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Reconsidering economic sanctions reconsidered
A detailed analysis of the Peterson Institute sanction database

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Table of Contents

ABSTRACT 4

1 INTRODUCTION 5

2 CHANGES AND MODIFICATIONS BETWEEN THE EDITIONS 7
- 2.1 Reflection on changes in economic and political variables 9
- 2.2 Splitting cases 10
- 2.3 Changes in the core variables for the success score 10
- 2.4 Changes in political variables 13
- 2.5 Changes in economic variables 14
- 2.6 Changes in identified foreign policy objectives 15

3 COMPARISON OF SUMMARY STATISTICS: CORE, POLITICAL AND ECONOMIC VARIABLES 15
- 3.1 Changes in the core variables 16
- 3.2 Changes in the political and economic variables 16

4 COMPARISON OF COMMON CASES VERSUS FULL SAMPLE 17
- 4.1 Comparison of foreign policy goals 17
- 4.2 Success ratio analysis: common versus full sample 19
  - 4.2.1 Success ratio by foreign policy goals 19
  - 4.2.2 Successes of the core and political variables 19
  - 4.2.3 Success ratio by economic variables 20

5 DETERMINANTS OF SUCCESS OF THE ECONOMIC SANCTIONS 21
- 5.1 Determinants of success of the core, political and economic variables 22
- 5.2 Determinants of success by foreign policy goals 23
- 5.3 Determinants of success by political variables 24
- 5.4 Determinants of success of the foreign policy goals by economic variables 27
- 5.5 Econometric modelling for the determinants of success of the foreign policy goals 29

6 CONCLUSION 32

REFERENCES 35

APPENDICES 36

ABSTRACT

This paper analyses two vintages of the key resource for research on economic sanctions: the Peterson Institute database reported in Hufbauer et al. (2nd edition in 1990 and 3rd edition in 2007). The Peterson Institute has not reported transparently on these changes.

We provide detailed tables in order to facilitate comparison between descriptive statistics and the findings of the two editions. One way to interpret our results is as are porting of the 2nd edition results corrected for changes in methodology and case selection.

Using descriptive statistics, ratio analysis, first-difference method and probit we investigate how case selection, (re)coding and new observations impacted on sanction characteristics and assumed effectiveness of economic sanctions.

About 17% of the common cases of the 2nd and 3rd edition is modified and changed to some extent. The number of goals assigned to these cases increased from 146 to 155. The average success score increases from 6.6 to 7.0 for the common cases. Indeed, the mean values for all categories of core variables for the common cases in the 3rd edition exceed those reported in the 2nd edition. A redefined index value of the 'sanction contribution' underlies these changes. The lowest value index is defined as zero or negative contribution in the in 2nd edition whereas is limited to negative contribution in the 3rd edition (upgrading all zero contributions by definition) Likewise 'modest and significant contribution' is used in the 3rd edition instead of 'substantial and decisive contribution', making it easier to get a high score. We provide a probit analysis that shows that the 3rd edition's methodology in comparison to the methodology used in the 2nd edition is biased in favour of finding positive results for modest policy change, regime change and the use of sanctions to disrupt military adventures and to achieve military impairment.

Keywords

Economic sanctions, change, modifications, mean difference, success ratios and the determinants of economic sanctions.

Reconsidering economic sanctions reconsidered
A detailed analysis of the Peterson Institute sanction database

1 Introduction

This working paper analyses the development of different vintages of the Peterson Institute database on international economic sanctions. The Peterson Institute database is the most important database on the use and effectiveness of economic sanctions and it is a generally accepted source amongst students of economic coercion. This does not mean that the dataset is beyond all doubts. Indeed it has been criticised by many authors. Prominent amongst these critics is Pape (1997) who is often misquoted for having established that the failure rate of sanctions is 95%[1]. Notably, other authors have also recognized problems with the assessments in the Peterson Institute database. An example is van Bergeijk's (1994 and 2009) assessment:

> As each outcome is the result of an evaluation of the literature on a specific case, it seems probable that differences of opinion exist about the value of the dependent variable in certain cases. Hufbauer et al. for example, code the British sanctions against Argentina in 1982 as relatively successful in removing Argentinean forces from the Falklands, whereas the Royal Marines would seem more deserving of the credit.

This working paper, however is not about these manners of critiques. We take both individual case assessments and the selection of cases for granted. We simply want to investigate if (and if yes, how) the Peterson Institute researchers have changed their methodological minds and in addition how the new cases that have been collected since the 1990s change our perspective on the efficacy and effectiveness of economic sanctions as a tool for foreign policy. Our research question, in a nutshell, concerns the following issues

- (How) did the methodology change between the different editions of the Peterson Institute's report on its sanction database?
- (How) did this influence key statistics?
- (How) do recently collected data (i.e. post 1990) differ from pre 1990 observations?

Following the seminal publication of Hufbauer and Schott in 1985 two major new editions have been published so that we now have three vintages of this dataset (Hufbauer et al., 1985, 1990 and 2007). This database is the major empirical resource dealing with the occurrence and effectiveness of

[1] Pape (1997) proposes that only 5cases meet his criteria of successful sanctions. However, this does not imply that the success rate is only five per cent, since the success rate is a ratio and Pape's arguments relate to both the numerator and the denominator. Using Pape's definitions on what sanctions should not be included reduces the population of relevant sanctions to 44 so that the success rate is at least 11% if one completely accepts Pape's verdicts on successes and failures.

international economic sanctions as a tool of foreign policy. Hufbauer et al. have neither documented nor motivated changes in methodology, case selection and judgments and this complicates comparison of results of studies that are based on the different vintages of the database. This working paper sets a first step at a better understanding of how the rules of measurement may impact analyses of sanction by taking a close look at the apparent changes in methodology, episode, case selection and evaluation between the 2nd and 3rd (most recent) editions.

Table 1 reports that the number of sanction episodes increases from 103 to 174 cases in the 3rd edition. Some sanction episodes are split into a number of cases and the number of cases increases from 108 to 205 in the 2nd and 3rd editions, respectively. Consequently, the issue whether to analyse episodes or cases thus has become much more important in the 3rd edition.

Table 1
Economic sanctions considered in the second and third editions

Edition	No of episodes	Cases (including split)	Coverage
Second	103	108	1914-1984
Third	174	205	1914-2000
Increase	68.9%	89.8%	22.5%

Economic sanctions itself have a long history. Starting in ancient Greece, economic sanctions have been used as diplomatic instruments in the pursuit of foreign policy goals. The study by Hufbauer et al. (1985) and subsequent editions describe and analyze the rich history of the use of economic sanctions in the 20th and 21th century in order to provide a recipe for the 'success' for the attainment of certain foreign policy goals. The 2ndedition (Hufbauer, Schott and Elliott) considers 103 episodes of economic sanctions starting from the economic blockade of Germany during World War I to the economic sanctions imposed by the United States and organization of Eastern Caribbean States on Greneda. The list of episodes considered in the 2ndedition does not include all instances since World War I: the information used in the second edition omitted many uses of economic sanctions imposed between powers of the second and third rank as they were insufficiently documented in the English language and some instances may have been overlooked if the sanctions were imposed by the major powers in comparative secrecy to achieve relatively modest goals.

In the 3rdedition of *Economic Sanctions Reconsidered* by Hufbauer, Schott, Elliott and Oegg (2007), 174 episodes of economic sanctions are considered. Considering the facts of economic and political variables by foreign policy goals up to 1983, a total of 108 cases were considered in the 2ndedition of which 3 cases were deleted (the appear only in the 2nd edition and not in the 3rd edition). So, 105 common cases are analyzed in both 2nd and 3rd editions. The other 100 cases of economic sanctions are completely new and of course analyzed only in the 3rd edition.

A detailed analysis of the two editions revealed that for the common cases the description and evaluation often differ regarding sanction goals, senders, targets and economic and political variables. The motivation for our working paper is that the 3rd edition does not report these modifications in the methodology and changes. This implies that research based on the 2nd and 3rd edition will not only differ because new cases have been added, but also due to the underlying shift in methodologies. Typically this is important when new results emerge or when the robustness of findings is an issue. We have constructed a data set for both editions and use this new data set to analyze the changes and modifications in the 3rd edition *vis-à-vis* the 2nd edition. We start by analysing the common 101 cases. Then we take a look at how splitting cases has an impact. We also assess how the information on the explanatory political and economic variables changed between the editions and for generalization of the changes and modifications, report changes in the averages of the economic and political variables. *One way to interpret our results is as the reporting of results of the 2nd edition corrected for changes in methodology and case selection.*

The remainder of this paper is constructed as follows. Section 2 elaborates on the changes and modifications of the episodes and cases of economic sanctions. Section 3 reports summary statistics of the core political and economic variables for the common cases of 2nd and 3rd editions. Success ratios of these variables are analysed in-depth in section 4 in order to look at the changes and modifications between the common and full sample in the 3rd edition. Section 5 presents single-difference and probit model estimation for the effectiveness of economic sanctions. The final section draws conclusions

2 Changes and modifications between the editions

This section reports on differences between the 2nd and 3rd editions with respect to the sanction goals, principal sender(s), target(s) and economic and political variables for sanctions in the 1914-1984 periods.

New and deleted episodes

Two episodes are no longer in the 3rd edition: the dropped episodes are 65-4 (US versus Arab League) and 73-3 (US versus Chile). The goal of sanction case 65-4 is to stop US firms from cooperating with the Arab boycott of Israel and the sanction goal of 73-3 is to improve human rights in Chile (the first two digits of the sanction case refer to the year that the sanction was implemented; the final digit is an identifier; so 65-4 is the 4th sanction case in 1965). The deletion of the episodes has not been motivated.

The new episodes that are incorporated in the 3rd edition, within the time periods considered for 2nd edition, are 71-2 and 77-8. The United States is the principal sender for the first newly added episode and its target is Malta and aims at reinstituting a defense agreement. For the second episode, the principal sender is also the US and Ethiopia is the target. In case 77-8, two goals are set: to settle expropriation claims and to improve human rights.

Goals

For some episodes in the 3rd edition Hufbauer et al. added new goals and/or modified and changed some of the stated goals in the 2nd edition. For example, two goals are report in case of 76-3 in the 2nd edition: *in casu* to settle expropriation claims and to improve human rights. In the 3rd edition the goal becomes anti-boycott restrictions on US firms. The conclusion is, therefore, that two goals are dropped and one new goal is added in the 3rd edition. In the 2ndedition, a total of 146 goals were set for 101 episodes. The number of goals is raised to 155 in the 3rd edition for the same 101 episodes and this increases the average number of goals per episode from 1.45 to 1.53 in the 3rd edition. Detailed findings are reported in Table 2.

In fiveepisodes the principal sender or target are either changed or modified. An example is case 82-2: the Netherlands and United States are the principal senders in the 2ndedition, but only the Netherlands is in the 3rd edition. Table 3 provides details.

Table 2
Changes regarding number of goals for the common cases

Case ID	Sender	Target	No of goals		No of goals deleted	No of goals added
			2nd	3rd		
50-1	United States and United Nations	North Korea	1	2	1	2
54-4	United States, South Vietnam	North Vietnam	2	5	-	3
63-1	United States	United Arab Republic	2	1	1	-
75-3	United States	Eastern Europe	1	2	1	2
76-3	United States	Ethiopia	2	1	2	1
78-8	United States	Libya	2	3	-	1
80-2	United States	Iraq	1	2	-	1
82-2	Netherlands and United States	Suriname	2	3	-	1
82-3	South Africa	Lesotho	1	2	-	1
83-3	United States	Zimbabwe	1	3	-	2

Table 3
Changes of principal sender and target

Case ID	2nd edition	3rd edition
Principal sender		
39-1	Alliance Powers	Alliance Powers, US
61-3	Western Allies	US, Western Allies
82-2	Netherlands and US	Netherlands
Target		
56-3	UK, France	UK
76-3	Ethiopia	Arab League

Source: Authors' findings from new dataset constructed from Hufbauer et al. (1985 & 2007)

2.1 Reflection on changes in economic and political variables

Table 4lists the political variables are considered in the 2nd edition (6 items) and the 3rd edition (9 items). The health and stability index is dropped in the 3rd edition from the list of political variables an instead is considered to be an economic variable. Four new political variables cover cooperating international organizations, the regime of target (democracy/autocracy) and political relations (prior and during).

Table 4
List of political variables

Political variables in the 2nd edition	Political variables in the 3rd edition
Companion policies	Companion policies
International cooperation with sender (index)	International cooperation with sender (index)
International assistance to target	International assistance to target
Sanctions period (years)	Duration of sanctions (years)
Health and stability (index)	-
Prior relations (index)	Prior relations (index)
-	Cooperating international organizations
-	Regime of target
-	Political stability prior
-	Political stability during

Table 5lists the economic variables in the 2nd and 3rd editions. The changes are that 'health and stability', which was considered as political variable in the 2nd edition, is now considered to be 'economic' rather than 'political' and that GDP growth and inflation are added.

Table 5
List of economic variables

2nd edition	3rd edition
Cost to target (million dollars)	Cost to target (million dollars)
Cost as percentage of GNP	Cost as percentage of GNP
Cost per capita	Cost per capita
Trade linkage (%)	Trade linkage (%)
GNP ratio: sender to target	GNP ratio: sender to target
Type of sanction	Type of sanction
Cost to sender (index)	Cost to sender (index)
-	Health and stability
-	GDP growth rate
-	Inflation rate

2.2 Splitting cases[2]

This section concerns the cases that are split into sub-cases in the 3rd edition. Splitting cases increases the number of observations to 108 in the 2nd edition (3 of which are considered only in the 2nd edition; the other 105 cases are considered and analyzed in both editions). The split cases are 32-1, 39-1, 48-3, 71-1, 73-1 and 77-4. Table 6 shows details. The split is made to disaggregate the economic and political variables for different country contexts.

Table 6
Details of split cases

Case ID in the 2nd edition	Case ID in the 3rd edition	Sender in 2nd edition	Sender in 3rd edition	Target in 2nd edition	Target in 3rd edition	Changes made in 3rd edition
32-1	32-1(1)	League of Nations	League of Nations	Paraguay and Bolivia	Paraguay	Both political and economic variables
	32-1(2)				Bolivia	
39-1	39-1(1)	Alliance powers	Alliance powers	Germany, later Japan	Germany	Both political and economic variables
	39-1(2)		USA		Japan	
48-3	48-3(1)	USSR	USSR	USA, UK. France	USA	Both political and economic variables
	48-3(2)				UK	
	48-3(3)				France	
71-1	71-1 (1)	USA	USA	India and Pakistan	Pakistan	Both political and economic variables
	71-1 (2)				India	
73-1	73-1(1)	Arab League	Arab League	USA, Netherlands	USA	Both political and economic variables
	73-1(2)				Netherlands	
77-4	77-4 (1)	Canada	Canada	Japan, EC	EC	Both political and economic variables
	77-4(2)				Japan	

2.3 Changes in the core variables for the success score

This section considers the three core variables that are widely used for measuring the effectiveness of economic sanctions:

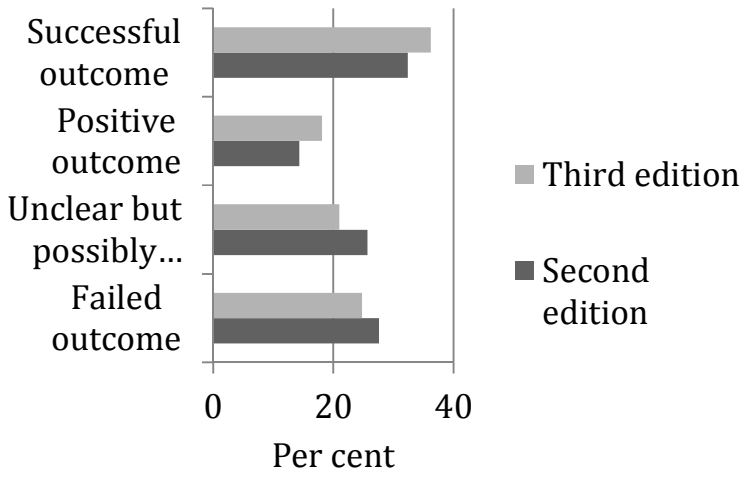
- the policy result index,
- sanction contribution index and
- the success score (policy result multiplied by sanction contribution).

[2] The consideration of economic and political variables by foreign policy goals gives rise to the number of cases due to the split.

We use the common 105 cases including the split to analyze changes in the assessments of policy result, sanction contribution and success score, also in relation to political and economic explanatory variables. Policy result comprises

- failed,
- unclear but possibly positive,
- positive and
- successful outcomes.

Figure 1
Changes in the policy result (% of cases, N = 105)



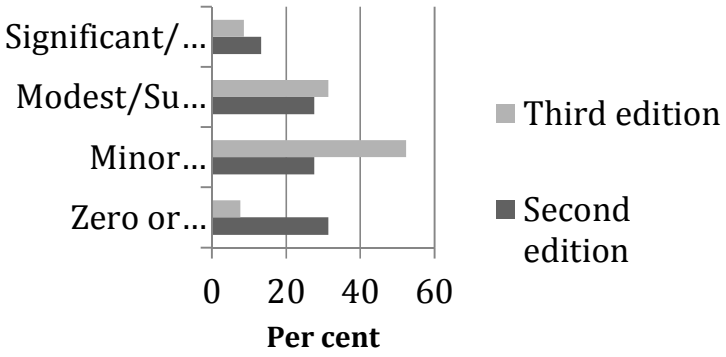
From this perspective it is important to note that Hufbauer et al. (2007) appear to have changed the methodology for assessing the sanction contribution. For example, the lowest score (1) was assigned to 'zero or negative' contribution' in the 2nd edition, but in the 3rd edition the lowest score is attributed to 'negative' contributions only so that a zero contribution would score '1' in the 2ndbut'2' in the 3rd edition. Likewise the highest score in the 3rd edition is assigned to 'substantial and decisive' where the top contribution category was 'modest and significant' contributions in the 2nd edition respectively (Table 7).

Table 7
Reflection on changes regarding the contribution of economic sanctions

Index value	Contribution in the 2nd edition	Contribution in the 3rd edition
1	Zero or negative	Negative contribution
2	Minor	Minor
3	Modest	Substantial
4	Significant	Decisive

Figure 2 and Table A.2 report how the new scales for the sanction contribution influence the results. The share of the bottom category reduces from 31% to 8% and the share of 'minor contributions' almost doubles to 52%. The consequence of the new scaling is that the share of extreme cases with a contribution score of 1 and 4 reduces from 45% to 16%.

Figure 2
Reflection of changes regarding contribution



Also the success score change between the two editions. For the common cases, the average success scores are 6.6and7.0 for the 2nd and 3rd edition, respectively. The average success score increased and the standard deviation decreased, but the mean difference of the success score for the common cases in the 2nd and 3rd edition is not statistically significant (Table 8).

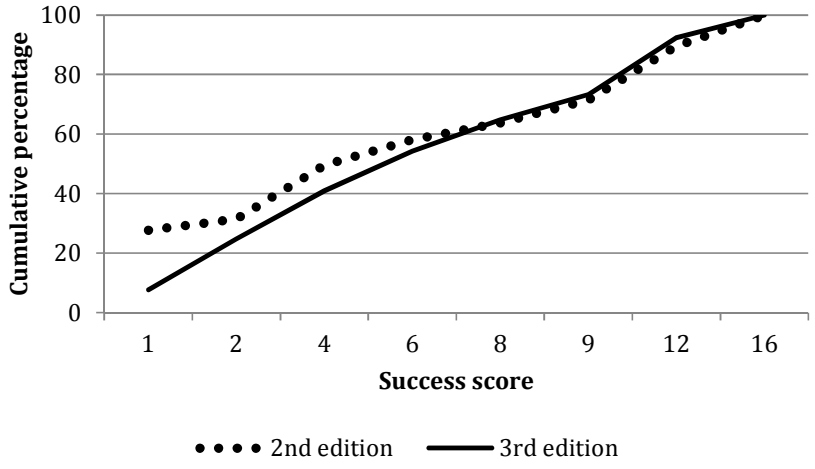
Table 8
Comparison of success score

Edition	Mean	Standard deviation
2nd edition	6.6	5.1
3rd edition	7.0	4.5
N=105		

Source: Authors' findings from new dataset.

The cumulative frequency distribution of the success score in Figure 3shows the noteworthy changes for the success scores. Interestingly, the lines for the cumulative percentage distribution for the 2nd and 3rd editions cross at a success score of 8, the traditional cut off value for failure.

Figure 3
Cumulative frequency distribution of success score



Note: No success score of 3 exists in the data set.

2.4 Changes in political variables

This section focuses on the changes in some political variables comparing the findings between the editions with respect to companion policies, support for and pre-sanction interaction between target and sender. Table 9 reports on companion policies and provides details for the 7 dropped cases and the 3 added cases in the 3rd edition (see also Table A.3).

Table 9
Changes in the companion policies

Case ID	Companion policies		Changes in the 3rd edition
	2nd edition	**3rd edition**	
44-1	Quasi-military operation	-	Dropped
49-1	Quasi or regular military action	-	Dropped
54-2	-	Regular military action	Added
54-4	Regular military action	-	Dropped
60-31	Quasi-military or covert action	-	Dropped
61-3	-	Quasi-military operations	Added
71-1	Quasi-military operations	-	Dropped
80-2	Covert action	-	Dropped
81-1	-	Quasi-military or covert action	Added
82-2	Covert action	-	Dropped

The Hufbauer et al. view on international cooperation with the sender changes only marginally between editions (Table A.4) but their view on international assistance to target changed: the 2nd edition identifies international assistance to the target in 25.7% of the 105 common cases, but in the 3rd edition, this

reduces to 21.9%. Changes with respect to prior relations between target and sender occur in 60-3, 60-3(1), 75-3, 75-4, 75-5 and 76-3. Table A.5).

Duration of sanctions changes to a great extent in the 3rd edition but this is not due to changes in methodology and simply reflects the sanctions that were ongoing in 1990 (the cut-off point of the 2nd edition) so that average duration for the common cases increased from 5.3 to 7.1 years in the 3rd edition.

2.5 Changes in economic variables

Table 10
Comparison of types of sanction

Sanction type	2nd edition		3rd edition	
	No of cases	% of cases	No of cases	% of cases
M	3	3.1	3	3.1
F,M	6	6.1	3	3.1
F,X	11	11.2	13	13.3
F	26	26.5	25	25.5
F,X,M	31	31.6	33	33.7
X	16	16.3	17	17.3
X,M	5	5.1	4	4.1
Total	98	100	98	100

Here we discuss changes in identified type of sanctions, cost to sender and health and stability. The type of sanction refers to the interruption of commercial finance, aid and other official finance (F), interruption of exports from the sender country to the target country (X), interruption of imports by the sender country from the target country (M) and combinations (Table 10).

Table 10 reports the common 98 cases though we find 100 cases in the 2nd edition. The two missing cases only in the 3rd edition are 65-1 and 78-2. The common missing cases in both editions are 21-1, 25-1, 61-3, 62-2 & 75-1.

Table11
Cost to sender and health and stability of target (N = 105)

Economic variables	2nd edition (% of cases)	3rd edition (% of cases)	Change (% points)
Cost to sender			
Net gain to sender	32.4	30.5	-1.9
Little effect on sender	45.7	47.6	1.9
Modest welfare loss to sender	17.1	16.2	-0.9
Major loss to sender	4.8	5.7	0.9
Health and stability			
Distressed country	17.1	18.1	1
Country with significant problems	42.9	44.8	1.9
Strong and stable country	40.0	37.1	-2.9
N=105			

Table 11 compares two variables measured with an index scale: cost to the sender and health and stability of the target economy. Typically, Hufbauer et al in the 3rd edition see less sender countries that actually gain from the sanctions and a somewhat higher level of instability than in the 2nd edition.

2.6 Changes in identified foreign policy objectives

There are five major types of foreign policy objectives identified for the sanctions episodes. The foreign policy goal categories are

- modestchanges in target-country policies,
- destabilization of target government/democratization,
- disruption of military government other than major wars,
- impairment of military potential including major wars and
- other major changes in the target country.

Major changes have occurred with respect to the attribution of foreign policy goals to sanction episodes.

Table12
Comparison of foreign policy goals (N = 105)

Groups of foreign policy goals	2nd (%)	3rd (%)
Modest changes in target-country policies	41.0	21.0
Destabilization of target government/democratization	18.1	34.3
Disruption of military government other than major wars	16.2	12.4
Impairment of military potential including major wars	9.5	16.2
Other major changes in the target country	15.2	16.2
N=105		

Table 12 illustrates that in the 2nd edition, 41% cases are considered to aim at modest policy changes in the target country whereas it is only 21% in the 3rd edition. This appears to reflect a re-evaluation of the importance of destabilizing government or democratization. Interestingly also the judgement changes with regard to 'disruption of military government other than major wars' versus 'impairment of military potential including major wars'. All in all a very substantial change occurs in the distribution of the common cases of economic sanctions by foreign policy goals.

3 Comparison of summary statistics: core, political and economic variables

This section reflects the changes using summary statistics in order to compare between the editions. First of all, it focuses on the changes in the core variables. Then we consider the changes in the political and economic variables respectively.

3.1 Changes in the core variables

The core variables are indices for policy result, sanction contribution and the success score. The success score is the product of policy result and sanction contribution and assumes the values of 1, 2, 3, 4, 6, 8, 9, 12 and 16. Table 13 reports the distribution of the success score for the common cases in the 2nd and 3rd edition, respectively. The share of successes (with a score of 9, 12 or 16) remains at a stable around 36%. The share of complete *e.g.,* significant failures decreases sharply reflecting the methodological changes discussed earlier. As a result on average policy result, sanction contribution and success score increase (Table 14). Since the distribution shifts up while the maximum score remains at it is, the standard deviations for sanction contribution and success score in the 3rd edition are reduced by definition.

Table 13
Frequency distribution of success score

Success score	2nd edition		3rd edition	
	Frequency	% of cases	Frequency	% ofcases
1	29	27.6	8	7.6
2	4	3.8	18	17.1
4	19	18.1	17	16.2
6	9	8.6	14	13.3
8	6	5.7	11	10.5
9	8	7.6	9	8.6
12	19	18.1	20	19.1
16	11	10.5	8	7.6
Total	**105**	**100**	**105**	**100**

Note: No success score of 3 exists in the data set.

Table 14
Comparison of summary statistics of the core variables

Variables	No of cases	2nd edition		3rd edition	
		Mean	SD	Mean	SD
Core variables					
Policy result	105	2.5	1.2	2.7	1.2
Sanction contribution	105	2.23	1.0	2.4	0.8
Success score	105	6.6	5.1	7.0	4.7

3.2 Changes in the political and economic variables

Table 15 summarizes the average indicators for political and economic variables in the 2nd and 3rd edition. The set of political variables changes simply too much to make a sensible comparison in this respect. In comparing the economic variables it is important to note that the data are often in current prices and at current exchange rates so that comparison over time is compromised by inflation and exchange rate volatility (van Bergeijk 1989). The appropriate measures for comparison are therefore costs in per cent of GNP

and trade linkage which both are slightly but not significantly lower in the 3rd edition. GNP ratio sender to target is at a comparable level.

Table 15
Comparison of summary statistics of the political and economic variables

Variables	No of cases	2nd edition		3rd edition	
		Mean	SD	Mean	SD
Political variables					
International cooperation	105	1.97	1.08	1.96	1.08
Duration (in years)	105	5.3	7.6	7.1	10.1
Health and stability	105	2.23	0.72	-	-
Prior relations	105	2.09	0.72	2.07	0.72
Regime of target	101	-	-	1.75	0.82
Prior political stability	101	-	-	0.13	0.21
Political stability during	101	-	-	0.06	0.17
Economic variables					
Cost to target (million $)	96 (94)	207	681	218	566
Cost as a % of GNP	79 (93)	1.8	3.2	1.7	3.1
Cost per capita	94 (93)	9.1	27.4	11.4	34.0
Trade linkage (%)	102 (103)	22.6	21.1	22.0	20.7
GNP ratio (sender to target)	105 (104)	554	3241	548	3251
Cost to sender	105	1.9	0.8	2.0	0.8
Health and stability	105	-	-	2.2	0.7
GDP growth rate	93	-	-	4.3	3.0
Inflation	74	-	-	22.8	44.0

Note: Number in the parentheses implies the cases in the 3rd edition only.

4 Comparison of common cases versus full sample

In this section we change the methodology in order look at the changes between the editions from a different perspective. We are now comparing the common cases (covered in both editions) with the full sample. For these common cases, we use the data from the 3rd edition. The full sample considers all 205 cases in the 3rd edition based on economic and political variables by foreign policy goals. This comparison tells us how the recent post 1990 cases change conclusions on characteristics and outcome of economic sanctions.

4.1 Comparison of foreign policy goals

Table 16 and figure 4 show the changes in the distribution of the common and full sample. It shows that about 34% of the common cases aim at regime change and democratization and 39% in the full sample. The shares of disruption of military adventure and military impairment as foreign policy goals of economic sanctions decline.

The distribution of failure cases by foreign policy goals is shown in Table 17, indicating an increase for regime change and democratization at the expense of all other categories, see Figure 4.

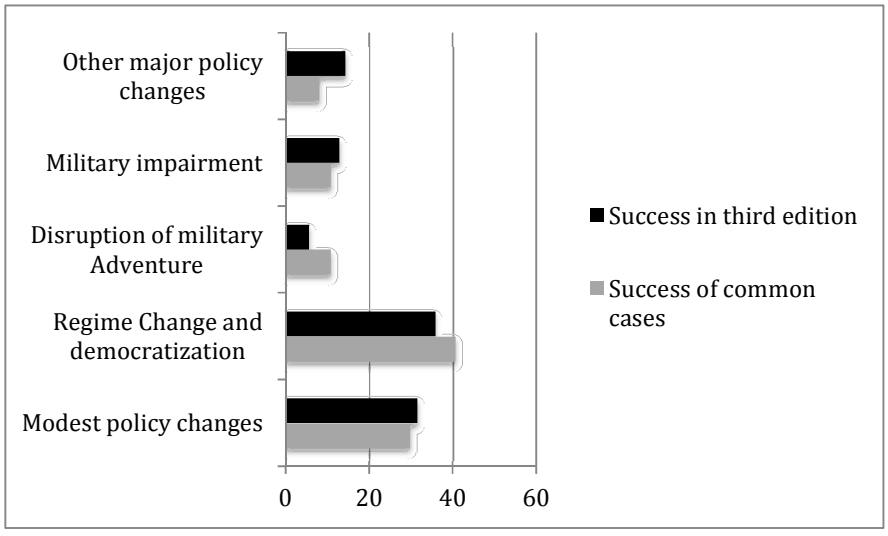
Table 16
Comparison of foreign policy goals

Foreign policy goals	Common cases		Full sample	
	Cases	%	Cases	%
Modest policy changes	22	21.0	43	21.0
Regime Change and democratization	36	34.3	80	39.0
Disruption of military Adventure	13	12.4	19	9.3
Military impairment	17	16.2	29	14.1
Other major policy changes	17	16.2	34	16.6
Total	**105**	**100**	**205**	**100**

Table 17
Comparison of failure cases by foreign policy goals

Foreign policy goals	Common cases		Full sample	
	Failure cases	%	Failure cases	%
Modest policy changes	11	16.2	21	15.6
Regime Change and democratization	21	30.9	55	40.7
Disruption of military Adventure	9	13.2	15	11.1
Military impairment	13	19.1	20	14.8
Other major policy changes	14	20.6	24	17.8
Total	**68**	**100**	**135**	**100**

Figure 4
Comparison of success by foreign policy goals
(total population versus common cases)



4.2 Success ratio analysis: common versus full sample

This section uses ratio analysis to look at how the ratios of the core, political and economic variables change due to the post 1990 cases. The success ratio is defined as the proportion of success cases to the total cases for each particular foreign policy goal. In addition, we also measure the overall success ratio.

4.2.1 Success ratio by foreign policy goals

Table 18
Comparison of success ratio by foreign policy goals

Foreign policy goals	Success ratio	
	Common cases	Full sample
Modest policy changes	50	51
Regime Change and democratization	42	31
Disruption of military Adventure	31	21
Military impairment	24	31
Other major policy changes	18	27
Total	**35**	**34**

Note: Detailed findings are reported in table A.7.

Table 18 shows that the success ratio differs substantially with respect to the foreign policy goals. For example, the success ratio for the common cases is 42% for regime change and democratization whereas it is 31% in the full sample. For military impairment an increase occurs. Detailed findings are reported in table A.7.

4.2.2 Successes of the core and political variables

Table 19 reports success to failure ratios of the core and political variables Success ratios differ only among the components of companion policies.

The success ratio of the regular military action is about 31%, which is below the success ratio of the core variable, but in the full sample, it is around 33%. In terms of prior relation to the target, cordial prior relationship is associated with higher success ratio in both categories though it is higher for the common cases. International assistance to target reduces the success ratio as it is lower than the overall success ratio. Substantial change is found in the success ratio for cooperating international organization as it is 50% and 37% around for the common and full sample respectively. This study finds that duration or length of economic sanction is very important for effectiveness as above average duration is associated with an almost halving of the success ratio.[3] Table A.8 shows the detailed findings.

[3] Compare Van Bergeijk and Van Marrewijk 1995 and Dizaji and van Bergeijk 2012.

Table 19
Comparison of success ratios of core and political variables

Variables	Common cases	Full sample
Core variable		
Success score	35.2	34.3
Political variables:		
Companion policies		
Regular military action	30.8	33.3
Quasi-military operation	37.5	21.1
Covert action	62.5	55.6
International cooperation		
No cooperation	40.0	41.0
Minor cooperation	31.8	17.0
Modest cooperation	30.0	37.0
Significant cooperation	30.8	39.3
Prior relation		
Antagonistic	12.5	18.8
Neutral	36.0	33.3
Cordial	51.6	46.4
Regime of target		
Autocracy	28.6	26.1
Democracy	45.8	48.0
Others		
International assistance to target	26.1	20.5
Cooperating international organization	50.0	36.6
Duration less than or equal average	39.2	39.5
Duration greater than average	23.1	21.1

4.2.3 Success ratio by economic variables

This section identifies the impact of economic variables focusing on how the success ratios vary between the common and full sample in the 3rd edition (Table 20). The detailed findings of the ratio analysis are reported in table A.9.

It should be noted again that the measurement of these variables is not correct in Hufbauer et al. editions since trade and inflation will be influenced by economic sanctions and should therefore be measured prior to the sanctions, per capita costs should be expressed at constant prices, etc. Also the choice of economic variables is not always appropriate. For example, potential costs would seem to be more relevant than actual costs.

Table 20
Comparison of success ratios of economic variables

Variables	Common cases	Full sample
Health and stability		
Distressed	68.4	42
Significant problems	34.0	34
Strong and stable	20.5	26
Health and stability overall	35.2	34
Sanctions type		
Financial and export or import	32.7	32
Export or import or both	20.8	25
Only financial	48.0	36
Overall of sanction type	33.7	32
Cost to sender		
Net gain to sender	46.9	41
Little effect on sender	34.0	31
Modest loss	23.5	31
Major loss	16.7	30
Cost to sender overall	35.2	34
Cost to target		
Cost as a % of GNP (<= average)	31.3	29
Cost as a % of GNP (>average)	46.2	46
Cost per capita (<= average)	29.9	30
Cost per capita (>average)	62.5	52
Trade		
Trade linkage (<= average)	29.5	32
Trade linkage (> average)	45.2	40
Trade linkage overall	35.9	35
GNP, GDP and Inflation		
GNP ratio (<=average)	34.4	35
GNP ratio (>average)	42.9	26
GDP growth (<=average)	37.5	35
GDP growth (>average)	35.6	36
Inflation (<=average)	44.1	37
Inflation (>average)	40.0	53

5 Determinants of success of the economic sanctions

This section focuses on the determinants of success of the economic sanctions based on the mean difference test (independent sample t-tests, which helps to identify whether any significant differences in terms of mean values exist between the success and failure groups. These tests apply to the 'success' and 'failure' groups. Firstly, they identify the determinants of success for the core, political and economic variables. Secondly, they focus on the determinants of success of the core variables by foreign policy goals. Thirdly, they identify the determinants of success of the foreign policy goals. For all cases, we compare the results between the common and full sample.

5.1 Determinants of success of the core, political and economic variables

Table 21
Mean difference test for the core, political and economic variables

Variables	Common case			Full sample		
	Success	Failure	MD	Success	Failure	MD
Core variables						
Policy result	3.73	2.07	1.66***	3.59	2.14	1.44***
Sanction Contribution	3.24	1.96	1.29***	3.26	2.01	1.24***
Success score	12.14	4.18	7.96***	11.69	4.41	7.28***
Political variables						
International cooperation	1.84	2.03	-0.19	2.07	2.10	-0.03
Duration	4.24	8.71	-4.46**	4.24	8.42	-4.18***
Prior relation	2.35	1.91	0.44***	2.33	1.99	-0.34***
Regime of target	1.91	1.67	0.25	2.00	1.68	0.32***
Political stability prior	0.12	0.13	-0.01	0.12	0.17	-0.05
Political stability during	0.07	0.06	0.01	0.07	0.09	-0.03
Economic variables						
Cost to target	320.08	162.89	157.19	657.98	450.67	207.31
Cost (% of GNP)	2.69	1.13	1.55**	4.18	2.53	1.66
Cost per capita	16.19	8.78	7.41	46.88	30.49	16.39
Trade linkage	26.03	19.70	6.33	33.23	29.05	4.17
GNP ratio	316.76	675.63	-358.87	1014.53	2378.19	-1363.67
Health stability	1.86	2.37	-0.50***	1.86	2.06	-0.20*
Cost to sender	1.76	2.09	-0.33**	1.86	1.99	-0.14
GDP growth rate	4.44	4.30	0.14	2.53	3.47	-0.94
Inflation	17.86	26.54	-8.67	184.37	45.80	138.57*

***p<0.01, **p<0.05 and *p<0.1

Table 21 shows that there are significant statistical differences between the groups both in the common and full sample.

In order to identify what are the determinants of success of the political variables, we have applied the independent sample t-test for the political variables, checking how the result varies from common to the full sample (we provide a multivariate analysis in section 5.5). For the common cases, significant differences exist between the groups for duration and prior relation variables. The sign of the mean difference is positive for prior relation and negative for duration, implying that the mean value of the success is higher than the failure group. Thus the higher is the mean value for the prior relation and the more cordial the relationship between the target and the sender, the more likely that the economic sanction would be successful. Conversely, the negative sign in the mean difference for duration implies that mean value of duration is larger for the failure than the success group. It implies that larger the length of the duration of economic sanctions, the less likely that the economic sanction would be successful. Thus the duration, prior relation and regime of target are found to be the most important determinants of success of economic sanctions.

The determinants of success of the economic variables show the significant differences in cost as a percentage of GNP to the target, health and stability of the target economy and the cost to sender. But in the full sample, we do not find significant difference between the groups for cost as a percentage of GNP and cost to sender. However, there are significant differences between the groups for health and stability and inflation of the target economy in the full sample. The negative sign of health and stability implies that mean value of this is lower for the success case than that of the failures. For the third addition, we observe the difference is positive for inflation and it is statistically significantly different from zero at the 10% level of significance. Therefore 'health and stability' and inflation are the two main economic determinants of the success in the full sample though other differences give a lot of information for policy purposes.

Note again that we simply follow the Hufbauer et al. approach although important explanatory variables have been omitted. That is not of concern here because we want to see how results reported by Hufbauer et al change between the 2nd and 3rd edition when we correct for changes in methodology and case selection. Readers interested in a comprehensive analysis of alternative analytic approaches are referred to van Bergeijk (2009).

5.2 Determinants of success by foreign policy goals

This study uses policy result, sanctions contribution and success score as the core variables as these are widely used to see the effectiveness of economic sanctions. The findings are summarized in table 22, which shows that all the mean differences are statistically significant at the 10% level of significance though the mean differences for each variable differ across foreign policy goals. For example, the mean difference is 2.55 for policy result in the common case. For policy result we find that mean values of the policy result index are lower in the full sample for all types of foreign policies except for other major changes in the target country. The highest mean difference value is found for impairment of military adventures including major wars at 2.1 in the full sample. The mean values of sanctions contribution and success score also varies across foreign policy goals both for common and full sample. Whereas the highest mean differences are 1.7 and 10.5 for disruption of military adventures other than major wars and impairment of military adventures including major wars respectively in the common case, it is 1.6 and 9.0 in the full sample. Therefore, we can conclude that the highest mean differences for all three categories are not consistent for measuring the effectiveness of foreign policies. The effectiveness of foreign policies depends on what types of indicators we use for the measurement. The mean values and the differences are summarized in Table 22.

Table 22
Mean difference test for the core variables by foreign policy goals

Variables	Common case	Full sample
	Mean difference	Mean difference
Modest policy change		
Policy result	2.6***	1.7***
Sanction Contribution	1.3***	1.1***
Success score	8.5***	7.6***
Regime change and democratization		
Policy result	1.4***	1.2***
Sanction Contribution	1.1***	1.1***
Success score	6.6***	6.6***
Disruption of military adventures other than major wars		
Policy result	1.9***	1.3**
Sanction Contribution	1.7***	1.6***
Success score	10.0***	8.8***
Impairment of military adventure including major wars		
Policy result	2.2***	2.1***
Sanction Contribution	1.6***	1.4***
Success score	10.5***	9.0***
Other major changes in the target country		
Policy result	1.4*	1.5***
Sanction Contribution	1.3***	1.2***
Success score	7.6***	6.8***

Note: + the detailed findings are available in table A.10. Here we have only reported the mean difference as it is worthwhile and convenient to observe the result. Positive sign of the mean difference implies the higher mean value for the success than the failure group.
***p<0.01, **p<0.05 and *p<0.1

5.3 Determinants of success by political variables

As it is clear from the previous discussion that success scores differ across the foreign policy goals, this section focuses on the determinants of success of each foreign policy goal separately. Here we also compare results of the full sample with the common cases. Table 23 shows that mean value of international cooperation is marginally lower for success than the failure cases both in the common and full sample. Larger mean value of duration is found for the failure cases and it is statistically significant for the full sample. Therefore, duration plays an important role for a modest foreign policy to be effective. The economic sanctions that take short duration are more likely to succeed. Mean difference values are found positive for prior relation and regime of target. Economic sanctions therefore have higher possibility of success if the sender had cordial relationship with target and the sender targeted the democratic regime. The magnitudes are very small and negative for the political stability prior and during the economic sanctions. In the full sample, mean difference is positive and statistically significant at 5% level for regime of target and is negative and statistically significant for duration. Thus we find the two most important determinants of modest policy change: duration and the regime of target.

For the regime change and democratization, the mean values of international cooperation, duration and political stability prior are lower for the success group than the failure, but the mean differences are not statistically significant. However the mean values of prior relation and regime of target of the success cases are higher and statistically significant at 5% and 1% level of significance respectively. Prior relations and regime of target therefore play an important role in the effectiveness of economic sanctions in order to achieve regime change and democratization as a foreign policy goal.

Table 23 shows that none of the mean difference of the political variables is statistically significant for the disruption of military adventures. Though the mean values of success cases are same in the common and full sample, mean values of the failure cases differ between the common and full sample. The absolute mean difference is higher for duration both in the common and full sample. This implies that the mean value of duration of the failure cases is higher than that of successes. In all other political variables, the magnitudes of the mean difference are not large. Therefore, there are no political variables that can play an important role in the effectiveness of economic sanctions in order to achieve disruption of military adventures.

We find no statistically significant mean differences both in common cases and the third edition for military impairment. The mean values of success and failure cases differ between common and full sample. The absolute mean difference is higher for duration both in the common and full sample. This implies that the mean value of duration of the failure cases is higher than that of successes. Though the mean differences are positive for international cooperation and prior relation in the common cases, these are negative for all other political variables. But in the full sample, all the mean differences except for international cooperation are negative. (The sign of the mean difference could perhaps play a role for policy implication of the effectiveness of economic sanctions on a certain foreign policy goal.)

The independent sample t-test shows that for the common case there is a significant and positive mean difference of political stability prior to the economic sanctions imposed on the target country. However, this mean difference is not statistically significant in the full sample. Mean differences of the two political variables, international cooperation and prior relation, are found statistically significant in the full sample.

Table 23
Mean difference test for the political variables by foreign policy goals

Political variables	Mean difference									
	Modest policy		Regime change and democratization		Military disruption		Military impairment		Others	
	Common	Full	Common	Full	Common	Full	Common	Full	Common	Full
International cooperation	-0.09	-0.36	-0.36	-0.16	0.28	0.30	0.04	0.49	-0.05	0.72*
Duration	-3.09	-3.66**	-2.60	-2.56	-3.97	-4.88	-6.48	-5.48	-10.12	-6.08
Prior relation	0.18	0.32	0.56**	0.37**	0.36	0.32	0.56	-0.09	0.60	0.63**
Regime of target	0.73*	0.62**	0.26	0.45***	0.08	-0.18	-0.52	-0.48	1.00	0.33
Political stability prior	0.00	-0.04	-0.10	-0.06	0.19	0.15	-0.13	-0.16	0.32**	0.05
Political stability during	-0.09	-0.09	0.03	-0.03	-	-	-0.02	-0.03	-0.01	0.03

Note: + the detailed findings are available in table A.11. Here we have only reported the mean difference as it is worthwhile and convenient to observe the result. Positive sign of the mean difference implies the higher mean value for the success.
***p<0.01, **p<0.05 and *p<0.1

5.4 Determinants of success of the foreign policy goals by economic variables

What factors influence the foreign policy to be successful? This question arises in the mind of researchers and policy makers alike in order to observe the determinants of success by the foreign policy goals. This section analyses the determinants of success of the foreign policy goals in details using the approach of independent sample t-test.

Firstly, we focus on the modest policy change based on economic variables and also compare results of the full sample with the common cases. Mean differences are positive for cost to target, cost as a percentage of GNP, cost per capita, trade linkage and inflation in the common cases and full sample. This implies the higher mean values of the success cases than the failures. Mean differences are negative for health and stability of the target economy, cost to sender and the GDP growth rate of the target. It implies lower mean values of the success cases of economic sanctions. Whereas the sign of mean difference is positive for GNP ratio in the common cases, it is negative in the full sample. This study finds the significant mean difference for health and stability and GDP growth rate in the common cases and full sample respectively. Therefore, economic sanctions are more effective in the case of less GDP growth of a target country.

In the common cases for regime change and democratization, the negative mean differences are observed for cost to target, GNP ratio, health and stability, cost to sender and inflation. But in the full sample, mean difference for inflation is found to be positive. In addition, the sign is negative for cost per capita. Whereas cost to target is higher for the success cases of modest policy change, it is lower for regime change and democratization. Though no mean difference coefficients are statistically significant, however sign can play role to the success of economic sanctions.

For military disruption, Table 24 shows that though the mean values of the success cases for economic variables are same both in the common cases and full sample, these differ in the failure cases and this, in turn, makes the difference in the values of the mean differences. In the full sample, this study finds no significant mean differences for any of economic variables. However, we can say that the mean values of the success cases are lower than the failure cases for all economic variables except for health and stability.

Here we see that all the mean values of economic variables differ between common cases and full sample. Whereas cost as a percentage of GNP and cost per capita are found as determinants of success of military impairment in the common cases, we find that cost to target, cost as a percentage of GNP, cost per capita and cost to sender are the determinants of success of military impairment in the full sample. Whereas the sign is negative for cost to sender in the common cases, it is positive and significant in the full sample. Four economic variables therefore are playing a very crucial role for the impairment of military potential.

Table 24
Mean difference test for the economic variables by foreign policy goals

Economic variables	Mean difference									
	Modest policy		Regime change and democratization		Military disruption		Military impairment		Others	
	Common	Full	Common	Full	Common	Full	Common	Full	Common	Full
Cost to target (million $)	325.40	291.67	-153.29	-284.93	-50.50	-24.83	402.92	2305.44*	1094***	5.73
Cost (% of GNP)	0.14	1.31	1.53	0.01	-0.38	-2.09	2.36**	8.75**	4.61**	3.10
Cost per capita	6.44	23.98	4.71	-8.48	2.05	-3.10	15.21***	140.16**	1.76	16.77
Trade linkage	5.52	4.70	10.82	4.72	1.89	-8.09	1.79	15.66	0.31	9.43
GNP ratio	3.71	-305.49	-1317.39	-2687.74	-122.97	-3316.68	24.25	1.05	-14.69	1673.67
Health and stability	-0.55**	-0.34	-0.50	-0.19	-0.08	0.12	-0.12	-0.13	-0.64*	-0.48
Cost to sender	-0.09	-0.18	-0.26	-0.13	0.08	-0.05	-0.04	0.54*	-0.83	-0.60*
GDP growth rate	-1.49	-2.47**	1.03	0.92	-0.72	-3.10	2.04	0.75	1.44	-2.76
Inflation	10.66	303.68	-29.81	153.46	0.02	-128.65	-12.21	-74.23	-0.14	17.14

Note: + the detailed findings are available in table A.12. Here we have only reported the mean difference as it is worthwhile and convenient to observe the result. Positive sign of the mean difference implies the higher mean value for the success.
***p<0.01, **p<0.05 and *p<0.1

For other major changes in the target country, there are huge variations in the mean values of the success and failure cases in the common and full sample. Significant mean differences are found for cost to target, cost as a percentage of GNP and health and stability in the common cases. However in the full sample, only one significant mean difference is found, which is cost to sender. Whereas mean difference is negative for GNP ratio, it is positive and very high in the full sample. While mean difference for GDP growth rate is positive in the common cases; it is negative in the full sample. The inverse picture of this is found for inflation.

5.5 Econometric modelling for the determinants of success of the foreign policy goals

The 1st and 2nd editions of *Economic Sanctions Reconsidered*, authored by Hufbauer et al. (1985, 1990) did not apply advanced econometric techniques to analyse the effectiveness of economic sanctions. Apart from the tabulation of simple mean values, they used ordinary least squares (OLS) to differentiate the more 'successful' cases from the 'less successful' ones (Hufbauer et al., 2007). However, they did not check whether mean values of the success cases differ from the failure cases. This study fills up this gap using mean difference test in order to find the determinants of success of the economic sanctions. The 3rd edition also lacks in this respect, but this time Hufbauer et al have used econometric methods to evaluate success of the economic sanctions in achieving foreign policy goals (they did not estimate the marginal effects). We have used the latest dataset of the Peterson Institute for International Economics and estimated the marginal effects using the probit model for measuring the probability of success and then we have compared the results of common cases in the 2nd and 3rd editions with the full sample. This paper uses three specifications both for the common in the 2nd and 3rd editions and full sample in order to observe how sensitive the estimates are:

- Specification (1) includes only the foreign policy goals
- Specification (2) specification includes the foreign policy goals and adds political variables
- Specification (3) specification includes the foreign policy goals and political variables and adds economic variables.

Table 25
Probit regression results for the probability of 'success' of economic sanctions

Variables	Common cases in the 2nd edition			Common cases in the 3rd edition			Full sample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Success	Success	Success	Success	Success	Success	Success	Success	Success
Foreign policy (=1 if modest policy change)	0.279*	0.324*	0.613***	0.355***	0.545***	0.876***	0.218**	0.230*	0.278**
	(0.164)	(0.192)	(0.211)	(0.164)	(0.179)	(0.050)	(0.115)	(0.122)	(0.144)
Foreign policy (=1 if regime change and democratization)	0.167	0.248	0.342	0.270*	0.549***	0.859***	0.019	0.039	-0.087
	(0.152)	(0.174)	(0.285)	(0.154)	(0.169)	(0.112)	(0.099)	(0.110)	(0.139)
Foreign policy (=1 if military adventures)	0.084	0.120	0.125	0.164	0.418*	0.743***	-0.091	-0.086	-0.115
	(0.194)	(0.228)	(0.354)	(0.201)	(0.239)	(0.097)	(0.129)	(0.132)	(0.185)
Foreign policy (=1 if military impairment)	0.069	0.189	0.370	0.078	0.289	0.749***	0.017	0.110	0.060
	(0.180)	(0.211)	(0.305)	(0.189)	(0.241)	(0.105)	(0.123)	(0.139)	(0.171)
Companion policies (=1 if regular military action)		0.336*	0.524***		0.271	0.409*		0.093	0.106
		(0.187)	(0.206)		(0.203)	(0.254)		(0.128)	(0.164)
International cooperation		-0.003	-0.074		-0.009	-0.225		0.028	0.036
		(0.054)	(0.084)		(0.056)	(0.152)		(0.040)	(0.058)
Cooperating international organization (=1 if cooperates)		-	-		0.351**	0.677***		0.068	0.094
					(0.146)	(0.130)		(0.092)	(0.123)
International assistance (=1 if there is assistance to target)		-0.121	-0.264*		-0.094	0.079		-0.110	-0.005
		(0.123)	(0.123)		(0.135)	(0.228)		(0.089)	(0.131)
Prior relation (1 to 3)		0.174***	0.156		0.149**	0.102		0.109**	0.036
		(0.071)	(0.105)		(0.074)	(0.170)		(0.049)	(0.072)
Regime of target (=1 if democratic)		-	-		0.234*	0.434**		0.125	0.124
					(0.134)	(0.197)		(0.090)	(0.124)
Duration		-0.021	-0.018		-0.010	-0.008		-0.010*	-0.011
		(0.010)	(0.013)		(0.007)	(0.012)		(0.006)	(0.009)

Cost to target (in million $)			0.001			0.001***			0.000
			(0.001)			(0.000)			(0.000)
GNP ratio			0.000***			0.000			-0.000**
			(0.000)			(0.000)			(0.000)
Trade linkage (%)			0.005**			0.004			0.004*
			(0.003)			(0.004)			(0.002)
Health and stability (=1 if distress or significant problems)			0.033			0.149			0.029
			(0.144)			(0.164)			(0.110)
Cost to sender			-0.029			0.132			-0.007
			(0.117)			(0.121)			(0.065)
Growth rate			-			0.046*			0.006
						(0.028)			(0.010)
Inflation			-			-0.002			0.000**
						(0.002)			(0.000)
Observations	**105**	**105**	**95**	**105**	**101**	**65**	**205**	**199**	**139**
Pseudo R-squared	**0.03**	**0.052**	**0.33**	**0.05**	**0.19**	**0.37**	**0.03**	**0.11**	**0.15**
Prob>chi2	**0.47**	**0.15**	**0.00**	**0.19**	**0.031**	**0.003**	**0.11**	**0.02**	**0.05**

Source: Authors' new dataset constructed from Hufbauer, Schoot, Elliot, and Oegg (2007). Robust standard errors in the parentheses.***p<0.01, **p<0.05 and *p<0.1

In the probit model, the dependent variable 'success' is strictly dichotomous- it is 0 or 1. This study follows Hufbauer et al (1985, 2007), for defining 'success', which is discussed in the earlier section. In the probit model, the variable 'success' is recalibrated to take on a value of 0 if the success score is 1, 2, 4, 6 or 8 and the success score is set at 1 if the success score is 9, 12 or 16. As there are five foreign policy goals, this study includes four in the regression to compare results with the base, i.e., other major changes in the target country. Companion policy is also recalibrated as 1 if regular military action is considered and 0 for otherwise. International cooperation is a dummy variable which takes values from 1 to 4 (no to significant cooperation). If any international organization cooperates for the economic sanction, this study considers 1 and 0 for otherwise. If target country receives any international assistance, it takes value 1. International cooperation is a continuous variable which takes values from 1 to 3 (antagonistic to cordial). Health and stability is also a dummy variable taking 1 for distressed and significant problem in the target economy and 0, otherwise.

Table 25 represents the results of applying the binary probit model to the Hufbauer-Schott-Elliot-Oegg database using only one dependent variable 'success', which is the prime motive of any foreign policy goal. In this multivariate framework we can now show the impact of methodology and case selection. The marginal effects in the first and second specification are consistently larger and more significant in the 3rd edition than in the 2nd edition (column 1 and versus column 4 and 5). This implies that the 3rd edition's methodology is biased in favour of finding positive results for modest policy change, regime change and the use of sanctions to disrupt military adventures and to achieve military impairment. Interestingly and despite this bias introduced in 105 common cases, the analysis for the full sample (205 cases) by and large confirms the analysis based on the data in the 2nd edition (see column 7 and 8).

For comparison we also include specifications with economic variables (columns 3, 6 and 9), but here the results must be interpreted with caution because the number of observations differs considerably and therefore a fair comparison is only possible between column 6 and column 9. The main point to note here is that the full sample and 2nd edition estimates show significance of the GNP ratio and trade linkage.

6 Conclusion

This paper analysed the development of different vintages of the Peterson Institute database on international economic sanctions understanding to what extent database modification influences the effectiveness of economic sanctions for achieving certain foreign policy goals like modest policy change in the target country, regime change and democratization, military adventures other than major wars, military impairment including major wars and other major changes in the target country. It examined databases used by Hufbauer et al. (1985, 2007) exploring results between the common cases in the 2nd and 3rd editions. In addition, this study also examined how the result varies between the common cases and full sample in the third edition. For that purposes, this

study used descriptive statistics, ratio analysis, first-difference method and finally, probit determinants of success. This study finds that within the common cases of the 2nd and 3rd edition, about 17% of the cases are modified and changed to some extent. Even in some cases, principal sender and target are changed. The number of goals is raised to 155 from 146 and the average number of goals to 1.53 from 1.45 in the 3rd edition for the same 101 cases. The list of political and economic variables is extended in the 3rd edition including cooperating international organization, regime of target, political stability prior and during the economic sanctions, GDP growth and inflation. While health and stability is considered as political variable in the 2nd edition, it is under the list of economic variables in the 3rd edition. In cases of core variables, substantial change is found for contribution due to redefining the index value of sanction contribution. The value index 1 implies zero or negative contribution in the in 2nd edition whereas it indicates only negative contribution in the 3rd edition and substantial and decisive contributions are replaced in the 3rd instead of modest and significant contribution. The average success scores are 6.58 and 6.98 for the common cases in the 2nd and 3rd edition respectively. This study finds the higher mean values for all categories of core variables for the common cases in the 3rd edition and the average values of economic variables also differ across editions.

The success ratios of all foreign policy goals except for the modest policy change are lower than the overall success ratio in the full sample of the 3rd edition. Success ratios of the core variables are found less in the full sample compared to the common cases in the 3rd edition. Whereas success ratio of minor international cooperation is substantially lower in the full sample, it is higher for modest and significant international cooperation. Very poor success ratios are found for antagonistic prior relation, autocratic regime of target and international assistance to target both in the common and full sample in the 3rd edition. Whereas success ratio of the distressed target economy is lower in the full sample, it is higher for the state of strong and stable target economy. In case of only financial sanction type, success ratio is substantially higher in the common than the full sample. Success ratios of the net gain to sender and little effect on sender are higher in the common; it is found for the modest and major loss to sender. Among the cost categories to the target, cost as a percentage of GNP and cost per capita have the higher success ratios compared to others though they differ between the common and full sample. Trade linkage and inflation also play an important role as this study finds the higher trade linkages between the sender and target and higher inflation in the target bring more success to the economic sanctions. This study finds two important determinants of success (duration and prior relation) from the political variables and three (cost as a % of GNP, health and stability and cost to sender) in the common cases. However, we find one more important determinant which is regime of target for the political variables and two determinants (health and stability and inflation) for the economic variables in the full sample. Though the mean differences vary between the common and full sample, this study finds the significant mean differences between the success and failure groups. Mean difference test for the political variables by the foreign policy goals finds that regime of target is the most important determinant both in the common and full sample. But full sample recognizes

one more important determinant which is duration of economic sanction. This study also finds that prior relation has significant mean differences between the success and failure groups in the common case. However, it finds prior relation and regime of target in the full sample. Political stability prior to the sanction is found as an important determinant for other major changes in the target in the common cases but not in the full sample. It is prior relation to target in the full sample. This study finds no significant mean differences in the common and full sample for military disruption and impairment. For the modest policy change, significant mean difference is found for health and stability and GDP growth in the common case and full sample respectively. In cases of regime change and democratization and military disruption other than major wars, this study finds no significant mean differences between the success and failure cases both in the common and full sample. However for military impairment, significant mean differences are found for cost as a percentage of GNP and cost per capita in the common cases. Full sample adds one more determinant which is cost to target in this regard. In the common cases, cost to target and cost as a percentage of GNP are found as the two most important determinants of other major changes in the target. In the full sample, only cost to sender has significant mean difference.

The probit model gives a consistent result only for the modest policy change. It implies that the probability of success of the modest policy change is significantly higher than that of the other major changes in the target country. Importantly the probit analysis provides a multivariate framework than enables us to show that the 3rd edition's methodology in comparison to the methodology used in the 2nd edition is biased in favour of finding positive results for modest policy change, regime change and the use of sanctions to disrupt military adventures and to achieve military impairment.

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Appendices

Table A.1
Reflection of changes in policy result

Policy result	Edition	
	2nd	3rd
Failed outcome	27.6	24.8
Unclear but possibly positive	25.7	21.0
Positive outcome	14.3	18.1
Successful outcome	32.4	36.2
N=105 (Common cases)		

Source: Authors tabulated from new dataset constructed from Hufbauer et al. (1985 & 2007).

Table A.2
Reflection of changes regarding contribution

Sanctions contribution*	2nd edition (% of cases)	3rd edition (% of cases)
Zero or negative/Negative contribution	31.4	7.6
Minor contribution	27.6	52.4
Modest/Substantial contribution	27.6	31.4
Significant/Decisive contribution	13.3	8.6
N=105		

Note: *First and second component refer to 2nd and 3rd edition respectively.

Table A.3
Comparison of companion policies

Companion policies	2ndedition		3rdedition	
	Cases	% of cases	Cases	% of cases
Regular military action	13	33.3	13	37.1
Quasi-military action	9	23.1	8	22.9
Covert action	10	25.6	8	22.9
Quasi and regular military action	3	7.7	2	5.7
Quasi-military and convert action	4	10.3	4	11.4
Total	**39**	**100**	**35**	**100**

Table A.4
Comparison of international cooperation

International cooperation*	2nd edition	3rd edition
	% of cases	% of cases
No cooperation (=1)	46.7	47.6
Minor cooperation (=2)	21.0	21.0
Modest cooperation (=3)	20.0	19.0
Significant cooperation (=4)	12.4	12.4
N=105		

Note: *Figure in the parentheses implies the index value for that particular category.

Table A.5
Comparison of prior relation

Types of prior relation*	% of cases in the 2nd edition	% of cases in the 3rd edition
Antagonistic (=1)	21.9	22.9
Neutral (=2)	47.6	47.6
Cordial (=3)	30.5	29.5
N=105		

Note: *Figure in the parentheses implies the index value for that particular category.

Table A.6
Comparison of success cases by foreign policy goals

Foreign policy goals	Common cases		Full sample	
	Success cases	%	Success cases	%
Modest policy changes	11	29.73	22	31.43
Regime Change and democratization	15	40.54	25	35.71
Disruption of military Adventure	4	10.81	4	5.71
Military impairment	4	10.81	9	12.86
Other major policy changes	3	8.11	10	14.29
Total	**37**	**100**	**70**	**100**

Table A.7
Success ratio by foreign policy goals

Foreign policies	Common cases				Full sample			
	Success cases	Failure cases	Total cases	Success ratio	Success cases	Failure cases	Total cases	Success ratio
Modest policy changes	11	11	22	**50**	22	21	43	**51**
Regime Change and democratization	15	21	36	**42**	25	55	80	**31**
Disruption of military Adventure	4	9	13	**31**	4	15	19	**21**
Military impairment	4	13	17	**24**	9	20	29	**31**
Other major policy changes	3	14	17	**18**	10	24	33	**27**
Total	**37**	**68**	**105**	**35**	**70**	**135**	**205**	**34**

Table A.8
Comparison of success ratios of core and political variables

Variables	Common case				Full sample			
	Success cases	Failure cases	Total	Ratio	Success cases	Failure cases	Total	Ratio
Core variables								
Policy result	37	68	105	**35.2**	70	135	205	**34.1**
Sanction Contribution	37	68	105	**35.2**	70	134	204	**34.3**
Success score	37	68	105	**35.2**	70	134	204	**34.3**
Political variables :								
Companion Policies								
Regular military action	4	9	13	**30.8**	9	18	27	**33.3**
Quasi-military operation	3	5	8	**37.5**	4	15	19	**21.1**
Covert action	5	3	8	**62.5**	5	4	9	**55.6**
International Cooperation								
No cooperation	20	30	50	**40.0**	34	49	83	**41.0**
Minor cooperation	7	15	22	**31.8**	8	39	47	**17.0**
Modest cooperation	6	14	20	**30.0**	17	29	46	**37.0**
Significant contribution	4	9	13	**30.8**	11	17	28	**39.3**
Prior Relation								
Antagonistic	3	21	24	**12.5**	9	39	48	**18.8**
Neutral	18	32	50	**36.0**	29	58	87	**33.3**
Cordial	16	15	31	**51.6**	32	37	69	**46.4**
Regime of target								
Autocracy	14	35	49	**28.6**	24	68	92	**26.1**
Democracy	11	13	24	**45.8**	24	26	50	**48.0**
Others								
International assistance to target	6	17	23	**26.1**	8	31	39	**20.5**
Cooperating international organization	6	6	12	**50.0**	15	26	41	**36.6**
Duration less than or equal average	31	48	79	**39.2**	58	89	147	**39.5**
Duration greater than average	6	20	26	**23.1**	12	45	57	**21.1**

Note: Authors calculated from new data set.

Table A.9
Comparison of success ratios of economic variables

Economic variables	Common case				Third edition			
	Success cases	Failure cases	Total	Success ratio	Success cases	Failure cases	Total	Success ratio
Health and Stability								
Distressed	13	6	19	**68.4**	25	34	59	**42.4**
Significant problems	16	31	47	**34.0**	30	59	89	**33.7**
Strong and stable	8	31	39	**20.5**	15	42	57	**26.3**
Health and stability overall	37	68	105	**35.2**	70	135	205	**34.1**
Sanctions type								
Financial, export or import	16	33	49	**32.7**	32	68	100	**32.0**
Export, import or both	5	19	24	**20.8**	10	30	40	**25.0**
Only financial	12	13	25	**48.0**	19	34	53	**35.8**
Overall of sanction type	33	65	98	**33.7**	61	132	193	**31.6**
Cost to sender								
Net gain to sender	15	17	32	**46.9**	26	37	63	**41.3**
Little effect on sender	17	33	50	**34.0**	31	69	100	**31.0**
Modest loss	4	13	17	**23.5**	10	22	32	**31.2**
Major loss	1	5	6	**16.7**	3	7	10	**30.0**
Cost to sender overall	37	68	105	**35.2**	70	135	205	**34.1**

Cost to target								
Cost to target (<= average) in million $	26	47	73	**35.6**	48	109	157	**30.6**
Cost to target (>average) in million $	7	14	21	**33.3**	12	12	24	**50.0**
Cost as a % of GNP (<= average)	21	46	67	**31.3**	38	92	130	**29.2**
Cost as a % of GNP (>average)	12	14	26	**46.2**	22	26	48	**45.8**
Cost per capita (<= average)	23	54	77	**29.9**	47	108	155	**30.3**
Cost per capita (>average)	10	6	16	**62.5**	13	12	25	**52.0**
Trade linkage								
Trade linkage (<= average)	18	43	61	**29.5**	39	84	123	**31.7**
Trade linkage (> average)	19	23	42	**45.2**	31	47	78	**39.7**
Trade linkage overall	37	66	103	**35.9**	70	131	201	**34.8**
GNP ratio (<=average)	31	59	90	**34.4**	64	117	181	**35.4**
GNP ratio (>average)	6	8	14	**42.9**	6	17	23	**26.1**
GDP growth (<=average)	18	30	48	**37.5**	30	56	86	**34.9**
GDP growth (>average)	16	29	45	**35.6**	36	63	99	**36.4**
Inflation (<=average)	26	33	59	**44.1**	55	92	147	**37.4**
Inflation (>average)	6	9	15	**40.0**	8	7	15	**53.3**

Note: Authors calculation.

Table A.10
Mean difference test of the core variables by foreign policy goals

Variables	Common case			Full sample		
	Success	Failure	Mean Difference	Success	Failure	Mean Difference
Modest policy change						
Policy result	3.55	1.55	**2.55*** **	3.45	1.71	**1.74*** **
Sanction Contribution	3.27	2.00	**1.27*** **	3.32	2.19	**1.13*** **
Success score	11.64	3.18	**8.45*** **	11.50	3.86	**7.64*** **
Regime change and democratization						
Policy result	3.73	2.38	**1.35*** **	3.64	2.42	**1.22*** **
Sanction Contribution	3.07	1.95	**1.11*** **	3.20	2.07	**1.13*** **
Success score	11.47	4.86	**6.61*** **	11.64	5.04	**6.60*** **
Disruption of military adventures other than major wars						
Policy result	4.00	2.11	**1.89*** **	4.00	2.67	**1.33** **
Sanction Contribution	3.50	1.78	**1.72*** **	3.50	1.87	**1.63*** **
Success score	14.00	4.00	**10.00*** **	14.00	5.20	**8.80*** **
Impairment of military potential including major war						
Policy result	4.00	1.77	**2.23*** **	3.78	1.70	**2.08*** **
Sanction Contribution	3.50	1.92	**1.58*** **	3.22	1.80	**1.42*** **
Success score	14.00	3.46	**10.54*** **	12.22	3.20	**9.02*** **
Other major changes in the target country						
Policy result	3.67	2.29	**1.38***	3.40	1.92	**1.48*** **
Sanction Contribution	3.33	2.07	**1.26*** **	3.20	2.00	**1.20*** **
Success score	12.33	4.71	**7.62*** **	10.80	3.96	**6.84*** **

***p<0.01, **p<0.05 and *p<0.1

Table A.11
Mean difference test of the political variables by foreign policy goals

Political Variables	Common case			Third edition		
	Success	Failure	Mean Difference	Success	Failure	Mean Difference
Modest policy changes						
International cooperation	1.55	1.64	**-0.09**	1.50	1.86	**-0.36**
Duration	2.64	5.73	**-3.09**	2.86	6.52	**-3.66****
Prior relation	2.18	2.00	**0.18**	2.36	2.05	**0.32**
Regime of target	2.27	1.55	**0.73***	2.32	1.70	**0.62****
Political stability prior	0.04	0.04	**0.00**	0.11	0.16	**-0.04**
Political stability during	0.05	0.14	**-0.09**	0.04	0.14	**-0.09**
Regime Change and democratization						
International cooperation	1.73	2.10	**-0.36**	2.04	2.20	**-0.16**
Duration	7.40	10.00	**-2.60**	5.44	8.00	**-2.56**
Prior relation	2.47	1.90	**0.56****	2.52	2.15	**0.37****
Regime of target	1.71	1.45	**0.26**	1.92	1.46	**0.45*****
Political stability prior	0.10	0.20	**-0.10**	0.12	0.19	**-0.06**
Political stability during	0.14	0.11	**0.03**	0.13	0.15	**-0.03**
Disruption of military adventures other than major wars						
International cooperation	2.50	2.22	**0.28**	2.50	2.20	**0.30**
Duration	1.25	5.22	**-3.97**	1.25	6.13	**-4.88**
Prior relation	2.25	1.89	**0.36**	2.25	1.93	**0.32**
Regime of target	1.75	1.67	**0.08**	1.75	1.93	**-0.18**
Political stability prior	0.33	0.13	**0.19**	0.33	0.18	**0.15**
Political stability during	-	-	**-**	-	-	**-**
Impairment of military potential including major wars						
International cooperation	2.50	2.46	**0.04**	2.89	2.40	**0.49**
Duration	1.75	8.23	**-6.48**	6.22	11.70	**-5.48**
Prior relation	2.25	1.69	**0.56**	1.56	1.65	**-0.09**
Regime of target	1.25	1.77	**-0.52**	1.22	1.70	**-0.48**
Political stability prior	0.08	0.20	**-0.13**	0.04	0.21	**-0.16**
Political stability during	0.00	0.02	-0.02	0	0.03	**-0.03**
Other major changes in the target country						
International cooperation	1.67	1.71	**-0.05**	2.50	1.78	**0.72***
Duration	1.67	11.79	**-10.12**	3.70	9.78	**-6.08**
Prior relation	2.67	2.07	0.60	2.50	1.87	**0.63****
Regime of target	3.00	2.00	**1.00**	2.33	2.00	**0.33**
Political stability prior	0.35	0.03	**0.32****	0.14	0.09	**0.05**
Political stability during	0.00	0.01	**-0.01**	0.07	0.04	**0.03**

***p<0.01, **p<0.05 and *p<0.1

Table A.12
Mean difference test of the economic variables by foreign policy goals

Economic Variables	Common case (mean)			Third edition (mean)		
	Success	Failure	Mean Difference	Success	Failure	Mean Difference
Modest policy changes						
Cost to target (in million $)	367.90	42.50	**325.40**	341.32	49.65	**291.67**
Cost (% of GNP)	0.95	0.81	**0.14**	2.55	1.24	**1.31**
Cost per capita	10.59	4.15	**6.44**	32.78	8.81	**23.98**
Trade linkage	19.59	14.07	**5.52**	23.06	18.36	**4.70**
GNP ratio	105.55	101.85	**3.71**	285.35	590.84	**-305.49**
Health and stability	2.09	2.63	**-0.55****	2.05	2.38	**-0.34**
Cost to sender	1.73	1.82	**-0.09**	1.73	1.90	**-0.18**
GDP growth rate	3.70	5.19	**-1.49**	1.49	3.95	**-2.47****
inflation	20.48	9.82	**10.66**	326.12	22.44	**303.68**
Regime Change and democratization						
Cost to target (in million $)	91.51	244.80	**-153.29**	185.48	470.41	**-284.93**
Cost (% of GNP)	3.58	2.06	**1.53**	3.57	3.56	**0.01**
Cost per capita	22.93	18.21	**4.71**	24.08	32.56	**-8.48**
Trade linkage	34.91	24.09	**10.82**	42.51	37.80	**4.72**
GNP ratio	671.13	1988.52	**-1317.39**	1297.64	3985.38	**-2687.74**
Health and stability	1.40	1.90	**-0.50**	1.48	1.67	**-0.19**
Cost to sender	1.60	1.86	**-0.26**	1.60	1.73	**-0.13**
GDP growth rate	4.88	3.84	**1.03**	3.54	2.62	**0.92**
inflation	11.06	40.87	**-29.81**	185.94	32.48	**153.46**
Disruption of military adventures other than major wars						
Cost to target (in million $)	110.50	161.00	**-50.50**	110.50	135.33	**-24.83**
Cost (% of GNP)	0.85	1.23	**-0.38**	0.85	2.94	**-2.09**
Cost per capita	2.59	1.92	**2.05**	2.59	5.69	**-3.10**
Trade linkage	21.50	19.61	**1.89**	21.50	29.59	**-8.09**
GNP ratio	63.25	186.22	**-122.97**	63.25	3379.93	**-3316.68**
Health and stability	2.25	2.33	**-0.08**	2.25	2.13	**0.12**
Cost to sender	1.75	1.67	**0.08**	1.75	1.80	**-0.05**
GDP growth rate	2.55	3.28	**-0.72**	2.55	5.65	**-3.10**
inflation	16.80	16.78	**0.02**	16.80	145.45	**-128.65**
Impairment of military potential including major wars						
Cost to target (in million $)	613.00	210.08	**402.92**	2605.14	299.70	**2305.44***
Cost (% of GNP)	2.60	0.24	**2.36****	9.54	0.79	**8.75****
Cost per capita	16.14	0.94	**15.21*****	143.23	3.07	**140.16****
Trade linkage	19.25	17.46	**1.79**	36.88	21.22	**15.66**
GNP ratio	47.75	23.50	**24.25**	132.89	131.84	**1.05**
Health and stability	2.50	2.62	**-0.12**	2.22	2.35	**-0.13**
Cost to sender	2.50	2.54	-0.04	2.89	2.35	**0.54***
GDP growth rate	5.78	3.74	2.04	4.11	3.37	**0.75**
inflation	39.48	51.68	-12.21	22.98	97.20	**-74.23**
Other major changes in the target country						
Cost to target (in million $)	1150.33	56.75	**1093.58*****	1045.60	1051.33	**5.73**
Cost (% of GNP)	5.21	o.60	**4.61****	5.54	2.44	**3.10**
Cost per capita	10.33	8.57	**1.76**	65.21	81.98	**16.77**
Trade linkage	20.33	20.02	**0.31**	33.78	24.34	**9.43**
GNP ratio	16.01	30.71	**-14.69**	3084.93	1411.27	**1673.67**
Health and stability	2.00	2.64	**-0.64***	1.90	2.38	**-0.48**
Cost to sender	1.67	2.50	**-0.83**	1.90	2.50	**-0.60***
GDP growth rate	6.75	5.31	**1.44**	1.08	3.84	**-2.76**
inflation	7.35	7.49	**-0.14**	31.96	14.82	**17.14**

***p<0.01, **p<0.05 and *p<0.1