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The Analysis of Whether India Views China as a Military Security Threat from a Quantitative Perspective

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Abstract

China is a neighboring major country of India. Many scholars have consistently emphasized in their papers that India regards China as its biggest military threat. If this viewpoint is fair, then India's military defense will inevitably be influenced by China. In other words, the military defense of China and India should be highly correlated. National defense and military can be measured by two indicators: weapon throughput and the proportion of military expenditure to domestic GDP. According to the dimensionless operation and entropy weight method in quantitative analysis, the weights of two indicators can be obtained and their correlation can be analyzed. After quantitative analysis, there is a weak correlation between the military defense of China and India. So, it can be concluded that India does not fully consider China as the main military threat.

Keywords: dimensionless quantification, information entropy, weight, weapon throughput, India's military expenditure

1. Introduction

Does India regard China as a military security threat? For India, China is its most significant neighboring country. It has long been widely believed in academic circles that India's defense spending is consistently influenced by China. In other words, scholars generally believe that India has always regarded China as its greatest military threat. Most existing research by scholars on this issue focuses on three aspects:

First, analyzing the factual basis for India's view of China as its greatest military threat. These scholars tend to use speeches from Indian officials, official Indian documents, and even research reports from polling institutions as evidence to support the viewpoint that "India regards China as its greatest military threat." (Guancha Syndicate, 2021) A major issue with this research approach is that it focuses on representation while neglecting the essence. Drawing conclusions based solely on statements from Indian officials or content in official documents may overlook the true intentions, as these official statements are often just bluffs or smokescreens.

Second, explaining why India views China as its greatest military threat. Some scholars approach this from the perspective of India's strategic culture, national psychology, and historical factors, emphasizing that India's negative perception of China and its focus on military defense are influenced by China. (Meng Qinglong, 2021) Other scholars have analyzed the issue from a psychological perspective, concluding that, in India's perception, China is its greatest defense and military threat (Huang Yan, 2022). This research approach mainly explores the "why" aspect, but it has some significant issues: First, the explanations are primarily qualitative, making it difficult to remain neutral and objective. For example, different scholars have varying interpretations of concepts like strategic culture and the nature of India's strategic culture, making it hard to avoid subjective content in such interpretations. Additionally, explaining the issue from a psychological perspective means fully personifying

India, even though there are clear distinctions between a “nation” and an “individual.”

Third, how should China respond under the premise that India views China as its greatest threat? Some scholars have focused primarily on policy recommendations. (Tong Yutao, 2023) The biggest issue with this approach is its preconceived notion, assuming that “India views China as its greatest threat” is correct. Since the premise of the research may be biased, any policy recommendations based on it are likely to be biased as well.

In conclusion, it is difficult to achieve complete neutrality and objectivity when explaining this issue from a qualitative perspective. This article attempts to address the issue from a quantitative perspective. A quantitative approach analyzes “what India has done” rather than “what India has stated.” Relying on facts and data allows for a greater degree of objectivity and neutrality in research.

2. Research Hypothesis and Approach

The reason why nations place great emphasis on military defense is to ensure their own security. If Country A regards Country B as its greatest military threat or adversary, then Country A will closely monitor Country B’s developments in military defense and will adjust its own defense posture accordingly. In other words, if Country A views Country B as a military threat, the defense data of both countries should show a high degree of correlation.

Is India really treating China as a military threat? To answer this question, quantitative analysis based on specific data is required. If India indeed views China as a hypothetical enemy, then when key military-related data of China changes, the corresponding data of India should also change accordingly.

The research approach of this paper is divided into the following steps:

1) Indicator setting.

2) Data extraction.

3) Dimensionless processing of the extracted indicators and data, standardizing units to obtain a new set of data that reflects the military defense of both China and India.

4) Using the entropy weight method to calculate weights.

5) Data integration.

6) Conducting a correlation analysis of the data and drawing conclusions.

3. Selection of Indicators

This paper seeks to answer the question: Does India perceive China as a military threat? To address this question, it is necessary to collect key military and defense-related data from both India and China as indicators. This study focuses on collecting the TIV values, weapons transfer volumes, and military expenditure as a percentage of GDP from the Stockholm database to evaluate the extent of both countries’ emphasis on military defense.

- TIV Value

In the Stockholm International Peace Research Institute (SIPRI) Arms Transfers Database, the data on arms imports and exports between countries are not expressed in monetary terms. Instead, the database uses a specific measurement standard known as the TIV (Trend Indicator Value). The timing, type, and quantity of arms transfers between countries vary significantly. Evaluating arms transfers solely based on monetary value or quantity cannot account for various unrelated variables. The TIV provides a unified standard by processing all arms units into dimensionless values. The larger the TIV, the more a country has invested in arms transfers; conversely, a smaller TIV indicates less investment in arms transfers between countries. (Geng Shangxun, 2024)

- Weapons Transfer Volume

In the Stockholm Arms Transfers Database, a country can act as both an importer and exporter of weapons. When a country imports weapons, it indicates that the country is prioritizing military preparedness, aiming to compensate for its military shortcomings through the acquisition of foreign arms. Conversely, when a country exports or donates weapons, it reflects its intention to leverage military power to achieve political, economic, or other objectives. In such cases, even though the ultimate goal may not be military, military strength still serves as a foundation.

Thus, whether a country imports or exports arms, it demonstrates its focus on military matters. To simplify the research, the total TIV of arms imported and exported by a country in a given year can be summed. This total represents the country’s weapons transfer volume. A larger volume suggests a higher emphasis on military defense, while a smaller volume indicates less emphasis on military defense.

- Military Expenditure as a Percentage of GDP

Is a country prioritizing military defense? This question can also be answered by examining a country’s military

spending. In the Stockholm Arms Transfers Database, various types of data related to a country's military expenditure are available, such as military spending in the national currency, military expenditure as a percentage of gross domestic product (GDP), and military spending in U.S. dollars. Among these indicators, it is crucial to identify the best one.

If military spending in monetary terms is solely used as an indicator to measure how much a country values its military, the problem arises of not accounting for unrelated variables. First, if a country's economy grows, military expenditure also increases. In this case, is the increase in military spending due to economic growth or the country's emphasis on military security? Second, fluctuations in exchange rates introduce another unrelated variable. Therefore, using military expenditure as a percentage of GDP is a more reliable indicator. It more directly reflects a country's focus on military matters and its level of commitment to defense.

4. Quantitative Data Analysis Operations

This section consists of several steps: First, obtaining the raw data for India's and China's weapons transfer volumes and military expenditure as a percentage of GDP. Second, performing dimensionless processing on the raw data. Third, using the "entropy weight method" to calculate the weight proportions of the two indicators (weapons transfer volume and military expenditure as a percentage of GDP) in the defense and military context of India and China. Fourth, conducting a correlation analysis. R-Studio and Excel techniques are used in this section for data integration and analysis.

- Obtaining Raw Data

4.1 Obtaining India's Annual Weapons Transfer Volume Data

By using R programming techniques for grouping, summing, and merging TIV data, India's annual weapons transfer volume can be calculated from the Stockholm Arms Transfers Database. The following table shows India's annual weapons transfer volume data:

Table 1. India's Annual Weapons Transfer Volume Values

Year	India's Annual Weapons Transfer Volume Values	Year	India's Annual Weapons Transfer Volume Values	Year	India's Annual Weapons Transfer Volume Values
1948	116.16	1978	265.85	2007	4918.5
1949	11	1979	2932.2	2008	4587.25
1950	1237.1	1980	4259.2	2009	2523.64
1951	67.7	1981	1037.5	2010	1747.4
1952	138.71	1982	5681.3	2011	2964
1953	284.8	1983	5282.35	2012	3060.05
1954	831.36	1983	5282.35	2013	2203.69
1955	199.21	1984	4587.5	2014	272.7
1956	1567.76	1985	4092	2015	801.94
1957	1759.2	1986	2820.94	2016	913.1
1958	102.4	1987	2713.5	2017	3921.95
1959	505.3	1988	970.02	2018	807.55
1960	686.72	1989	567.5	2019	701.1
1961	3514.2	1990	272	2020	473.36
1962	3926.73	1991	1.9	2021	212.48
1963	653.9	1992	486.42	2022	13
1964	579.6	1993	492.91	2023	35.8
1965	1596.53	1994	389.4	...	...
1966	1200.75	1995	303	...	...
1967	1067.22	1996	3178.14	...	...
1968	928.38	1997	1819.18	...	...
1969	678	1998	1852.84	...	...

1970	772.88	1999	1292.9	...	...
1971	2247.68	2000	1191.65	...	...
1972	3748.08	2001	10531.07	...	...
1973	548.9	2002	369.84	...	...
1974	1336.4	2003	691.61	...	...
1975	2581.26	2004	4304.1	...	...
1976	3909.73	2005	2631.43	...	...
1977	377.8	2006	2983.7	...	...

Source: https://www.sipri.org/databases/armstransfers.

4.2 Obtaining China's Annual Weapons Transfer Volume Data

Using the same method, China's annual weapons transfer volume can also be calculated. The following table shows China's annual weapons transfer volume data:

Table 2. China's Annual Weapons Transfer Volume Values

Year	China's Annual Weapons Transfer Volume Values	Year	China's Annual Weapons Transfer Volume Values
1949	7038.15	1987	989.4
1950	889.97	1988	3332.36
1951	5730	1989	1632.32
1952	3716.5	1990	2100.64
1953	4751.5	1991	2014.65
1954	6213.78	1992	3367.23
1955	745.22	1993	1916.1
1956	182.2	1994	558.2
1957	1943.3	1995	3597.06
1958	1091.53	1996	4748.5
1959	613.11	1997	1473.9
1960	131.25	1998	4456.5
1961	30	1999	4992.84
1962	398.9	2000	1343.35
1963	345.3	2001	3749.05
1964	378.92	2002	4687.5
1965	1743.33	2003	1592.49
1966	601.14	2004	2498
1967	817.5	2005	3143.81
1968	818	2006	2884.45
1969	589.5	2007	405.28
1970	1056.17	2008	1789.86
1971	1313.1	2009	2509.12
1972	413.4	2010	1382.5
1973	1553.1	2011	4254.6
1974	564.9	2012	3152.85
1975	2020.6	2013	1348.3

1976	300.26	2014	1347.2
1977	411.28	2015	5700.07
1978	1058.2	2016	864.11
1979	508.3	2017	2454.83
1980	1551.05	2018	1094.38
1981	3359.25	2019	1590.7
1982	3414.8	2020	680.88
1983	1349.13	2021	1206.11
1984	449.65	2022	116.6
1985	949.77	2023	80.6
1986	2597.76	2024	...

Source: https://www.sipri.org/databases/armstransfers.

4.3 Obtaining the Annual Military Expenditure as a Percentage of GDP for China and India

In the Stockholm database, the annual military expenditure as a percentage of GDP for both China and India can be retrieved. The data is shown in the table below:

Table 3. Military Expenditure as a Percentage of GDP for China and India

Year	India	China	Year	India	China
1948	...	...	1986	4.11%	...
1949	...	...	1987	4.23%	...
1950	...	...	1988	3.73%	...
1951	...	...	1989	3.53%	2.45%
1952	...	...	1990	3.15%	2.45%
1953	...	...	1991	2.91%	2.31%
1954	...	...	1992	2.70%	2.45%
1955	...	...	1993	2.82%	1.93%
1956	2.02%	...	1994	2.66%	1.69%
1957	2.48%	...	1995	2.58%	1.69%
1958	1.92%	...	1996	2.47%	1.65%
1959	2.14%	...	1997	2.65%	1.63%
1960	2.00%	...	1998	2.73%	1.66%
1961	2.07%	...	1999	2.96%	1.87%
1962	2.75%	...	2000	2.95%	1.84%
1963	4.03%	...	2001	2.92%	1.98%
1964	3.82%	...	2002	2.83%	2.06%
1965	3.87%	...	2003	2.68%	2.00%
1966	3.57%	...	2004	2.83%	1.94%
1967	3.22%	...	2005	2.91%	1.87%
1968	3.25%	...	2006	2.68%	1.87%
1969	3.14%	...	2007	2.48%	1.75%
1970	3.19%	...	2008	2.63%	1.72%
1971	3.65%	...	2009	3.13%	1.89%
1972	3.72%	...	2010	2.89%	1.73%
1973	3.16%	...	2011	2.70%	1.66%

1974	3.20%	...	2012	2.62%	1.70%
1975	3.53%	...	2013	2.55%	1.71%
1976	3.48%	...	2014	2.54%	1.74%
1977	3.16%	...	2015	2.46%	1.78%
1978	3.13%	...	2016	2.54%	1.77%
1979	3.26%	...	2017	2.53%	1.71%
1980	3.13%	...	2018	2.42%	1.67%
1981	3.19%	...	2019	2.55%	1.68%
1982	3.35%	...	2020	2.81%	1.76%
1983	3.32%	...	2021	2.48%	1.61%
1984	3.42%	...	2022	236%	1.62%
1985	3.57%	...	2023	2.44%	1.67%

Source: https://www.sipri.org/databases/milex.

- Dimensionless Processing and Data Handling

Dimensionless processing refers to the operation of converting two sets of data with different units into data with unified units through specific transformations. (Sui Xinmin, 2014) It can be observed that the data for the military expenditure as a percentage of GDP for some years in China and India are missing. Therefore, the available data are divided into two periods: the first period from 1960 to 1989, and the second period from 1989 to 2023.

For the first period, a direct analysis of the correlation between the weapons transfer volumes of China and India can be conducted. For the second period, both weapons transfer volume and military expenditure as a percentage of GDP need to undergo dimensionless processing and weight calculation, after which a correlation analysis can be performed.

1) The results of the correlation analysis for the first period are shown in the figure below:

```
> 第一段数据 <- read.csv("~/第一段数据.csv")
>   View(第一段数据)
> data<-data.frame(第一段数据)
> cor(data$印度,data$中国)
[1] 0.0860077
> cor(data$中国,data$印度)
[1] 0.0860077
> model<-lm(data$印度~data$中国,data=data)
> model

Call:
lm(formula = data$印度 ~ data$中国, data = data)

Coefficients:
(Intercept)    data$中国
  2014.9478       0.1475

> summary(model)

Call:
lm(formula = data$印度 ~ data$中国, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-1905.2 -1420.9  -718.8  1627.8  3162.6

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 2014.9478   481.7836   4.182 0.000257 ***
data$中国      0.1475     0.3230   0.457 0.651337
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1668 on 28 degrees of freedom
Multiple R-squared:  0.007397,  Adjusted R-squared:  -0.02805
F-statistic: 0.2087 on 1 and 28 DF,  p-value: 0.6513
```

Figure 1. Correlation Analysis of Weapons Transfer Volume Data Between China and India (1960-1989)

Source: Created by the author.

By conducting a correlation analysis on the weapons transfer volume data of China and India from 1960 to 1989, it is found that the correlation coefficient is 0.086. This suggests that while India and China have a positive correlation, the correlation is relatively weak.

2) Dimensionless Processing and Correlation Analysis of the Second Period:

The second period spans from 1989 to 2023, during which the data for both countries' weapons transfer volumes and military expenditure as a percentage of GDP are fully recorded. However, since the units of measurement for these two indicators differ, dimensionless processing is required to normalize the weapons transfer volume and military expenditure as a percentage of GDP.

Next, the respective weights of these indicators are calculated, and a weighted composite value is derived. This composite value reflects the degree of importance India and China place on military defense. Analyzing the correlation between the two composite values will help answer whether India is influenced by China.

Since both weapons transfer volume and military expenditure as a percentage of GDP are positive indicators, only positive dimensionless processing is necessary. The results of the data standardization operation in the R-Studio are as follows:

(1) The results of the dimensionless processing of India's weapons transfer volume data are shown in the figure below:

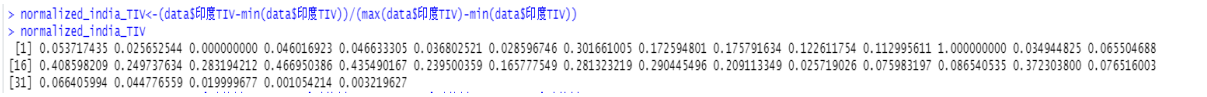


Figure 2. Dimensionless Values of India's Weapons Transfer Volume

Source: Created by the author.

(2) The results of the dimensionless processing of India's military expenditure as a percentage of GDP are shown in the figure below:

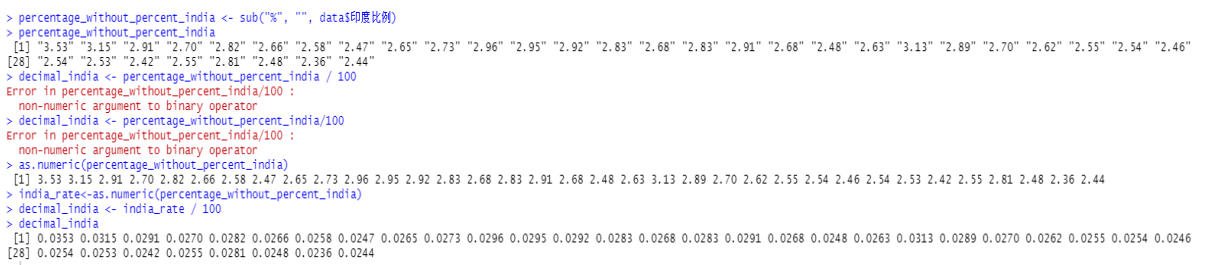


Figure 3. Dimensionless Values of India's Military Expenditure as a Percentage of GDP

Source: Created by the author.

(3) The results of the dimensionless processing of China's weapons transfer volume are shown in the figure below:

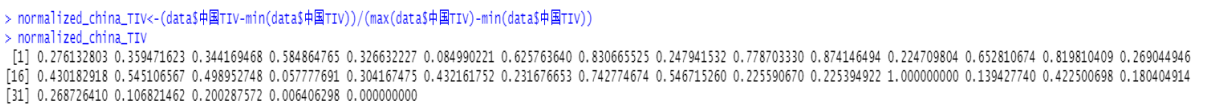


Figure 4. Dimensionless Values of China's Weapons Transfer Volume

Source: Created by the author.

(4) The results of the dimensionless processing of the relevant data for China's military expenditure as a percentage of GDP are shown in the figure below:

```
> percentage_without_percent_china <- sub("%", "", data$中国比例)
> percentage_without_percent_china
 [1] "2.45" "2.45" "2.31" "2.45" "1.93" "1.69" "1.69" "1.65" "1.63" "1.66" "1.87" "1.84" "1.98" "2.06" "2.00" "1.94" "1.87" "1.87" "1.75" "1.72" "1.89" "1.73" "1.66" "1.70" "1.71" "1.74" "1.78"
[28] "1.77" "1.71" "1.67" "1.68" "1.76" "1.61" "1.62" "1.67"
> china_rate<-as.numeric(percentage_without_percent_china)
> decimal_china <- china_rate / 100
> decimal_china
 [1] 0.0245 0.0245 0.0231 0.0245 0.0193 0.0169 0.0169 0.0165 0.0163 0.0166 0.0187 0.0184 0.0198 0.0206 0.0200 0.0194 0.0187 0.0187 0.0175 0.0172 0.0189 0.0173 0.0166 0.0170 0.0171 0.0174 0.0178
[28] 0.0177 0.0171 0.0167 0.0168 0.0176 0.0161 0.0162 0.0167
```

Figure 5. Dimensionless Values of China's Military Expenditure as a Percentage of GDP

Source: Created by the author.

Applying the entropy weight method to determine the weights of "weapon throughput" and "military expenditure proportion."

In the R language interface, the above four groups of data need to be summed, and their probabilities calculated. The algorithm involves summing the data and then dividing each dimensionless value by the total sum to calculate the probability. The code operation is as follows:

The probability of India's weapon throughput is shown in the figure below:

```
p_india_TIV<-normalized_india_TIV/sum(normalized_india_TIV)
p_india_TIV
[1] 0.0089140213 0.0042568549 0.0000000000 0.0076361768 0.0077384611 0.0061071133 0.0047454240 0.0500584707 0.0286408639 0.0291713554 0.0203465373 0.0187508077 0.1659427964 0.0057988419
15] 0.0108700312 0.0678039294 0.0414421613 0.0469940395 0.0774870529 0.0722664561 0.0397433594 0.0275095901 0.0466835617 0.0481973378 0.0347008539 0.0042678871 0.0126088642 0.0143607783
29] 0.0617811337 0.0126972795 0.0110195963 0.0074303474 0.0033188023 0.0001749392 0.0005342739
```

Figure 6. Probability of India's Weapon Throughput

Source: Self-created by the author.

The probability of India's military expenditure as a percentage of GDP is shown in the figure below:

```
> p_india_rate
 [1] 0.03712273 0.03312651 0.03060259 0.02839415 0.02965612 0.02797350 0.02713219 0.02597539 0.02786834 0.02870964 0.03112840 0.03102324 0.03070775 0.02976128 0.02818383 0.02976128 0.03060259
[18] 0.02818383 0.02608056 0.02765801 0.03291618 0.03039226 0.02839415 0.02755284 0.02681670 0.02671154 0.02587023 0.02671154 0.02660637 0.02544957 0.02681670 0.02955095 0.02608056 0.02481859
[35] 0.02565990
```

Figure 7. Probability of India's Military Expenditure as a Percentage of GDP

Source: Self-created by the author.

The probability of China's weapon throughput is shown in the figure below:

```
> p_china_TIV<-normalized_china_TIV/sum(normalized_china_TIV)
> p_china_TIV
 [1] 0.0199159120 0.0259266741 0.0248230154 0.0421830187 0.0235581525 0.0061298685 0.0451328254 0.0599112504 0.0178826336 0.0561635083 0.0630472891 0.0162070592 0.0470835764 0.0591283317
[15] 0.0194047045 0.0310266837 0.0393154826 0.0359866663 0.0041671811 0.0219378958 0.0311694059 0.0167095390 0.0535721757 0.0394315086 0.0162705911 0.0162564729 0.0721243973 0.0100561417
[29] 0.0304726082 0.0130115957 0.0193817304 0.0077044336 0.0144456204 0.0004620504 0.0000000000
```

Figure 8. Probability of China's Weapon Throughput

Source: Self-created by the author.

The probability of China's military expenditure as a percentage of GDP is shown in the figure below:

```
> p_china_rate<-decimal_china/sum(decimal_china)
> p_china_rate
 [1] 0.03797861 0.03797861 0.03580840 0.03797861 0.02991784 0.02619749 0.02619749 0.02557743 0.02526740 0.02573244 0.02898775 0.02852271 0.03069292 0.03193303 0.03100295 0.03007286 0.02898775
[18] 0.02898775 0.02712758 0.02666253 0.02929778 0.02681755 0.02573244 0.02635250 0.02650752 0.02697256 0.02759262 0.02743761 0.02650752 0.02588746 0.02604247 0.02728259 0.02495737 0.02511239
[35] 0.02588746
>
```

Figure 9. Probability of China's Military Expenditure as a Percentage of GDP

Source: Self-created by the author.

Additionally, the information entropy for the four groups of data needs to be calculated. The formula for calculating information entropy (H) is: H = sum(p * ln(p)) / ln(2).

The R language code for this operation is as follows:

After calculation and rounding, the information entropy of India's weapon throughput is -4.384. The code for this operation is shown in the figure below:

```
> H_india_TIV<-as.data.frame(cleaned_data)
> sum(cleaned_data)
[1] -3.038762
> H_india_TIV<-sum(cleaned_data)/log(2)
> H_india_TIV
[1] -4.384007
```

Figure 10. Information Entropy of India's Weapon Throughput

Source: Self-created by the author.

After calculation and rounding, the information entropy of India's military expenditure as a percentage of GDP is -5.124. The code and results are shown in the figure below:

```
> p_india_rate*log(p_india_rate)
 [1] -0.12226466 -0.11287598 -0.10670114 -0.10112782 -0.10433279 -0.10004715 -0.09786675 -0.09482591 -0.09977600 -0.10193423 -0.10800419 -0.10774429 -0.10696247 -0.10459742 -0.10058827
[16] -0.10459742 -0.10670114 -0.10058827 -0.09510445 -0.09923251 -0.11236897 -0.10617741 -0.10112782 -0.09896016 -0.09704241 -0.09676681 -0.09454695 -0.09676681 -0.09649079 -0.09342682
[31] -0.09704241 -0.10406779 -0.09510445 -0.09173354 -0.09398775
> data<-p_india_rate*log(p_india_rate)
> data
 [1] -0.12226466 -0.11287598 -0.10670114 -0.10112782 -0.10433279 -0.10004715 -0.09786675 -0.09482591 -0.09977600 -0.10193423 -0.10800419 -0.10774429 -0.10696247 -0.10459742 -0.10058827
[16] -0.10459742 -0.10670114 -0.10058827 -0.09510445 -0.09923251 -0.11236897 -0.10617741 -0.10112782 -0.09896016 -0.09704241 -0.09676681 -0.09454695 -0.09676681 -0.09649079 -0.09342682
[31] -0.09704241 -0.10406779 -0.09510445 -0.09173354 -0.09398775
> H_india_rate<-sum(data)/log(2)
> H_india_rate
[1] -5.123708
```

Figure 11. Information Entropy of India's Military Expenditure as a Percentage of GDP

Source: Self-created by the author.

After calculation and rounding, the information entropy of China's weapon throughput is -4.792. The code and results are shown in the figure below:

```
> H_china_TIV<-p_china_TIV*log(p_china_TIV)
> H_china_TIV
 [1] -0.077995417 -0.094696735 -0.091745468 -0.133540366 -0.088302631 -0.031229118 -0.139828058 -0.168643638 -0.071958380 -0.161722151 -0.174254524 -0.066810496 -0.143879454 -0.167217588
[15] -0.076497997 -0.107752808 -0.127230283 -0.119641515 -0.022838301 -0.083792665 -0.108105419 -0.068371683 -0.156791050 -0.127489562 -0.067008738 -0.066964705 -0.189641215 -0.046253945
[29] -0.106377654 -0.056495234 -0.076430388 -0.037489460 -0.061211352 -0.003548471           NaN
> sum(H_china_TIV)
[1] NaN
> cleaned_data <- na.omit(H_china_TIV)
> cleaned_data
 [1] -0.077995417 -0.094696735 -0.091745468 -0.133540366 -0.088302631 -0.031229118 -0.139828058 -0.168643638 -0.071958380 -0.161722151 -0.174254524 -0.066810496 -0.143879454 -0.167217588
[15] -0.076497997 -0.107752808 -0.127230283 -0.119641515 -0.022838301 -0.083792665 -0.108105419 -0.068371683 -0.156791050 -0.127489562 -0.067008738 -0.066964705 -0.189641215 -0.046253945
[29] -0.106377654 -0.056495234 -0.076430388 -0.037489460 -0.061211352 -0.003548471
attr(,"na.action")
[1] 35
attr(,"class")
[1] "omit"
> sum(cleaned_data)
[1] -3.321756
> H_china_TIV<-sum(cleaned_data)/log(2)
> H_china_TIV
[1] -4.792282
```

Figure 12. Information Entropy of China's Weapon Throughput

Source: Self-created by the author.

After calculation and rounding, the information entropy of China's military expenditure as a percentage of GDP is -5.118. The code and results are shown in the figure below:

```
> H_china_rate<-p_china_rate*log(p_china_rate)
> H_china_rate
 [1] -0.12421786 -0.12421786 -0.11922668 -0.12421786 -0.10499069 -0.09541366 -0.09541366 -0.09376801 -0.09293957 -0.09418082 -0.10264221 -0.10145684 -0.10692563 -0.10998102 -0.10769410
[16] -0.10537927 -0.10264221 -0.10264221 -0.09785472 -0.09663824 -0.10342831 -0.09704463 -0.09418082 -0.09582276 -0.09623096 -0.09745012 -0.09906322 -0.09866126 -0.09623096 -0.09459269
[31] -0.09500363 -0.09825843 -0.09210733 -0.09252393 -0.09459269
> sum(H_china_rate)
[1] -3.547635
> H_china_rate<-sum(H_china_rate)/log(2)
> H_china_rate
[1] -5.118155
```

Figure 13. Information Entropy of China's Military Expenditure as a Percentage of GDP

Source: Self-created by the author.

(5) Calculation of Weighted Entropy

Weighted entropy represents the weights derived from the four information entropy results mentioned above. The calculation formula is:

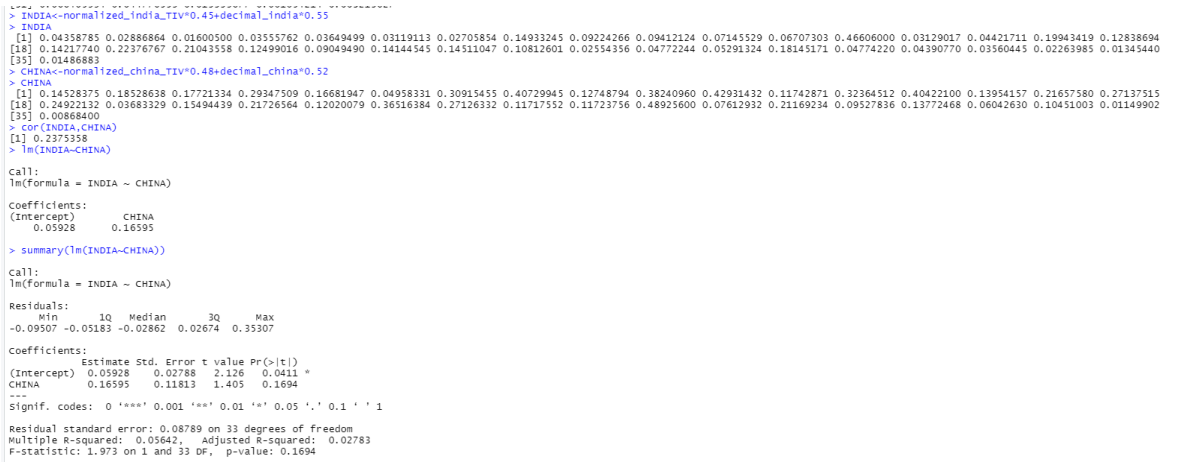
Weight = (1 - H) / sum(1 - H).

After rounding, it can be observed that for India, the weight of weapon throughput is 45%, while the weight of military expenditure proportion is 55%. For China, the weight of weapon throughput is 48%, and the weight of military expenditure proportion is 52%.

(6) Comprehensive Data Calculation and Correlation Analysis

After completing the weight calculations, the comprehensive data for India and China can be calculated using the weighted average method, followed by correlation analysis. The code for this operation is shown in the

figure below:



```
> INDIA<-normalized_india_TIV*0.45+decimal_india*0.55
> INDIA
 [1] 0.04358785 0.02886864 0.01600500 0.03555762 0.03649499 0.03119113 0.02705854 0.14933245 0.09224266 0.09412124 0.07145529 0.06707303 0.46606000 0.03129017 0.04421711 0.19943419 0.12838694
[18] 0.14217740 0.22376767 0.21043558 0.12499016 0.09049490 0.14144545 0.14511047 0.10812601 0.02554356 0.04772244 0.05291324 0.18145171 0.04774220 0.04390770 0.03560445 0.02263985 0.01345440
[35] 0.01486883
> CHINA<-normalized_china_TIV*0.48+decimal_china*0.52
> CHINA
 [1] 0.14528375 0.18528638 0.17721334 0.29347509 0.16681947 0.04958331 0.30915455 0.40729945 0.12748794 0.38240960 0.42931432 0.11742871 0.32364512 0.40422100 0.13954157 0.21657580 0.27137515
[18] 0.24922132 0.03683329 0.15494439 0.21726564 0.12020079 0.36516384 0.27126332 0.11717552 0.11723756 0.48925600 0.07612932 0.21169234 0.09527836 0.13772468 0.06042630 0.10451003 0.01149902
[35] 0.00868400
> cor(INDIA,CHINA)
[1] 0.2375358
> lm(INDIA~CHINA)

Call:
lm(formula = INDIA ~ CHINA)

Coefficients:
(Intercept)        CHINA
    0.05928      0.16595

> summary(lm(INDIA~CHINA))

Call:
lm(formula = INDIA ~ CHINA)

Residuals:
      Min        1Q    Median        3Q       Max
-0.09507 -0.05183 -0.02862  0.02674  0.35307

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.05928    0.02788   2.126   0.0411 *
CHINA        0.16595    0.11813   1.405   0.1694
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.08789 on 33 degrees of freedom
Multiple R-squared:  0.05642,   Adjusted R-squared:  0.02783
F-statistic: 1.973 on 1 and 33 DF,  p-value: 0.1694
```

Figure 14. Comprehensive Data Values and Correlation Analysis for India and China

Source: Self-created by the author.

Ultimately, it can be concluded that the two sets of comprehensive data for India and China exhibit a positive correlation, albeit with a weak degree of correlation, as indicated by a correlation coefficient of only 0.237.

5. Conclusion

If India views China as its greatest military threat, then India should respond immediately when there are changes in China's military defense investments. The comprehensive data reflecting the importance each country places on military defense should show a strong positive correlation. However, in reality, the importance that China and India place on military defense only shows a weak positive correlation, indicating that India does not genuinely perceive China as a military threat.

Following this conclusion, several directions for further research can be explored. For instance, given that India does not actually consider China a military threat, why has India repeatedly initiated conflicts along the Sino-Indian border? Why has India referred to China as its "imaginary enemy" in military terms? Can India's strategic culture explain its statements and behaviors? Additionally, how should China properly manage its relationship with India? These questions can serve as a foundation for deeper investigation in this area.

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