Military spending and economic growth: the case of Iran

Mohammad Reza Farzanegan
Military Spending and Economic Growth: The Case of Iran

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Agenda

1. Motivation
2. Data and Model
3. Results
4. Summary and conclusion
Motivation: Military Spending In Iran

- According to the WDI (2012), in 2000s, on average, Iran’s military expenditures as a share of total expenditures amount to 16% which was higher than the average of this budget in:
  - Middle East and North Africa (13%),
  - OECD countries (10%),
  - Latin America (7%) and
  - the European Union (5%).
Motivation: Where The Money Goes…?

- Trend of budget allocation into different groups of spending within the Iranian government after the war with Iraq:
  - Share of military spending in total spending was 16% in 1993, it has reached 52% in 2006.
  - Share of education spending at the same period shows a reduction from 27% to 15%.
  - Same pattern can be observed for the case of spending on health and social affairs.
  - The country has gone to more militarization and strengthening of military linkages to the national economy.
Motivation

Budget Allocation to Different Spending Categories in Iran (2007)

Source: CBI (2012) and author’s calculations
Motivation: Military & The Economy…

- Islamic Revolutionary Guard Corps (IRGC, Sepah & its engineering arm *Khatam-ol-Anbia*): main military organization which has strong role in the Iranian economy.

- In 2009, the estimated amount of the IRGC projects in road, dam, oil and gas fields was $15 billion!

- Easy access to the (former) Oil Stabilization Fund (financial nepotism thanks to its military influence).

- IRGC has also established its own banks such as *Ansar Bank* and Mehr Finance and Credit Institution!

- The IRGC is rapidly expanding its influence on different aspects of the formal and informal Iranian economy.

- **Main target of the US & EU Sanctions…**
Motivation: Sanctions…

- Current United States and the European Union pressures on the energy industry of Iran aim to **affect the Iranian military ambitions and its financial sources**.

- For the first time, **32 countries** representing more than a billion consumers have taken action against Iran: **the European Union, Canada, Australia, Japan and South Korea** among others…

- Approximately **90%** of Iran foreign exchange reserves depend on oil exports and **about 60%** of the Iranian budget ties with oil revenues…

- Farzanegan (2011) shows that military and domestic security expenditures of the Iranian government are the **only category** which respond statistically significantly to asymmetric shocks in oil prices or oil revenues…
Motivation: Our goal in this study

➢ To investigate the dynamic relationship between military spending and economic growth in Iran.

➢ If energy sanctions affect the military expenditures in a significant way, what kind of implications will it have for the economic growth?

➢ Are economic development responses to shocks in military budget statistically significant?

➢ Is there a causal relationship between these two variables?

➢ In the case of a lack of significant feedback from the Iranian gross domestic product (GDP), the targeted sanctions can only affect the military budget without causing economic slowdown.
Data & Model

➢ To examine the dynamic effects of military spending shocks on the Iranian economic growth and *vice versa*, we made use of two variables:
   - military expenditures and GDP per capita.

➢ Both variables are in constant prices (billion rials) of 1997 and in logarithmic form.

➢ Percentage change of variables defined as the first difference of logarithmic transformation is used in the subsequent analysis.

➢ We use the share of military spending in total government spending and in GDP as well as per capita spending as proxies for the defense burden in the economy.

➢ Annual observations from 1959-2007 from National Accounts of Iran published by the Central Bank of Iran.

➢ Control for Iran-Iraq war (1980-1988) and the post-11th September 2001 events.
Data & Model

- Alternative source for military spending data is the Stockholm International Peace Research Institute (SIPRI).

- The main shortcoming of this database for our specific time series analysis is its low sample size (1988-2008).

- But correlation between SIPRI and CBI data is high: SIPRI data reflects the official data reported by governments.
  
  - Correlation between these two time series is 0.45 (with $t$-statistics of 2.16, $p$-value of 0.04 which is an indicator of significant correlation).

  - There is also a high correlation (0.98, with $t$-statistics of 24.2) between per capita military spending on the basis of the Central Bank of Iran and the SIPRI data.
Data & Model

Co-movement of military spending (% of GDP) variables
Data & Model

Co-movement of military spending (% of total government spending) variables
Data and Empirical Approach

- We apply the unrestricted VAR model
  - Impulse Response Functions
  - Variance Decomposition Analysis
- Toda and Yamamoto (T-Y) (1995) to test the Granger causality

\[
y_t = \sum_{i=1}^{p} A_i \cdot y_{t-i} + B \cdot X_t + e_t
\]

- where \( y_t \) is a vector of endogenous variables,
- \( X_t \) is a vector of exogenous variables whose values are determined outside of the VAR system
- \( A_i \) and \( B \) are coefficient matrices and \( p \) is the optimum lag number.

\( y_t = [\text{Military spending, GDP per capita}] \)
Data and Empirical Approach

- The vector of exogenous variables is as follows: \( X_t = [\text{constant}, w1, w2] \)

  - where \( w1 \) and \( w2 \) control the special situation under the Iran-Iraq war (1980-1988) and post 11\(^{th}\) September 2001 events.

- We try two different Cholesky orderings of variables.

- In one ordering, military spending has an immediate impact on income but affects itself with lags.

- As the impulse response may be sensitive to the order of variables, for robustness test we also use Generalized Impulse Response introduced by Pesaran and Shin (1998).
Results
Toda and Yamamoto granger causality

Strong evidence for the T-Y Granger causality from military spending (in per capita or as a share of GDP) to GDP per capita, but not vice versa.

**T-Y Granger causality (using international sources of data)**

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Chi-</th>
<th>probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>level of real military spending per capita <em>does not Granger Cause</em> level of real GDP per capita.</td>
<td>12.48</td>
<td><strong>0.00</strong></td>
</tr>
<tr>
<td>level of real GDP per capita <em>does not Granger Cause</em> level of real military spending per capita.</td>
<td>0.56</td>
<td>0.75</td>
</tr>
<tr>
<td>level of real military spending (% of GDP) <em>does not Granger Cause</em> level of real GDP per capita.</td>
<td>2.91</td>
<td><strong>0.08</strong></td>
</tr>
<tr>
<td>level of real GDP per capita <em>does not Granger Cause</em> level of real military spending (% of GDP).</td>
<td>0.39</td>
<td>0.52</td>
</tr>
</tbody>
</table>
## Results

### Variance decomposition analysis - using per capita military spending

<table>
<thead>
<tr>
<th>Years ahead</th>
<th>Variance decomposition of real GDP per capita growth</th>
<th>Variance decomposition of military spending per capita growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% due to military spending per capita growth</td>
<td>% due to real GDP per capita growth</td>
</tr>
<tr>
<td>1</td>
<td>8.18</td>
<td>91.81</td>
</tr>
<tr>
<td>2</td>
<td>17.11</td>
<td>82.88</td>
</tr>
<tr>
<td>3</td>
<td>36.16</td>
<td>63.83</td>
</tr>
<tr>
<td>4</td>
<td>36.58</td>
<td>63.43</td>
</tr>
<tr>
<td>5</td>
<td>39.16</td>
<td>60.83</td>
</tr>
<tr>
<td>10</td>
<td>43.97</td>
<td>56.02</td>
</tr>
<tr>
<td>15</td>
<td>43.95</td>
<td>53.04</td>
</tr>
<tr>
<td>20</td>
<td>43.99</td>
<td>56.00</td>
</tr>
</tbody>
</table>
Results

Response of GDP p.c. growth to a shock in military spending share growth
Results

Response of military spending share growth to a shock in GDP p.c. growth
Results

Response of GDP p.c. growth to a shock in military spending

p.c. growth - Generalized Impulses
Results

Response of *military spending p.c. growth* to a shock in *GDP p.c. growth* - Generalized Impulses
Conclusion and Policy Implications

➢ This study examines the dynamic interactions between the economic growth and military spending of the Iranian government.

➢ Policy message:

➢ One way granger causality from military spending to economic growth.

➢ Sanctions on free trade and banking transactions which initially affect the macroeconomy of Iran do not necessarily shape the future military budget of Iran.

➢ Energy sanctions and recent direct military sanctions not only may limit the military spending of the Iranian state but will also dampen the economic growth.