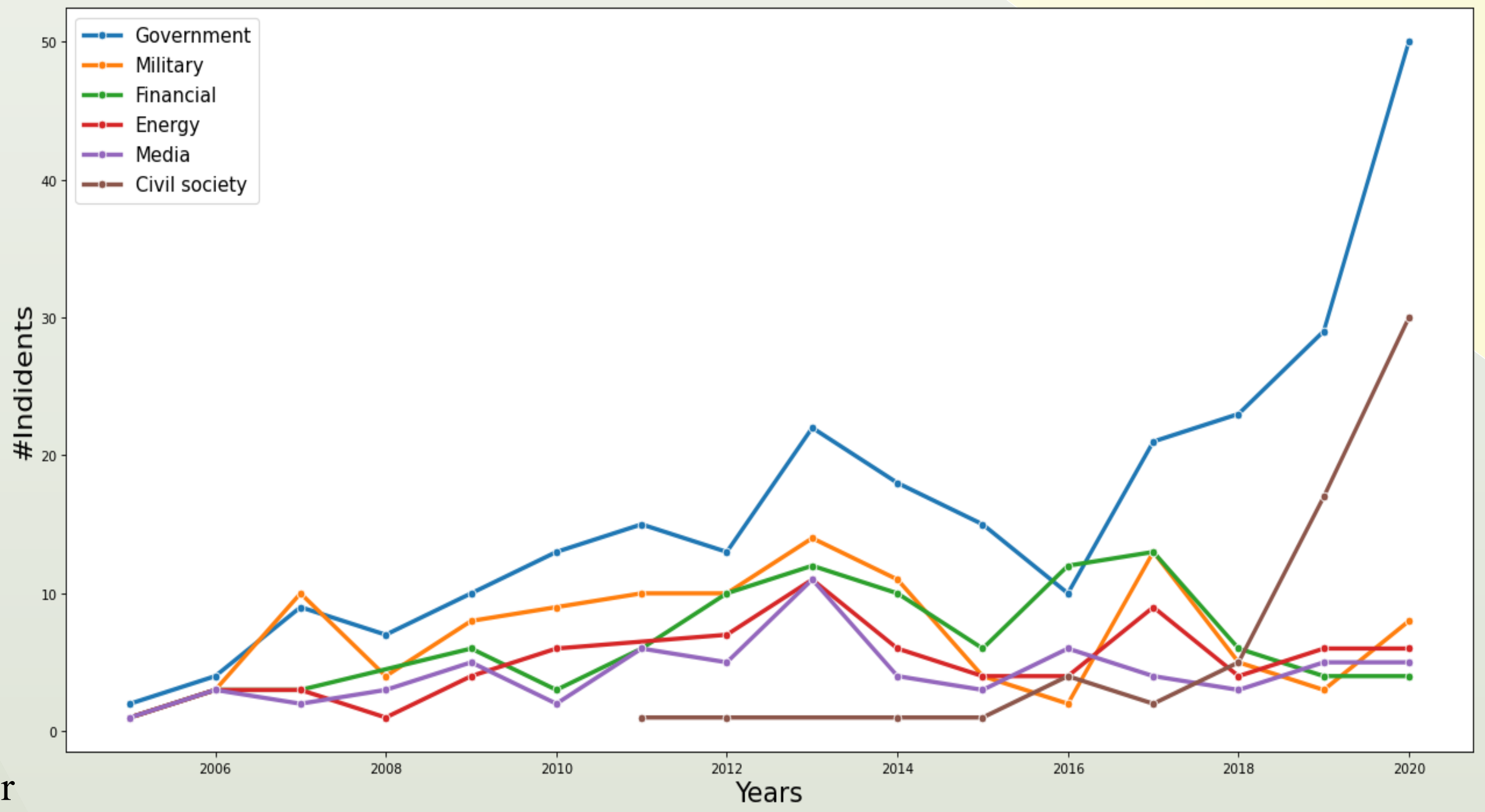
Threat Actor Evolution Over The Years



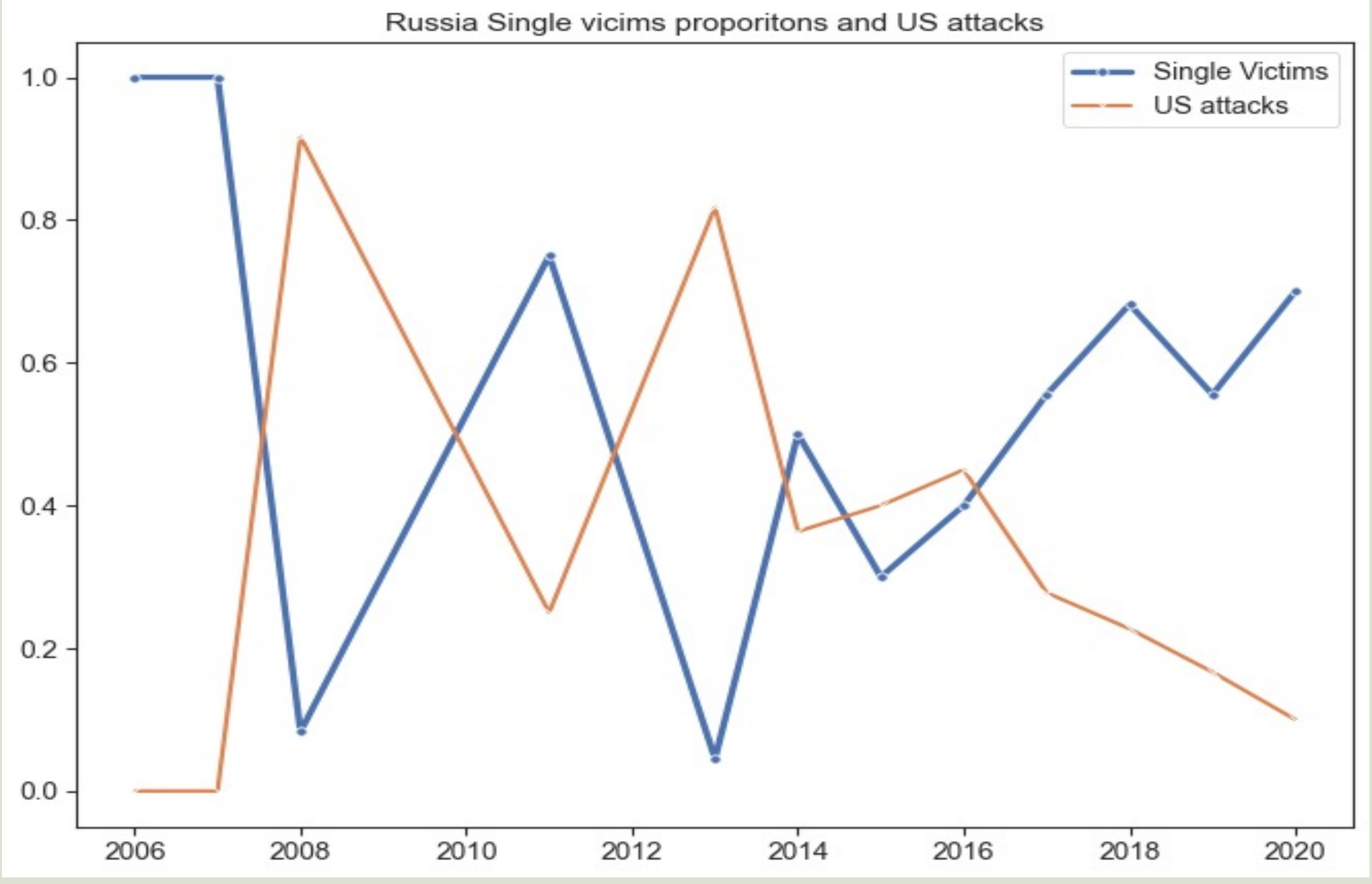
Threat Motivation Evolution Over The Years

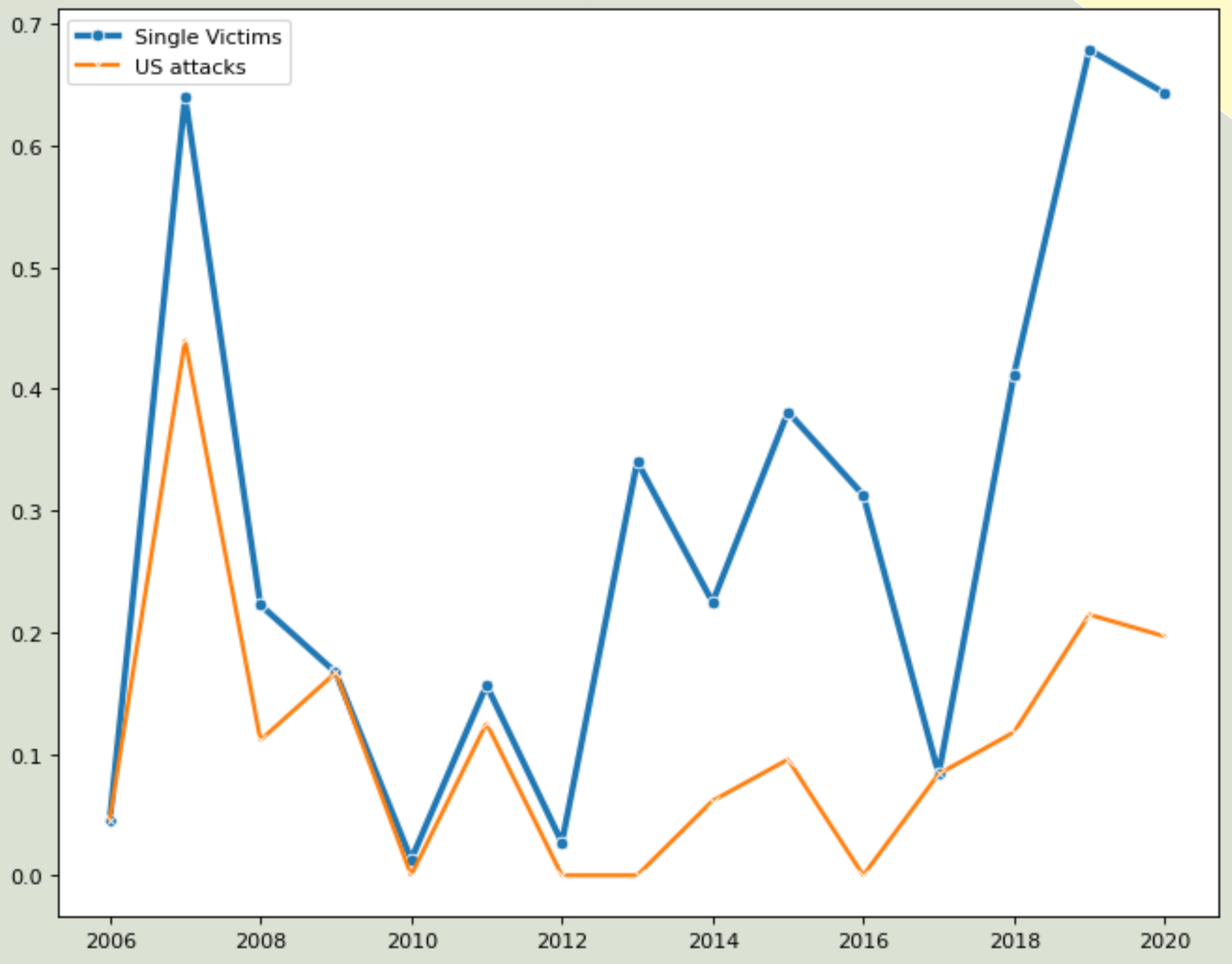


Threat Categories Over The Years



Russia and China : Singling out Attack Victims





Mean Cyber Severity Change As Effect of Policy Actions between Rival Dyads

Rivalry	Mean Cyber Severity Change
Russia-US	-0.073
Iran-US	0.25
Russia-Ukraine	-1.134
Iran-Israel	-0.325
China-US	-0.18

Mean Cyber Severity Change by Policy Actions

Policy Action	Mean Cyber Severity Change
Diplomatic Deny / Reject	-0.233
Economic Reduce	-0.090
Economic Threat	0.135
Economic Embargo / Sanction	0.259
Military Display	-0.111
Military Usage	-0.368

Takeaways

- Civil society sectors have been on the rise of targets.
  - Cyber-safety awareness and cyber-hygiene on the individual level
- Empirical analysis suggests us that intellectual agreement between China and US in 2015 to stop intellectual property theft was not effective after the Trump administration; largely due to the rhetoric of Trump administration against Beijing.
- China has been singling out cyber attacks against US
- With the flourishing of modern crypto-currency, financial theft could be the next big sector of cyber attacks after Espionage.
- Most of the conventional foreign policy actions have been impactful to some extent in helping decrease the volume of attacks in the future, which is a welcoming sign.
- Iran-US, Iran-Saudi Arabia, and China-Philippines have led to rather severe cyber attacks in the future.
  - Future work : What Went wrong between these countries ?
- Economic embargo and economic threat come out as the least effective foreign policy actions with regards to reduced severity of future attacks.
- While Military actions seem to be effective, diplomatic actions are also equally as effective in helping reduce the severity of future incidents.
- Policy Recommendation : Diplomatic foreign policy actions are the way to go !!

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