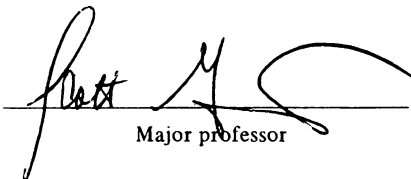This is to certify that the

thesis entitled

RECONSIDERING ECONOMIC SANCTIONS--
WHEN DO THEY WORK?:
A QUANTITATIVE ANALYSIS

presented by

Alfred Cooper Drury

has been accepted towards fulfillment
of the requirements for

___M.A.___degree in _International_ Relations

Major professor

Date _7 August 1992_

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.

DATE DUE	DATE DUE	DATE DUE
JUN 2 8 1998		

MSU Is An Affirmative Action/Equal Opportunity Institution

RECONSIDERING ECONOMIC SANCTIONS--WHEN DO THEY WORK?:
A QUANTITATIVE ANALYSIS

By

Alfred Cooper Drury

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Multi-Disciplinary Program

1992

ABSRTACT

RECONSIDERING ECONOMIC SANCTIONS--WHEN DO THEY WORK?:
A QUANTITATIVE ANALYSIS

By

Alfred Cooper Drury

The purpose of this thesis is to examine the work done by Gary Hufbauer, Jeffery Schott

and Kimberly Elliott in *Economic Sanctions Reconsidered*. Using the data from their 115 case

studies of economic sanctions published in their books I test their results, and determine

when economic sanctions are effective. There are many problems with the data and with

some of the evaluations within their work, these will also be addressed. The plan of the

thesis is to address the relevant issues and definitions involved with economic sanctions,

including an evaluation of Hufbauer Schott and Elliott. Next, the quantitative analysis

and results are presented followed by examination of the faults of the study and some

possible solutions to them. Lastly, I will discuss the implications and problems presented

in the study and the direction of future research.

To all my teachers who taught me
to love learning, of which my
parents top the list.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

v

LIST OF FIGURES

Chapter I:
Introduction

Economic sanctions have been used throughout history for different reasons and with different levels of success. However, the study of sanctions has been rather sporadic. Most scholars concentrate on the question of why sanctions fail so often (almost twice as many fail as succeed) and yet are still frequently used.[1] Before leaping into this thesis, a short example of a sanction follows. Although there is no formula for a sanction, an example of one may prove to be useful as a point of reference which can be used when sanctions are discussed at the world level. What follows is a description of the US sanctions against the Dominican Republic in 1960.

In 1930 Rafael Trujillo assumed power of the Dominican Republic and began a reign of oppression. Between 1959-1960 he initiated a campaign to exterminate all opposition ex-patriots. During this same time the world recession was particularly severe to Latin America, damaging the Dominican Republic's earnings. Trujillo maintained military spending of $80 to $100 million, approximately one third of the national budget, which intensified the damage. On 24 June 1960, the Trujillo family attempted to assassinate President Betancourt of Venezuela, after 20 years of mutual enmity. In response to this the US pushed the Organization of American States (OAS) to break diplomatic relations, suspend all arms trade and begin consideration of further economic sanctions. The sanctions were to be lifted only when the Dominican Republic ceased its threats to the exiles residing abroad. In the beginning of 1961, the OAS extended the sanctions to include petroleum, trucks and spare parts. The increase is only passed by a two thirds majority with Cuba and Brazil being the largest dissenters.

Almost five months later Trujillo was assassinated with suspected CIA involvement. However, his son maintained control of the country with the aid of his uncles who were generals on the joint chiefs of staff which he headed. They escalated the campaign to purge the country of all opposition. Six months later a US fleet appears off the Dominican Republic coast in support for Joaquín Balaguer who ousted the Trujillo family and took control of the country. In the

---

[1] Data are from the Economic Sanctions Data Set.

beginning of January 1962 the OAS sanctions were lifted when a provisional government was established in the Dominican Republic.

This case illustrates several aspects of an economic sanction. The basic cost to the Dominican Republic was 1.9% of its annual GNP. The US enjoyed a size superiority of 596 times that of the Dominican Republic. The sanctions are considered to have had a significant contribution to the full success in this case. Other contributions include the suspected use of covert operations by the CIA: Rafael Trujillo assassination; and a quasi-military operation: the presence of the US fleet off the Dominican Republic coast. Thus the case includes measures other than economic sanctions. International cooperation is apparent through the participation of the OAS while there was no other aid to the Dominican Republic from another nation with the intention of disrupting the sanctioning effort.[2] This example should not be used as a blueprint for sanctions, for as mentioned above, there is no real *standard* for sanctions. It should be used, however, as a reference point or an aid to understanding sanctions while reading this thesis.

Economic sanctions have a long history, one that goes beyond what will be discussed here. Figure 1.1 shows how many sanctions were concurrently in effect annually (The horizontal axis shows years in the 1900's). There has been an almost constant increase in sanctioning.

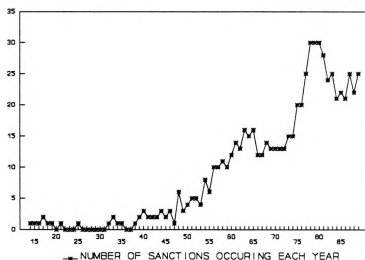

FIGURE 1.1 Concurrent Sanctions

[2] Hufbauer, Gary Clyde Jeffrey J. Schott and Kimberly Ann Elliott <u>Economic Sanctions Reconsidered: Supplemental Case Histories</u>, 1990, Washington, D.C.: Institute for International Economics, pp. 182-186.

> The attempt to use economic sanctions as an instrument of policy to induce an offending government to change its conduct and thereby resolve or help to resolve the international problems created by it is an essentially twentieth century phenomenon. States since time immemorial had interrupted commercial relations...[But] It was not imagined that economic measures falling short of a blockade could have decisive effects.[3]

The only effective way to sanction before the Twentieth Century was to impose a blockade, which required a great deal of force and was rarely successful. Also, blockades are typically thought of as military actions; certainly if a nation is attempting to cut off the life blood of another nation, it is considered a militant act. This changed as the world began to move from a state of autarky to one of trade and eventual interdependence. This turnaround appeared about the time of the industrial revolution.[4]

After the First and Second World Wars the interdependence among nations increased, especially within the East-West blocs.

> Growing international economic interdependence has been a second circumstance encouraging the resort to external economic coercion. Foreign trade and the flow of capital among nations have expanded significantly in the post-war period and have generated vulnerabilities that would have been absent in a world of greater autarky.[5]

This growth, as defined by Nincic and Wallensteen, has had a positive effect on the increase of sanctions over the years. What has become apparent since 1914 is both the increase in the number of sanctions running concurrently (Figure ONE), and the number of sanctions enacted in a given year, (Figure 1.2). As one can see there is a significant increase in sanctions since the end of WWII. The use of sanctions during the Cold War obviously increased due to the dangerous nature of the world arena. The US and the USSR found it safer to impose sanctions on each other than to engage in militarized conflict. Also, during this time the lines between allies and enemies

---

[3] Renwick, Robin <u>Economic Sanctions</u>, 1981, Rensselaer: Hamilton Printing Company, p. 4.

[4] Doxey, Margaret P., <u>Economic Sanctions and International Enforcement</u>, 1971, London: Oxford University Press, p. 15.

[5] Nincic, Miroslav and Peter Wallensteen eds. <u>Dilemmas of Economic Coercion: Sanctions in World Politics</u>, 1983, New York: Praeger, p. 2.
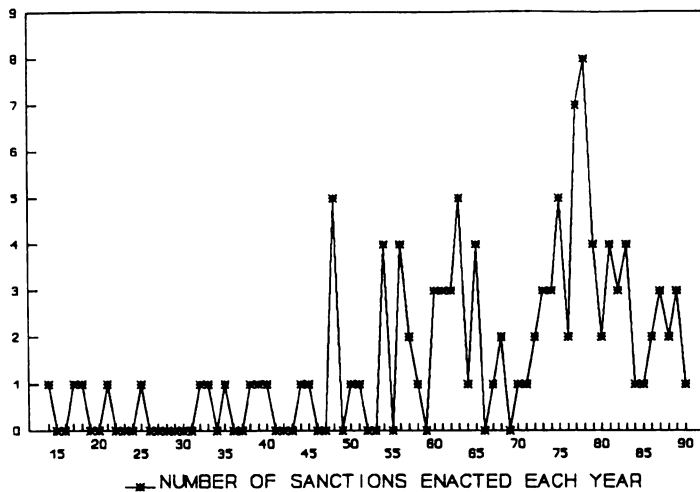
FIGURE 1.2 Enacted Sanctions

were rather well marked, allowing for clear definitions of who should be sanctioned. The sanctions against COMECON are an example of the Cold War effect.[6]

One would then expect that with the ending of the Cold War we should see a significant decrease in the number of sanctions being levied. Although it is too early to tell, there has been somewhat of a decrease in concurrent sanctions world wide. There is a rather convincing counterpoint to this, raised by Fukuyama's paper *The End of History*. Simply, he argues that the end of the Cold War has ushered in an era of military peace and no new ideologies, only to be replaced by economic warfare and democracy. This certainly would not predict a decline in the number of sanctions imposed, in fact the opposite would be true. Along with the arrogance required to believe that in this century we have created the highest form of government possible, democracy, the main tenets of *The End of History* argument are wrong. This can be seen in the eruption of the Gulf War, and all the *little* wars that are beginning to divide nations into ethnic blocs, i.e. Yugoslavia etc. Violence is not on its way to extinction, it is strong and thriving.

The one point of Fukuyama's that does have some validity is that there is an increase of economic warfare. The world is quickly dividing into economic blocs, while the established military blocs are quickly disbanding. Blocs like the EC have already opened their markets internally, but have closed much of them off to the outside. It seems that economic sanctions as

---

[6] Nincic and Wallensteen, 1983, p. 2.

a part of this economic warfare could soon follow. Since economic sanctions may increase in the future, their study is an important one.

Another reason for studying sanctions is their poor success record. Although sanctions have increased over time they have not become more successful. Instead there is a randomness of the success of sanctions when viewed over time, as shown in Figure 1.3. Which

_•_ SUCCESS MEASURE OVER ALL CASES
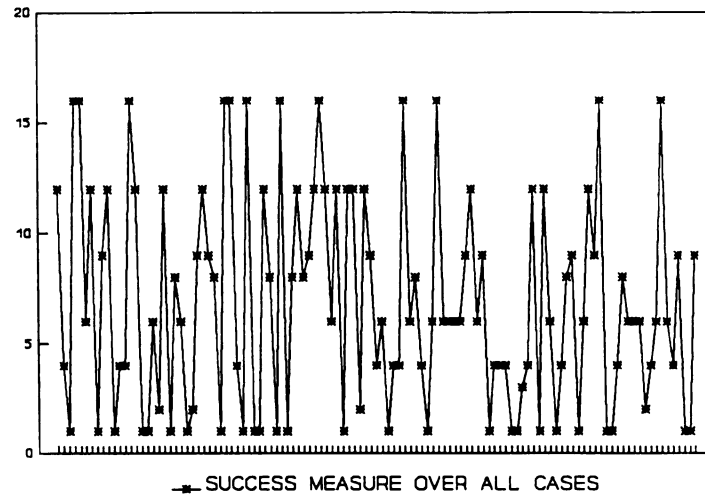
FIGURE 1.3 Success of Sanctions

depicts the measure of success as determined by Hufbauer, Schott and Elliott. In this data sanctions are rated on two separate four point scales, one for the success towards the goal and one for the overall contribution of the sanctions (1-8 equates with failure while 9-16 with success).[7] Although the success of sanctions is seemingly random, over time there are many other factors that can be studied to determine what could be causing success. This is exactly what Hufbauer et al have done in Economic Sanctions Reconsidered: History and Current Policy. They use a case analysis format to attempt to understand what makes economic sanctions tick. They conclude with what they call *nine commandments*, or results of their study.[8]

1. *"Don't Bite Off More That You Can Chew"*: Sanctions that attempt to make great changes in the target's policies often fail, less ambitious plans succeed more often.

---

[7]This operationalization will be discussed later, see Hufbauer, Gary Clyde Jeffrey J. Schott and Kimberly Ann Elliott Economic Sanctions Reconsidered: History and Currant Policy, 1990, Washington, D.C.: Institute for International Economics, pp. 41-42.

[8] All of the nine commandments can be found in: Hufbauer, Schott and Elliott, 1990, pp. 94-105. A full discussion of Hufbauer et al's work and results will be presented later.

2. *"More Is Not Necessarily Merrier"*: International cooperation is not that important for success, "In most cases, multilateral sanctions are not associated with success."[9]

3. *"The Weakest Go To The Wall"*: Weak nations, especially those under distress, succumb to sanctions much more often. This includes the idea that the sender to target ratio has a strong effect, that is, the more skewed the fight, the more likely the sender will win.

4. *"Attack Your Allies, Not Your Adversaries"*: Sanctions levied against friendly nations are much more likely to succeed.

5. *"If It Were Done, When 'Tis Done, Then 'Twere Well It Were Done Quickly"*: Overall, failure is associated with longer periods, and vice verse.

6. *"In For a Penny, In For a Pound"*: The more intense the cost to the target, the more likely the sanctions will succeed.

7. *"If you Need to Ask the Price, You Can't Afford the Yacht"*: Sanctions that are costly to the sender often fail.

8. *"Choose the Right Tool For the Job"*: Supplemental policies, (military, quasi-military and covert) can often enhance the probability for success.

9. *"Look Before You Leap"*: Sender nations should consider the consequences and expected outcomes before they impose sanctions.

This thesis quantifies the work of Hufbauer et al by creating the Economic Sanctions Data Set from their published case histories.[10] The format of this thesis is straight forward. Following this introduction, a literary review of 7 different scholars is undertaken, showing the development of theory about sanctions since the pre-WWI era. The authors are chosen for their ability to characterize the different types of theory as well as having an interesting focus. Following the literary review is the analysis and critique of Hufbauer et al's work. In this work, Chapter IV consists of the quantitative model. Here the model is formalized, the variables defined and a list of expected outcomes set out. Next, the statistical results are presented and problems with the model discussed. Lastly, in Chapter VI, there is a discussion of the policy implications and

---

[9] Hufbauer, Schott and Elliott, 1990, p. 95.

[10] The case histories are found in Hufbauer, Schott and Elliott, 1990, and Hufbauer, Schott and Elliott, 1990, Supplemental Case Histories.

conclusions. This also includes a discussion of possible improvements on the research as well as other paths that can be taken.

Chapter II:
Literature Review

Idealists and Realists

The purpose of this review is to give the reader a sense of the background of economic sanctions; their legacy, if you will. During this process different scholars are examined for their theoretical tradition pertaining to economic sanctions and their specific focus on sanctions. This should serve as an introduction to Hufbauer, Schott and Elliott's work, allowing for a better understanding of it. It is not an attempt to formulate a separate comprehensive theory, although in the conclusion a suggestion is given for further work, and possible theories.

Most of the literature on economic sanctions falls into two broad categories of international relations: the Idealists and the Realists. Like international relations, the Idealists form the foundation for the other paradigm and as such have the longest history. In addition to these two traditions the Cold War is discussed due to its profound influence on the study of economic sanctions.

One important point to watch for is the focus of each scholar. All the literature on sanctions, regardless of its theoretical foundation, explores the success/failure of sanctions. That is, the focal point is why sanctions succeed and fail, *not* why they occur in the first place. This shall become apparent below.

Idealism

The Idealists are the oldest of the two theoretical traditions, dating back to the 1880's.[11] They focus on morality, legality and the universality of international organizations. "...there are important differences between economic measures used as techniques of warfare [economic warfare]... and economic sanctions employed by an international organization as part of a

---

[11] Sanctions actually go back to Thucydides' times as he looked at economic sanctions. However only recent history will be discussed here.

constitutionally authorized enforcement process."[12] This typifies the Idealist. The distinction between economic warfare and sanctions is made by others subscribing to Idealist theory. The focus on international organizations is not a derivative of Neo-Institutionalism, instead it is the qualifier for legality and morality. This can be seen in Idealist studies where the cases used as evidence consist purely of UN and League sanctions.[13]

In the modern era, Idealist theory has a long history dating back to the end of the First World War. In pre-WWI history, the conceptualization of sanctions was one that saw them as a useful tool to be instituted by a group of nations in the world arena. There was one main codicil to this: neutral nations could withdraw from being considered as part of a sanctioning coalition.[14] That is, if the European nations decided to sanction a country, there was no obligation for other nations, including allies, to support or even respect the sanction. Notice the morality or idealism that is implicit but obvious here: only wronged nations would participate, others remained neutral. The concepts of Realism have no place in this setting.

World War I was considered so devastating in both battle deaths and the failure of the balance of power system that a modified theoretical perspective on sanctions arose. This new "paradigm", as Daoudi and Dajani call it, is one that saw sanctions as a response to one evil nation victimizing a benevolent nation, the lines between good guy and bad guy were clear. In addition to this previously accepted view all nations were expected to act selflessly in an effort of *collective security*. This was promoted primarily by the Geneva School of Thought.[15] They argue that the Geneva School's idea of full responsibility for world security made a distinct imprint on the forming of the League of Nations. But the old concept of neutrality had not yet died, so when

---

[12] Doxey, 1971, p. 14.

[13] For example see Doxey, 1971, and Doxey, Margaret P. International Sanctions in Contemporary Perspective, 1987, London: Macmillan Press Ltd. and Daoudi, M. S., and M. S. Dajani Economic Sanctions: Ideals and Experience, 1983, London: Routledge & Kegan Paul.

[14] Daoudi and Dajani, 1983, p. 18.

[15] Daoudi and Dajani (1983), pp. 20-28.

the US did not join or support the League, it failed and subsequently WWII transpired. This failure set the Geneva School's paradigm in motion: *universality* was pushed from the theoretical into real policy implementation. The UN's ideals reflect this as does the high enrollment in it.

Thus, the Idealistic concept that economic sanctions were an instrument to maintain the world order emerged as the dominant theory. It was held that their use, which was not as destructive as war, could keep all nations within the bounds of the international norms, the idea that sanctions truly worked. Around the 1960's this began to be questioned, and a new theory was being developed by the Realists. This group started to dominate in the 1980's as the literature points out. Although there are many questions within it which are discussed below, the Realist paradigm is presently dominant.

The above is laid out in Daoudi and Dajani who take a Kuhnian perspective of sanctions, citing that there are two paradigms to be studied, the pre-WWI paradigm and the Geneva School's. This stretches the definition of a paradigm. Sanctions occupy a very small area of study, and are part of a larger paradigm, that of international relations. To say that the study of sanctions has undergone its own personal paradigmatic shift is giving the area too much independence. A better study, one that would be far more accurate, would be to look at how the shifts in international relations have affected the sub-field of sanctions. For example, it is far more accurate to say Idealism, Realism or Neo-Institutionalism are paradigms, than it is to say sanctions are. It would be better to call the different views of sanctions *theories*; I have done so here.

A second problem with Daoudi and Dajani's paradigmatic shift is the lack of shift that took place. When comparing the two *paradigms* (Pre- and Post- Geneva School) one is hard pressed to see much of a difference; in fact the only one is the idea that neutrality/universality. The pre-Geneva School believed in neutrality while the Geneva School saw neutrality as the cause of past failures. The consequence of this *shift* is the increase of importance on moralistic, legalistic and especially universal sanctions. That is, as the importance for universal participation in the

levying of sanctions grew, so did the need for moral grounds on which to levy them. The three considerations interacted with each other, intensifying their importance.

Realism

The Realist sees sanctions as means of a nation-state to enforce its will and promote its security. This view is diametrically opposite to the Idealist who takes legal and normative questions into account while the Realist only looks at what is the best method for a country to survive and prosper. This mode of operations is certainly more scientific than the traditionalist because questions of what are just and unjust sanctions are ignored, leaving the researcher much more room for objective analysis. Truly, one can argue that no view is objective, some are more than others, and this is the case between the Realist and the Idealists. This is more fully argued later.

The review of David Baldwin provides an example and full discussion of Realist theory. But first, a few remarks must be made concerning it. There are two types of Realists with reference to sanctions: first, those who believe sanctions are futile policies that cost the sender country dearly and whose success rate is pathetic at best; secondly, those who view sanctions as a viable option in international relations. The doubting types began discovering evidence in the 1960's that found sanctions to be rather ineffective.[16] This continues today. The basis for this conflict of opinions centers around what the sanctions are expected to achieve. That is, what is the goal of the sanctioning effort: punishment, policy change, domestic rallying etc. This debate is Baldwin's primary focus and as such is discussed then.

The Cold War Influence

As the Cold War locked its protagonists into two rival military blocs, and as the potential costs of their confrontation grew, economic coercion became a less perilous manner of fighting the East-West conflict.[17]

---

[16] For a sample list and quotations of those scholars see Daoudi and Dajani (1983) pp. 43-48.

[17] Nincic and Wallensteen, 1983, p. 2.

This statement fundamentally represents the Cold War influence on economic sanctions. The development of the nuclear arsenals and possibility of nuclear holocaust made the actual thought of an hot war more deadly than ever before. Fear of escalation through direct military confrontation led to the use of less direct measures such as military aid to third world countries and economic sanctions. The sanctions provided a manner in which the East and West could jab at each other without risking escalation to full scale war. Many of the theorists writing at this time take this approach to sanctions, comparing them as an option to military warfare.

The consequences of the Cold War influence are twofold. First the scholars tend to view sanctions as an all or nothing option, not something that can be imposed incrementally. Although some of the scholars do not always take this to heart it is a common trend. The second influence is to think of economic sanctions as a substitution for military actions, this is an inaccurate view of sanctions. The only similarity between economic and military force is that they both are tools of the nation-state, their likeness ends there. Economic sanctions have both the capability of punishing, showing disapproval and garnering domestic and allied support. They are a less drastic resort to action as compared to military actions, and more severe than diplomatic sanctions. Because they are not on the same scale of severity, one can not say that the two, military and economic sanctions, are substitutes for each other. This is not to say they cannot be used in conjunction with each other, in fact slightly over a third of all sanctions were imposed in combination with military action.[18]

One interesting incongruity must be noted in the Cold War theory. Sanctions were seen as a substitute for military confrontation, one to be used to avoid escalation. But sanctions to a theorist writing under the influence of the Cold War are a full scale operation, they aim to be as destructive as possible.[19] One would expect that full scale sanctions of this type are the most

---

[18] Data are from the Economic Sanctions Data Set.

[19] For a full discussion of this see: Deese, David A. *The Vulnerability of Modern Nations: Economic Diplomacy in East-West Relations,* found in Nincic and Wallensteen, 1983; or the description given in the analysis below.

escalatory as it intends to devastate the target's economy. That is, punishment is applied in such a manner that little room is left for a subtle reaction by the target. The only options left to the target are capitulation, resistance and full scale retaliation. Of these, retaliation would be the be expected if the target refused to capitulate since it had been backed against a wall. The only explanation I imagine is during the Cold War neither East nor West actually intended to severely damage the other, or more likely if the intention did exist the capability did not. For example, the actual damage inflicted on the Soviet Union, as a percent of GNP, by the Western sanctioning of COMECON was nil.

Margaret Doxey

Margaret Doxey, in both of her books, is exemplary of the Idealist scholar of economic sanctions. The basic question she attempts to answer is not very clear as the books are a general look at the history, types and composition of sanctions. She does not develop a theory as such, but she does come to some conclusions in the books; these act as a surrogate theory, however, they are really the results inquiry. The nation-state is the level of her analysis, and she sees the international arena as one that was once in a state of anarchy, but is developing into one where international organizations are in control.

There is a problem with using the nation-state as an unit of analysis: it is rational, and quite possible for a government to enact sanctions against an opposing nation for the purpose of bolstering internal support for their regime. An example is the standing declaration of war Libya has maintained against the US for many years. It is totally unreasonable to believe that they intended to actually attack the US, what is reasonable however, is the use of the declaration as a method of rallying the masses around Qadaffi. Similarly, the sanctions the US imposed on the Soviet Union over the Afghanistan invasion were not wholly to push the USSR out, but to gather the popular support of the people and as proof of the resolve against the Warsaw Pact for the sake of the US's allies. Thus, there are many aspects to sanctions; the reasons for their implementation are rarely as clear cut as Doxey theorizes.

This idea that a nation may engage in sanctions or other types of international activities principally to affect the domestic politics of their nation is brought up by Ronald Rogowski.[20] In attempting to analyze what effects international trade has on domestic politics he used the idea of comparative advantages and a theorem that states while protectionism benefits the scarce factors it harms abundant ones (and vice verse). That is to say, while a scarce factor will benefit from trade policy "x", abundant factors will suffer. Conflict will appear along these lines, which are delineated into capital, labor and land. Regardless of its faults, Rogowski has brought an interesting point to bear, international affairs can play an integral part in domestic politics.[21] This is the fundamental problem with taking the approach that Doxey does, the same approach that most scholars take.

To play Devil's Advocate I will now defend the nation-state as a unit of analysis. By focusing on the nation-state one is allowed to disregard much of the often messy details involved in each different nation, e.g. type of political system, strength of ruling regime etc. This allows one to focus on the aspects of international economic sanctions common to all nations, such as Hufbauer et al did, and I have when testing their results. Both levels of analysis are useful, the decision is dependant on what the study is attempting to accomplish.

By focusing as she does on universal sanctions, Doxey limits her ability to form any conclusions that go beyond those sanctions imposed by the League, UN or a large multi-lateral group such as NATO. That is, she is forced to focus on sanctions that were imposed under full international cooperation. She points out there are several different reasons that international cooperation is difficult to attain, and as such how sanctions are difficult to attain:

> Collective action which involves the commitment and diversion of national resources will be easier to organize if the overriding policy goals of a group of

---

[20] Rogowski, Ronald Commerce and Coalitions: How Trade Affects Domestic Political Alignments, 1989, Princeton: Princeton University Press.

[21] Rogowski's analysis is flawed in many ways, primarily the idea that people will organize along factors lines, i.e. capital, labor and land, and not along industrial lines.

> nations happen to coincide. ... Much more common are cases when collective
> action appears to conflict with national goals...[22]

This is the problem of consensus, as Doxey defines it; otherwise known as the collective action problem. She does not discuss the specific problems of collective action, namely differences in ideology or domestic vested interests. The second problem is a function of her level of analysis. The first problem, ideology, seems less important than other factors. This could be a result of the Cold War. That is, Doxey plays down the ideological problems because during the Cold War there were principally two ideologies. These allowed for cooperation only within their spheres of influence, East and West. Although this is a simplified statement about the ideological beliefs at that time, a common enemy such as the Warsaw Pact improves cooperation for the opposing side.

Doxey cites the next problem as the question of goals: the sender nations must decide what their goals are. This does not create the same type of problem as the collective action above, for according to Doxey the sole goal of any *true* sanction is that of peace keeping. Once again the moral aspect of Idealism inhibits the researcher. Her definition of sanctions include only ones enacted by international organizations against a *wrong-doer* nation. Thus, her question of goals concerns not "The objective of peace, or of rectifying a situation which threatens peace..." which is obvious to her, but "In the first place, the nature and circumstances of the crisis will determine specific final goal, while the tactical decision to use a certain form of coercion will establish intermediate goals."[23] This strict definition causes a great deal of problems because it limits the researcher to sanctions that are universal, legal and *just*. All of the times coercive economic power is used by only one nation the researcher may not consider them sanctions and is left blind. In fact, according to Hufbauer et al's qualification, most of the sanctions are put in place by one

---

[22] Doxey, 1971, p. 90.

[23] Doxey, 1971, p. 92.

nation.[24] As seen throughout this thesis the limitations set in place by the conventional tradition are so stringent that they act as blinders to the scholar.

The next problem in sanctioning a country is the selection of measures. Doxey again concentrates on the legally allowable sanctions according to the League and UN in their respective periods. But here she takes an interesting turn, instead of fitting the punishment with the crime so to speak, she posits the idea that:

> Crucial factors influencing the choice of particular measures adopted singly or in combination would be the objectives sought, the vulnerability and sensitivity of the delinquent state, and the minimization of cost and damage to the sanctioning group.[25]

This is odd because Doxey uses a more utilitarian approach instead of a moralistic view. This can be explained by the fact that to the Idealist, policy change to preserve peace is the only goal of sanctions. They are not seen as punishment or methods in which to bolster domestic support. Thus, the Idealist uses a cost benefit analysis to determine what is the most efficient manner to preserve peace, but not to determine whether to sanction.

The next consideration, costs tot he sender country, follows directly from the last. These can be realized in both economic and political terms. One does not even have to regard counter measures by the target nation to understand this:

> American farmers were outraged by the partial grain embargo imposed by the Carter Administration after the Soviet intervention in Afghanistan. Mr. Reagan's campaign promise to lift the embargo was carried out once he was elected President, and it was not reinstated, in spite of his Administration's imposition of other penalties on the Soviet Union.[26]

This is an example of both economic and political costs, Reagan wanted the support of the farmers who had a strong lobby, as well as lowering the costs inflicted on that group. Thus the sender must take care in choosing which types of sanctions to impose, this is complicated by the problem

---

[24] Data are from the Economic Sanctions Data Set.

[25] Doxey, 1987, p. 98.

[26] Doxey, 1987, p. 101.

of universality. That is, many nations imposing the sanctions will be affected differently by sanctions, and will therefore have a difficult time in choosing *how* to sanction, they will all have different cost benefit analyses.

The last consideration is that of universality. This is the key part of any sanction in the Idealist tradition. Doxey points out that universal coverage of sanctions is more of an ideal than a true goal. She then moves to analyze what the UN can do legally to force others to comply to the sanctions. What is not questioned is the importance of international cooperation in the success of sanctioning, which should be a primary focus. Here again the Idealist is blinded by only looking at how to get cooperation, without bothering to answer whether it is needed or not. This is due to the normative approach. Thus, if the focus was changed from "why sanction" to "when they work" much more could be learned.

Robin Renwick

Robin Renwick strays from the Idealists as he attempts to answer the question of when sanctions will work, and why. He sees sanctions in a different light than Doxey. To Renwick, universality, morality and legality are not important. Also his theory is strongly influenced by the Cold War, as can be seen below where sanctions are perceived as part of a package of options:

> In deciding whether to impose economic sanctions, governments frequently find themselves responding to an international crisis on the basis of three broad options: (a) to do nothing; (b) to consider taking some form of military action; (c) to seek to impose economic penalties. A decision to impose sanctions may be taken less on its intrinsic merits than because of its attractions in relation to the alternatives.[27]

It should be noted that by comparing the three options above, Renwick implies they are interchangeable options, one of the basic tenets of the Cold War policies.

Renwick does rely on some of the Idealism in his work where he makes a distinction between economic warfare and economic sanctions. Economic sanctions are defined as: "...the imposition of economic penalties to bring about a change in the political behavior of the country

---

[27] Renwick, 1981, p. 1.

against which they are directed"[28] This is more utilitarian, or Realist, than Doxey due to the absence of the moral, legal and universal aspects on which she concentrates. He does however mention these as possible definitions that he chooses not to use. Economic warfare is not so well defined:

> In considering attempts to use the "economic weapon" it is necessary to distinguish between the application of economic sanctions and the more limited objective of halting trade in arms or other strategic materials.[29]

It is not clear what the difference here is; restricting military goods to a nation for strategic reasons also implies that the sender does not trust the target and a change in policy would be favored. This is no different than any other type of sanction which attempts a direct policy change. A somewhat better definition is one Renwick gives by example. He considers the "phoney war" that preceded WWII to be economic warfare, not economic sanctions. The difference here seems to be the hostile outcome that resulted as well as the goal of the economic measures: to weaken Germany enough to avoid war. This is still no different than any other sanction though, as it is an economic measure attempting to change the policy of another nation. The difference is the actual policy goal. Renwick's distinctions between the two, sanctions and warfare, are unneeded and as such only confuse the material while adding no additional information.

The unproductive distinction above does not follow through in the analysis, nor does it damage Renwick's work. He theorizes that sanctions can have the reverse effect than what is expected. That is, the target nation may be able to pull together and fight back against the sanctions as the sender countries offer a common enemy. This almost punitive view of sanctions does not go as far as saying they do not work. In fact, Renwick believes sanctions work to the point of effectively damaging the target nation, but this does not equate to the desired policy change. As a result economic sanctions are dependant on how they are imposed. According to

---

[28] Renwick, 1981, p. 2.

[29] Renwick, 1981, p. 59.

Renwick, if the sanctions are imposed with strength and purpose their chances for success are greatly enhanced, if not:

> Minor or petty sanctions are virtually certain to produce a reverse political effect without exerting any real pressure. ... A sanctions policy should never be based on the initial fallacy, which was the supposition that it would prove possible to deter aggression or otherwise to change fundamentally the political conduct of states by the threat or economic penalties alone. The implementation of sanctions is essentially punitive, the effect— if there is sufficient international support— being to weaken the country to which they are applied.[30]

This is the crux of his theory. There is little here that is surprising; one would expect sanctions that are applied *willy nilly* would fail. Renwick's work does point out two main ideas that are not so tautological. First, not only can the sanctions fail to be effective, but they can actually reverse their effectiveness and blow up in the sender's face. The second main point is what Renwick is fighting against. As mentioned in the historical overview, beginning in the 1960's a growing disbelief in the effectiveness of sanctions began. This was much more apparent in the 1980's when Renwick was writing. He is writing counter to this belief, and although the argument is not as strong as David Baldwin's, it does not buy into the belief that sanctions are impotent.

Johan Galtung

As a scholar, Johan Galtung does not fall into any of the theoretical traditions, rather he attempts to explain the reaction of the target country (receiver in his terminology) to sanctioning. His definition of sanctions, however, is Realist:

> ...actions initiated by one or more international actor (the "senders") against one or more others (the"receivers") with either or both of two purposes: to punish the receivers by depriving them of some value and/or to make the receivers comply with certain norms the senders deem important.[31]

---

[30] Renwick, 1981, p. 92.

[31] Galtung, Johan *On the Effects of International Economic Sanctions* found in Nincic and Wallensteen, 1983, p. 19.

He begins by looking only at "...*negative, collective,* and *external* sanctions, and like most other analysts we shall concentrate on the theory of *economic* sanctions."[32] His theory for how sanctions work is that of a simple economizing cost/benefit analysis: that is, the sender wants to spend as little as possible for the most effect. He does not go much further with this general part of his theory; in fact, this functions as his base assumption.

Galtung explains his theory by comparing it to what he calls the *naïve theory* of sanctions. As he defines *naïve theory* it explains political disintegration of the target as a function of value deprivation, brought on by economic sanctions.[33]
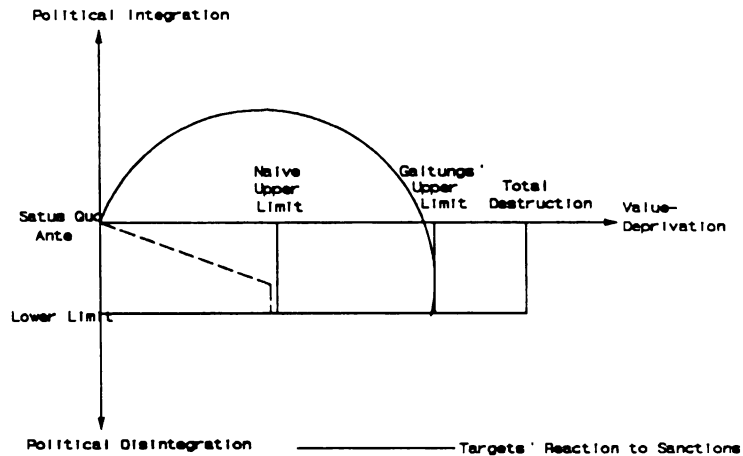
FIGURE 2.1 Galtung's Theory

According to *naïve theory* one would expect a direct linear relationship between the pressure put on a country and the time it takes to fall. Galtung creates a revised theory that predicts the first reaction to sanctioning will be a more determined resistance in the form of political integration, followed eventually by disintegration if deprivation is increased. This is shown in Figure 2.1.[34] Both the naïve view, the dashed line, and the revised theory, the solid arc are shown here. The revised theory expects the initial resistance to occur because of internal adaptation. There are three conditions for this to occur: first economic sanctions must affect the entire nation, so those who are not in favor of the targeted policy will feel unjustly punished, pushing them to support

---

[32] Galtung, found in Nincic and Wallensteen, 1983, p. 21.

[33] Galtung defines economic sanctions as a type of warfare, this has been ignored so to avoid using too many different terms. As such, value deprivation is caused by all types of warfare, economic, military etc which leads to political disintegration.

[34] Redrawn from the original: Galtung, in Nincic and Wallensteen, 1983, p. 28.

the policy. Second, the people have no attraction to the sender, or they dislike the sender, therefore they will be even more likely to side with their own government. Lastly there must be a strong belief among the people that they are in the right. Galtung theorizes that if these three conditions are met there will be a strong resistance to the sanctions.

Much of this has psychological underpinnings. Galtung argues that sanctions are much like a prison sentence, the criminal rarely feels as though all of him is to blame for the crime and yet all of him is being punished. The same applies for the target country, not all the people are to blame yet all are being punished. The prison metaphor is expanded by viewing the target as "...an organism with a certain self-maintaining potential."[35] Although this is interesting and surely somewhat true, Galtung does not seem to feel a need for a leakage into the target country. His organism theory predicts that a nation could go from relatively free trade to autarky and survive just by its society adapting to the change. This is overstated. Galtung does realize an upper limit where the nation would fall before total destruction.

Galtung's main conclusion is not that sanctions will not work, rather, that it is understandable that sanctions do not often work given the adaptable nature of nations. Each nation is different in this ability; the more diversified a nation, the more readily it can adapt. Also, the more universal and severe the sanctions, the more a nation will have to adapt, and the less likely it will be able to, as it reaches the upper limit quicker. But this does not mean a nation is sure to fall just because near universal sanctioning exists; it can still adapt. Thus, the strength of the organism is the true determinant of the success of nations, according to Galtung.

Jerrold Green

> These sanctions originate within the international economic system, and while not denying that "organisms have a certain self-maintaining potential", we must also recognize that no degree of self-reinforcement will produce needed commodities which might be denied a target state. In the throes of economic sanctions, it is

---

[35] Galtung, found in Nincic and Wallensteen, 1983, p. 46.

unlikely that *joking, mysticism,* or *conspicuous sacrifice* can produce desperately needed fuel or food without which a society cannot exist.[36]

Jerrold Green's attack on Galtung is along the same lines as the critical comments made above. Green's primary critique of Galtung centers on his *stress* on the organism adaptation idea. He counters with a theory explaining the failure of sanctions from a much more economic view. He states two main ideas in reference to the target's reaction. First, the demands of the sender nations are often so austere that it is cheaper for the target to resist the sanctions and attempt to survive them than actually give in and lose power. This is true in the cases where the demands essentially equate the dismantlement of the target's power structure.

Second, regardless of the severity of the sanctions, and how many nations are engaged as senders, the target can still circumvent the effect by finding *one* nation from which to buy and sell.[37] This is what Hufbauer et al call the *black knight effect,* one black knight nation can effectively render a multi-lateral sanctioning effort useless. This is a type of economic adaptation, the target seeks out and finds new markets, for without them it would be unable to exist. There have been cases where it was actually profitable for the target to have sanctions imposed on it, the most prominent case being that of the 1978 Arab League sanctions on Egypt for signing the peace treaty with Israel. Egypt gained an average of $77 million annually for four years because they were able to sell oil to the Israelis, a new market. This is something Galtung misses because of his concentration on political integration. The economic adaptation by a country can add new markets which in turn can bring in more businesses fostering support for the dominant regime.

A criticism of Galtung that Green misses is the question of actually how important political integration is within a country. If the target country is a democracy where the people's voices make a difference and their opinions are formed independently from what the government

---

[36] Green, Jerrold D. *Strategies for Evading Economic Sanctions,* found in Nincic and Wallensteen, 1983, p. 64.

[37] This does not include universal sanctions which have only been enforced once, against Iraq in 1990-1991.

wants, then integration would be very important. But in a nation where the only news people get originates from the dictatorship, sanctions will have much less effect because the government has control of their beliefs. Thus, who cares if sanctions take effect against a nation full of peasants who don't know the difference between government repression and economic sanctions when it comes to answering why they are starving.

Green's analysis is far more persuasive than Galtung's because he uses both the ideas from the organism theory and the economic analysis of how a nation can survive and even prosper under sanctions. Although it is a simple test, one can compare the organism theory to Green's by applying them both to the Arab League v. Egypt. Galtung would be unable to answer the question of why they prospered, only why the sanctions did not work. But Green could answer both questions, and more accurately. That is, Galtung would say that the nation experienced increased political integration, but this is doubtful as most Muslims hate the Jews, and as such would not be very likely to support their government. Galtung's three criteria are violated, regardless of who was affected by the sanctions; the Egyptians certainly had more attraction to the brother Arabs than to the Israelis, and they were not wholly convinced that their cause was right, as Sadat's assassination testifies. Thus, Galtung would be at a loss. Green on the other hand would note the new oil market and could bypass any need to speak of political integration. This is a much more plausible answer.

David Deese

> At Least since the dawn of the modern nation—state in the 1500's, wealth and power have been the most prominent and interactive of national objectives. ...In the twentieth century economic sanctions have become a tool of diplomacy and warfare. Yet, carefully conceived and well executed economic diplomacy, or its avoidance when appropriate, remains the exception rather than the rule in international relations.[38]

As one can see above, David Deese comes from the Realist Tradition and discredits the current effectiveness of sanctions. Deese does not discount their use, saying they are ineffectual

---

[38] Deese, David A., found in Nincic and Wallensteen, 1983, p. 155.

tools of foreign policy; rather it is in the manner they have been used that renders them impotent. He then engages in a brief analysis questioning what will make them effective.

Deese uses two helpful concepts to understand the effectiveness of sanctions. First is what he calls *Comparative Economic Leverage,* which is the same as a comparative advantage in trade only it considers what countries have and need. For example, Japan is disadvantaged in food production compared to the US, thus we could seriously damage the Japanese by halting all food stuffs exported to them, just as the OPEC could damage just about any country in the world by halting oil exports. This type of economic sanction is meant to be the most damaging and destructive to a country and thus most likely to succeed.

There is a draw back to this type of sanctioning: it has escalatory properties. The truly useful aspect of economic sanctions is their variability; that is, they can be instituted on many different levels, both extreme and temperate. Only using those sanctions which are the *most effective* at damaging a country one could actually cause that nation to attack militarily. Thus, although the concept is useful there are many times when sanctions are not meant to be full scale attacks on the target's economy. Since 1914, 33% of the sanctions levied have been against nations which were on friendly terms, thus it was allies sanctioning each other. Deese misses this point due to his concentration on sanctions directed at enemies only.

The second point that Deese makes is that sanctions are not always aimed directly at the target's policies but aimed at showing resolve to the sender's allies. Thus, the possibility of third party consideration enters into the picture. There are two possible considerations that could weigh on the sender country: the first is mentioned above, the idea of reenforcing allegiances; the second is the possibility of creating a reputation among other nations so that in the future only the threat of economic sanctions is necessary for changing the policies of the target. This point Deese does not touch on directly, but one can see how it relates to the third party influence.

Keying into this last point is the idea that sanctions are not always meant to change a policy, they could be targeted for one of the options mentioned above. Sanctions can be meant

to not only coerce the target to shift a policy but "...to punish, discredit, or embarrass."[39] Here it is understood that sanctions can take on a myriad of different functions, which runs somewhat contradictory to the idea of effectively damaging an economy. This is an interesting contrast, one that does not have an answer. Deese seems to take both sides of the argument implying that sanctions are both an all or nothing ordeal, and they are also meant to punish, discredit, etc. One would not think that sanctions only meant to embarrass would be implemented with the same level of severity and determination as ones aimed at changing an hostile policy.

Taking the best from Deese, the idea of *Comparative Economic Leverage*, the range of sanction severity and using the third party as a possible influence for the decision to employ sanctions. By doing this the researcher is allowed to visualize the entire range of use for sanctions as well as why they are used and when they may be the most effective. These ideas feed right into the last author, David Baldwin.

David Baldwin

David Baldwin's theory, found in <u>Economic Statecraft</u>, depicts for the Realist what Margaret Doxey does for the Idealist. He argues that international economics should be viewed as part of national foreign policy:

> ...not a bizarre, abnormal, nonroutine, extraordinary, unusual occurrence, but rather a normal routine, everyday, ordinary, commonplace activity. Power relations infuse every aspect of social life; there is no reason to make an exception for international economic relations.[40]

This point is crucial to the study of economic sanctions because Baldwin is arguing against those theorists who believe that sanctions are impotent while at the same time making a stand for the Realist perspective. That is, Baldwin is not interested in the moral, ethical or legal questions of the Idealists. Instead he finds the utility of economic statecraft a method of exercising power in order to preserve national security.

---

[39] Deese, in Nincic and Wallensteen, 1983, p. 156.

[40] Baldwin, David A. <u>Economic Statecraft</u>, 1985, Princeton: Princeton University Press, pp. 60-61.

Although Baldwin defines economic statecraft in general terms: "*Economic statecraft* refers to influence attempts relying primarily on resources which have a reasonable semblance of a market price in terms of money."[41] I shall use this synonymously with sanctions. Actually sanctions are a subset of statecraft, which can include foreign aid, import and export controls etc. Everything said about statecraft applies to economic sanctions; for this reason they will be treated synonymously.

His position on diplomatic, economic and military statecraft is that they are part of a state's instruments used to maintain itself. "Neither war nor economics can be divorced from politics; each must be judged as an instrument serving the higher goals of the polity."[42] There is no reason to separate any of these tools from politics as they are inexorably intertwined. Baldwin finds this to be the first reason for scholars nay-saying sanctions: they do not see economic statecraft as foreign policy measures, instead they focus on economic statecraft as international economics, i.e. trade policy etc. Once sanctions are seen as international economic relations and not deliberate foreign policy goals they can fall into what Baldwin calls *low politics*, "...dealing with such mundane and unimportant matters as trade and investment."[43] In so doing the researcher cannot fully understand the proper setting in which to study sanctions. Along the same lines Baldwin argues that statecraft is power, that is, it characterizes a nation's power. This includes all types of statecraft: "Economics as a separate science is unrealistic, and misleading if taken as a guide in practice. It is one element—a very important element, it is true—in a wider study, the science of power."[44] Once again the study of Realist *type* issues are favored over the legal and moral dilemmas of the Idealists. It is not the moral/legal issues that drive nations, it is the quest for power, the power that will insure their survival and success.

---

[41] Baldwin, 1985, pp. 13-14.

[42] Baldwin, 1985, p. 65.

[43] Baldwin, 1985, p. 61.

[44] Russell, Bertrand Power: A New Social Analysis, 1938, New York: W. W. Norton, p. 135.

Baldwin's second critique of the nay-sayers, or reason they come to erroneous conclusions, is that statecraft has a multitude of ends and means, not just one. "Means-ends analysis is complicated by the fact that very few ends are ultimate or final values; most are intermediate or instrumental in some sense."[45] Those analysts who attempt to simply use an ends-means analysis to determine success of an economic venture will often find it to be a failure because of the many different ends that can be studied. For example, if Nation A sanctions Nation B, is it a success only if B changes its policies; or perhaps if C and D, A's allies, are reassured that A will maintain its alliance to them; or if E and F, two nations planning policies similar to B's, are deterred from doing so.[46] All of these are possible and as such the desired result of a sanction is not easily detectable.

This keys in on another point: reputation in the international arena. "Images matter. Statesmen care about how policy makers in other countries perceive their capabilities and intentions. Economic instruments can be—and have been—used to affect images."[47] As Deese alluded to in his work, the concept of reputation is vital to economic sanctions, an end that is not easily determined. As mentioned above this is one of the main causes of sanction nay-saying. Thus, Baldwin's entire argument is focused on the study of economic statecraft as a part of foreign policy, in arguing for this end he concludes with nine interesting ideas.

First, as discussed above, there are usually many targets and ends that a policy will aim for. Second, "*Success is a matter of degree.*" It is not often the case that sanctions, or any type of statecraft, are dichotomously a victory or defeat. The Gulf War is a good example: immediately following the collapse of the Iraqis, it was believed that total victory was ours, but now it is apparent that although we won, there are still many of the problems that were there when the war began. Third, alternative policy choices to economic statecraft are important. It is easy to

---

[45] Baldwin, 1985, p. 16.

[46] These confusing *alphabet nations* point out that real world sanctions are complex affairs as well.

[47] Baldwin, 1985, p. 101.

say that one type of policy will be ineffectual, but a much different thing to find a policy that will work. Fourth, "A moderate degree of success in accomplishing a difficult task may seem more impressive than an high degree of success in accomplishing an easy task." Fifth, as mentioned above "*Images matter.*" Sixth, "*The bases of power are many and varied.*" This point addresses the concept of power fungibility. Just as military power is not fungible across many areas, such as protection of endangered species, neither is economic power.

Seventh, it is not always helpful to compare costs of the sender and the target. Even though the sender may loose twice as much as the target, there still could be total success, and even a net gain. This could occur because the target's economy may not be in a position to loose much while the sender's economy is in such a position. The US could loose a great deal if it imposed sanctions on the member countries of OPEC, but if the sanctions were successful, then the long run could benefit the US This relates directly to the idea of multiple goals, the cost to a sender could be tremendous, but not compared to the reputation it can develop. Eighth, "*Imposing costs for noncompliance is a measure of success.*" That is, just being able to punish a country for noncompliance by causing it economic damage is successful as the sender has shown resolve, power to influence and dissatisfaction. Lastly, and related to eight, "*Costs have their usage.*" Thus it is useful for the sake of reputation to show that you are willing to pay the price to impose a sanction.[48]

Baldwin's theory of economic statecraft is far more systematic than the Idealist tradition because it ignores the moral, ethical and legal grounds of sanctions and concentrates on the economic and political aspects. This makes much more sense because nations do not enact sanctions for ethical reasons, they do it for reasons of power and national security. This may sound cynical, but in fact it is irrational to enact a sanction that will impose heavy costs on the sender without having any net benefit. In cases where morality seems to be the cause of the

---

[48] All the above quotes may be found in Baldwin, 1985, pp. 371-372.

sanctions I suggest looking for other reasons, as Baldwin points out, there are many possible targets.

This is not to say that the Realism school is the best option, or that Baldwin subscribes to it wholly. International organizations play a key role in facilitating the relations between nations, and should not be discounted as much as the Realists do. Instead a union of the two should be adopted, much like Baldwin has done. These ideas are more fully developed in the last section where possible theories are considered.

Problems defining economic sanctions

A major question which has remained unanswered through the literary review is: *what is really the definition of economic sanctions?* This is not easily answered, but an attempt is made to do so here. Kim Richard Nossal addresses this point, and lays out an argument contending that sanctions are international punishments for some sort of wrong doing. This brings us curiously back to Doxey and the Idealists for whom moral grounds were needed to make economic sanctions anything more than coercion. As I understand Nossal, this is not the point he is attempting to make. Instead he is attempting to distinguish between sanctions and statecraft:

> Thus, all coercive economic policy instruments--embargoes, boycotts and indeed the disruption in the "normal" or "customary" levels of economic intercourse between states--are too often simply described as economic "sanctions".[49]

Thus, to Nossal, sanctions are punishments for wrong doing. This raises a touchy subject though: what is *wrong?*

> ...the perception that the target state has violated norms of moral behavior valued by the sender and thus deserves not only concrete penalties but also a public proclamation of the target's impiety.[50]

This answer asks yet another question: *What is moral behavior?* Before delving into a deep argument on international morality I shall side with the Realist perspective and assume that there

---

[49] Nossal, Kim Richard *International Sanctions as International Punishment* International Organization, v. 43. no. 2 Spring 1989, p. 305.

[50] Nossal, 1989, p. 306.

is no such thing. This may sound as though I am refuting Nossal's definition of economic sanctions, but I am not. I agree that sanctions are actions taken against a target because the sender feels wronged in some way. But *wronged* can mean threatened, disapproving, angry, hurt etc. Nations will always find reasons for their actions. For example, the US sanctions against the Dominican Republic in 1960-1962 were said to have been enacted because of the Dominican Republic's hostilities toward Venezuela. But another possible reason is the Trujillo resistance to US demands for change. Nations act out of a desire to survive and will create reasons for their actions.

Nossal's next point concentrates on the punishment aspect of sanctions. The Latin root of the word sanction is *Sanctio*, meaning punishment for some kind of violation.[51] But this punishment is not to be equated as sadism; punishment has purpose. Nossal finds three purposes of sanctions: first, as deterrence or prevention; second, as compulsion to end a behavior; and last, as retribution. The first two are encompassed by Baldwin, and as I shall show below, Hufbauer et al. These types are intuitive and are directly observable; the last type, retribution, is not.

Retribution plays an important role because it affects domestic politics, and the reputation of allies. First of all, forceful expression of national resolve and power always seems to have a *rally around the flag* effect in domestic politics. This has often been the purpose of many sanctions; e.g., COMECON.[52] Second, retributive sanctions relay a message to the allies of the sender nation that resolve is still present.[53] That is, the allied nations will perceive the sanctions as a show of strength towards offending nations. This in turn is interpreted as the nation having *strength* towards the alliance.

---

[51] Galtung also refers to sanctions as a punishment when depicting the resistance of a nation under sanctions as a prisoner.

[52] Not only did the US want to hurt the USSR, but show the public that their government was fighting the Communists actively.

[53] COMECON is also an example of this.

This type of sanction is not covered by Baldwin or Hufbauer et al, or for that matter any of the scholars reviewed. Part of this is due to the need to shift one's focus from sanctions directed at policy change, the hub of Baldwin's theory, to one that can encompass domestic politics and international reputation. The international reputation easily falls within the policy change rubric, but domestic politics does not. Although this point is extracted from Nossal's concept of retribution, it is unique and one of the more useful points brought out in his work.

Definition of economic sanctions

Using the ideas above, I shall attempt to formulate a definition now. This should act as an heuristic during the critique of Hufbauer et al, as well as the model testing. Economic sanctions are best thought of as a step on a *ladder of sanctions*, or what Baldwin calls *statecraft*. On the bottom of this ladder are diplomatic sanctions, the least destructive, and least austere. On the top are military sanctions, which include full scale war, the most severe and destructive. Between these two extremes lie economic sanctions. As a nation becomes involved in a conflict with another nation, they begin to climb this ladder, first diplomatic sanctions are placed into effect, next economic and finally military sanctions. This is intended to show the reader how sanctions will build on themselves. For example, nations do not usually engage in war without first imposing economic sanctions on their enemy if possible.

Now that economic sanctions have been placed into a context, let me define what I will consider to be a sanction. Any economic measure imposed by a nation(s) against another nation(s) aimed at harming them in some way, and provoked by some change in the target's behavior. This includes any change that may not truly provoke the sender, only give the nation a reason to impose sanctions. This definition allows for all sorts of conditions: threats, breech of international norms, simple power plays by the sender nation, etc. Nossal would not agree totally with this definition because it includes any change in the sender's policies that will harm the target, including the cessation of trade for reasons of economic competition. Although the purpose of this thesis is not to create a new theory, but test an existing one, one restriction should

be put on this definition. I do not propose that normal trade relations, including the trivial tit-for-tat game that occurs during two nations' trading, to be considered sanctions. This is not meant to define sanctions by their severity, but to exclude *normal adjustments* that nations undergo to stabilize their trade relations. Thus, the definition centers around the motive of the sender nation, not acuteness of the sanctions.

Using this definition would expand what are considered sanctions, and effectually give us a better understanding of the dynamics involved. As mentioned above, this is not followed up in this study because of the thrust to test Hufbauer et al's work. It does hold promise for future research though, which shall be discussed. I now examine, analyze and critique Hufbauer et al's work, after which I begin the process of modeling and testing the hypothesis.

Chapter III
Hufbauer, Schott and Elliott

As mentioned above in the introduction, the question Hufbauer, Schott and Elliott address in Economic Sanctions Reconsidered is not the question *if* economic sanctions work, but *when* they work. They attempt to determine what is it that make sanctions most likely to succeed, most like a policy *cookbook*, or a *recipe for a successful sanction*. As one can imagine, their work is very closely based on policy recommendations, as their nine commandments attest. Although they focus primarily on the U.S., their model, data and testing encompass the whole world. This focus is due partly to the overwhelming majority of sanctions in which the US was involved.[54]

The *cookbook*-like focus of Hufbauer et al makes their work not so much a theory that is being tested, but a moderately systematic exploration of sanctions. Strictly speaking this is not a theory, nor do I consider it one. But for reasons of testing their work, their *recipe for a successful sanction* I shall act as though it is one. This entails testing Hufbauer et al's results and deriving conclusions from their work. It, however, does not include referring to it as a theory.

Hufbauer et al's work is based on the following two basic questions which create their recipe for successful sanctions: what contributes to success and what costs are incurred. Were it possible to put their results into a sentence it would read: nations that are larger, patient, act swiftly and sternly and do not attempt too much, succeed the most. The assumptions that underlie these results are in the form of definitions. Hufbauer et al's first assumption regards the motives behind the study, efficiency. That is, they only want to find the most effective manner in which to impose sanctions successfully. This is a clear break from the Idealist who concerns herself with questions of morality and ethics. Hufbauer et al have no such agenda. The second assumption/definition is Hufbauer et al's definition of sanctions. They cite three possible grounds for imposing a sanction: "Demonstration of resolve...", "Deterrence..." and as a form of punishment

---

[54] Almost two thirds of all sanctions involved the U.S. as a sender.

that "...add[s] teeth to international diplomacy"[55]. Later they define sanctions as having five possible goals:

> Change target-country policies in a relatively modest way... Destabilize the target government... Disrupt a minor military adventure... Impair the military potential of the target country... Change target-country policies in a major way...[56]

There is a problem here: the goals and grounds for imposition are not fully connected. None of these policy goals fall specifically into the original three reasons for the use of sanctions, and the reader is left to interpret how this happens. This discrepancy is troublesome when attempting to pin down Hufbauer et al's definition of sanctions. The solution here is not to concentrate on the goals or grounds for sanctions, but to derive just what qualifies as sanctions for them. For Hufbauer et al sanctions would include any harmful economic measure implemented on the instigation of the target's policies and/or actions. This does include sanctions aimed primarily at alliance reinforcement:

> Indeed, the international community often expects such action from the United States, to demonstrate moral outrage and to reassure the alliance that America will stand by its international commitments.[57]

The definition does not include sanctions being used to bolster public opinion, something that makes Hufbauer et al's results suffer from its absence. Once again this thesis is unable to deal with this problem as a result of its limited scope, nonetheless it will be followed up in the future.

Hufbauer et al are very explicit in forming their model that tests the questions previously laid out. The level of analysis used constantly throughout their work is the nation state. Although there is some brief mention of domestic interaction with economic sanctions, it is not followed up, nor is it tested. As mentioned above this is a failure of their theory. This level of analysis is common to just about all the authors reviewed, including Galtung, who views the nation state as an organism, and to Doxey, who concentrates on international organizations but

---

[55] Hufbauer, Schott and Elliott, 1990, p. 11.

[56] Hufbauer, Schott and Elliott, 1990, p. 38.

[57] Hufbauer, Schott and Elliott, 1990, p. 11.

still sees the world as made up of national actors. I find only slight fault with this, and that is the ignorance of how domestic politics and economic sanctions interact. A two level game should be set up to more fully encompass this phenomenon, and enable the researcher to test the relationships.[58]

The model is broken into three categories: foreign policy goals, political variables and economic variables. These account for the specific types of policies initiated, the past relationships of the countries and the international setting, as well as the economic costs and relations that exist. The types of foreign policy goals are set out above, while the political and economic variables will be specified below in the description and definition of the quantitative model. Hufbauer et al's use of case studies as a means to derive their results is done in a systematic manner, and there are enough cases where the conclusions are generalizable.[59]

The testing done by Hufbauer et al has many faults, but before they are analyzed a short diatribe. Methods are important tools that we as social scientists use, but they are only a tool and not a substitute for substantive theory, which should always be our primary focus. This is not meant to discount the importance of using the correct method for the job, one should attempt to be as accurate as possible. However, if some reasonable amount of accuracy must be initially sacrificed for interesting theory, one that is difficult to measure, then it is better to go ahead and improve on it later. There are many faults with Hufbauer et al's methods but one must not loose sight of the substance they created, for that is the important part. Having said this I will now attack their methods, and later I will make an attempt to improve them through scientific testing.

There are three main points of contention I have with Hufbauer et al's methods. First is their measure of duration. They want to use whole years as a unit, so they cut off any months

---

[58]For a discussion of two-level games see: Putnam, Robert D. *Diplomacy and Domestic Politics: The Logic of Two-Level Games* International Organization, 1988, v. 42 no. 3, 427-460.

[59] Hufbauer et al imply that their compendium of cases includes all sanctions from 1914 to 1991. Following their definition this is probably the case, however, as mentioned above, definitions are difficult to agree on. My feeling is there are more than 115 cases, but only if one changes the definition to the one I propose.

left over or round up. Yet when they begin their analysis they talk about sanctions lasting 2.1 years. Does this mean they lasted 2 years, 36 days and 12 hours? Instead of complicating this problem they should have used months as an even unit. The reason they give is to avoid the problems with dating the beginning and termination of sanctions, but it is far more inaccurate to round off to whole years than to attempt using months. Although this may not effect the calculated results much, there is no way to tell. Their reason is poor and the problem should be corrected.

The second problem Hufbauer et al have is the success rating used is crude and leaves little room for variation. They use a four point scale to determine whether a policy was successful or not, and one to determine how much the sanctions contributed. These scales are created by examining expert opinions on each case. These two scales are then multiplied resulting in the measure for success. Hufbauer et al then set the minimum value for success at 9, moderate success and moderate contribution by the sanctions. By setting the cut off level at 9 however, they leave only four possible scenarios that equate to success: the sanctions must have had a modest or significant contribution completing policy goals either somewhat or totally. This does not allow for enough variation in the testing, making the results difficult to interpret. Also it seems atheoretical to simply decide to multiply two scores together without a reason. Because of this there is no way to evaluate whether or not the data is biased. This possible bias could be mitigated somewhat by adding variability in the success variable. That is, as more room was created on the scale of success different cases could be ordered in levels of their respective successes. Thus, 115 cases would not be rammed into only 9 possible outcomes.

The last critique is the most problematic, Hufbauer et al use their data as if they were interval, while much of the data are really ordinal. There is, however, a reasonably strong defense for this, though. The data that are specifically the problem are the measure of success. It falls

into integers ranging from 1 to 16.[60] These are continuous, and ordered only in the sense that higher values indicate higher levels of success. Thus, one could interpret a mean of 6.83 as a sanction that has had minor to moderate contribution to a result that is positive or almost so; that is, the mean sanction is only moderately successful. Although mathematically this is inaccurate because the measure cannot take on such a value, still intuitively it can be so interpreted. I am not advocating this kind of use in statistics on a regular basis, I am however offering it as an initial point at which to start. The problem of measures of success is their inherently inescapable subjective bias; that is, there is no possible way to measure the success of a sanctioning episode objectively. The only solution to this is to systematically define how sanctions will be measured. That way all of the sanctions rated will be done so equally, and treated not in an ad hoc matter, but in a methodical one. This is what Hufbauer et al have done, and although the measure needs improvement, it will have to wait.

Hufbauer et al's *recipe*, and the testing of it, are done in a systematic manner which allows for falsification and later testing, of which this thesis is proof. Given their faults, the study is a sound one and I would not expect to see much failure in it. However, as I show below there are some significant differences in the results I find and the ones they report. The rest of the thesis will be devoted to this cause: defining the model and variables, discussing the expected results, and then testing the model. So without further delay, let's jump right into the fun stuff.

---

[60] There are 9 different values that the measure can take on, this is caused by the multiplication used to create the measure. This will be discussed formally below.

Chapter IV
Quantitative Model

To test Hufbauer, Schott and Elliott's results, a specific model will be developed, following what were referred to as the *nine commandments* in the introduction. First, the variables are defined and described, second the model is explicated and last I write out the expected results.

List and definition of variables

There are 13 variables, not including lags or transformations, that will used to test Hufbauer et al's work. The dependant variable, SUCCESS, is one of the most problematic not only for the lack of variation as discussed above but for the manner in which it was created. A quick recap may help. Hufbauer et al used two four point scales, one for achievement of the objective and one for the contribution the sanctions made. These were determined by the expert opinions of several scholars in each case.[61] These two values were then multiplied, implying an interactive relationship. But in the process of doing this the number of possible values for a case to occupy is only 9. To rectify this problem I have recoded the variable, now RSUCCESS, to make it contiguous, the values are shown in Table 1:

SUCCESS	1	2	3	4	6	8	9	12	16
RSUCCESS	1	2	3	4	5	6	7	8	9

The variable is now contiguous. The only possible qualitative effect on the variable from this transformation is if the non-recoded values had some intuitive meaning. For example, if a 12 is *twice* as successful as 6 instead of the difference between 5 and 8.[62] There is no evidence to support this ether way, and Hufbauer et al make no mention of its significance. For these reasons I shall use the recoded variable.

---

[61] Hufbauer, Schott and Elliott, 1990, p. 41-42.

[62] I thank Scott Gates for pointing this out to me.

Of the 13 variables there are 5 dummy variables. The first is BLKNIGHT. This refers to the presence of a nation or nations who openly aid the target nation, in effect becoming the *black knight* to the sender country. This does not include covert aid to the target, instead "...we are concerned with overt economic or military aid to the target country in response to the imposition of sanctions."[63] The second dummy is COOP, international cooperation on the side of the sender nation. This is just the opposite as the black knight effect, although both can occur at the same time. Cooperation is considered to be either zero or *modest*: "...meaningful restraints... from some but not all the important trading partners of the target country" to *significant*: "the major trading partners make a major effort to limit trade, although leakages may still exist through neutral countries"[64]

The economic vitality and political stability of the target are accounted for by the DSTRES variable. A country is considered distressed when it has "..acute economic problems, exemplified by high unemployment and rampant inflation, coupled with political turmoil bordering on chaos"[65] The RELATE dummy refers to the prior relations between the sender and the target, specifically if the relations were friendly. That is, considered "...close friends and allies"[66] The last dummy variable, POLICIES, determines if the sender nation used any other policies in conjunction with the economic sanctions. This includes covert, quasi-military and full scale military sanctions.

The variables that remain fall into two groups, those that are characteristic of the nations involved and those that concern the consequences of each sanction. In the first group PERCENTM and PERCENTX are measures of the percent of pre-sanction imports coming from the sender

---

[63] Hufbauer, Schott and Elliott, 1990, p. 45.

[64] Hufbauer, Schott and Elliott, 1990, p. 44.

[65] Hufbauer, Schott and Elliott, 1990, p. 46.

[66] Hufbauer, Schott and Elliott, 1990, p. 47.

nation(s) and the exports being received by the senders, respectively. GNPRATIO is a measure of sender to target GNP, a relative measure of the nations' strength.[67]

The second group begins with TARCST, which is the actual cost to the target in current dollars (measured in millions). This does not include any political costs to the target, only economic ones. The methods used in determining this is simply determining the pre-sanction supply and the post-sanction implementation supply, and then determining the costs from the lost supply.[68] Similarly, GNPCST is the same figure only controlling for the target's GNP, thus cost as a percent of GNP.

The last two variables are LENGTH and COST, where LENGTH is simply the duration of the sanctions in years. COST is an analysis of gains or losses to the sender, as rated on a four point scale, four being a major loss and one being a net gain.

Description of model

Creating the model is a rather simple task because the variables and theory come from Hufbauer et al's work. In addition to Hufbauer et al's model, past successes (RSUCCESS) will be added along with lagged values of COST, GNPCST, TARCST and LENGTH. This will determine whether nations have a tendency to look back on past sanctions and react to them. That is, do past sanctions effect Nation B's decision to resist Nation A, or not. The initial unreduced model will be the following:

RSUCCESS = BLKNIGHT + COOP + DSTRES + POLICIES + RELATE + GNPRATIO + PERCENTM + PERCENTX + COST(AND LAGGED COST) + GNPCST(AND LAGGED GNPCST) + LENGTH(AND LAGGED LENGTH) + TARCST(AND LAGGED TARCST) + LAGGED RSUCCESS

There are eight variables that theoretically cannot be lagged: the dummies and GNPRATIO, PERCENTM and PERCENTX. These are situational factors, that is, they comprise

---

[67] All three of these measures are discussed briefly in Hufbauer, Schott and Elliott, 1990, p. 48.

[68] For a full discussion of this see Appendix A, Hufbauer, Schott and Elliott, 1990, pp. 120-122.

the environment in which the sanctions take place, past values should not effect them. For example, it is expected that Nation B will be concerned with the successes, costs and lengths of past sanctions, but not with the characteristics of the target and sender. Thus, these variables will not be lagged.

One important note must be made about the lagged variables. The cases are ordered by the time in which they occurred, not by each year. That is, some years no sanctions occurred and in others many did. The most sanctions imposed in a single year was in 1978 when 8 sanctions were imposed. The mean sanctions applied in a given year from 1914 to 1990 is slightly over 1.5, but as one can see this is meaningless, much as the average family with 2.4 children. Thus, the lags are event lags, past sanctions, whether that means in the same year, or several years in the past. The concept behind the lags is that the target country will look back to the last few sanctions, not the last few time periods, to estimate what consequences of the sanctions being presently imposed may be.

Expected results

I now lay down the results I expected to find when testing the model, this is based on the *Nine Commandments* from Hufbauer et al, and additional expectations on how the lags work. In order to do this I discuss what each variable was expected to do and then summarize these expectations.

Of the dummy variables Hufbauer et al expect that BLKNIGHT, DSTRES, POLICIES and RELATE all to be significant in estimating success. They find COOP to be insignificant. This insignificant result could be due to the black knight effect, which is expected to be strongly negative. The economic and political stability of the target should have a weakly positive effect on sanctions, that is, a distressed nation will be more likely to fold under sanctions. Non-economic policies should have a reasonably positive effect as should the relations between sender and target. These relate to the ideas of *choosing the right tools for the job* and *picking on your friends.*

In considering the rest of the variables all were expected to be significant. The greater the size difference between the two nations and their previous attachments, measured by GNPRATIO, PERCENTM and PERCENTX, respectively, should all have positive effects on success. The two variables, ▲TARCST and ▲GNPCST, essentially measure the same thing, cost to the target. These should positively effect success as well. COST is expected to be significant but on closer examination of their tables it seems that it is borderline.[69] The cost should have a negative effect on success, but I am dubious of its significance. The last variable Hufbauer et al use is LENGTH.[70] Unlike the other variables, the length of the sanctions has a negative effect on success, thus the quote: *"If It Were Done, When 'Tis Done, Then 'Twere Well It Were Done Quickly"*[71]

Thus, sanctions which hit hard and quick, and are directed against a nation which has close, friendly ties with the sender, and is isolated, are the most likely to succeed.

The additional variables that are added are the lagged values of COST, GNPCST, LENGTH, TARCST and RSUCCESS. I expect that nations look back on the results of past sanctions, and their factors. That is, Nation B, when deciding to resist sanctions from Nation A, will look back and see if past sanctions were successful, long lived and/or costly to either target or sender. GNPCST, TARCST and RSUCCESS should all positively effect success, with a diminishing effect. Lagged COST and LENGTH, unlike their present values, should also have a positive effect on success. This is due to the target nation seeing the resolution of past senders, that is they were willing to bear heavy costs and wait out the sanctions for a long time.

Now with the model specified, and the expected results laid out we can move on to the statistical testing.

---

[69] Hufbauer, Schott and Elliott, 1990, pp. 92-106.

[70] Due to restrictions in methodology and data the type of sanction and goal cannot be tested.

[71] Hufbauer, Schott and Elliott, 1990, p. 100.

Chapter V
Statistical results and problems encountered

I have taken an econometric approach for the data analysis as developed by Robert Engle, David Hendry and Jean-Francois Richard.[72] I have had to modify this time series approach somewhat. As mentioned above the *time* is not a function of years, months or for that matter any time, it is a function of sanctions. One could argue that this is an event count model, which it is in many ways.[73] But on the same grounds all data are event count, for anything that happens is an event. This point is more nit picking than helpful though, so let us move on.

The original model I began with contains 30 variables, including lags and a constant. Listed below are the variables and their respective signs, I shall refrain from listing their coefficients and t-scores until I begin the reductions. Each equation, that is all the print out, can be found in the Appendix A.

RSUCCESS = CONSTANT - BLKNIGHT - COOP + DSTRES - POLICIES + RELATE - COST - COST1 + COST2 + COST3 + GNPCST - GNPCST1 + GNPCST2 - GNPCST3 + GNPRATIO - LENGTH + LENGTH1 - LENGTH2 -LENGTH3 + LENGTH4 + PERCENTM + PERCENTX + TARCST - TARCST1 + TARCST2 - TARCST3 + RSUCCESS1 - RSUCCESS2 + RSUCCESS3 + RSUCCESS4

The reader will note that the dynamic specification is AD(1,1). I found at this point in time this specification was more appropriate than the Error Correction Model(ECM) or Partial Adjustment(PA) models due to the requirements for common factors.[74] I do intend to use the ECM in the future because of its theoretical attractions.

---

[72] Engle, Robert and David Hendry *Testing Super Exogeneity and Invariance in Regression Models* Applied Economics Discussion Paper no. 100, University of Oxford, 1990; and Engle, Robert, David Hendry and Jean-Francois Richard *Exogeneity* Econometrica, v. 51, 1983, pp. 277-304.

[73] The data will be modeled as an event count following the econometric model.

[74] For a full discussion of this see: Beck, Nathanial *Comparing Dynamic Specifications: The Case of Presidential Approval* Forth Coming: Political Analysis, March 1991.

In reducing the model I used 6 different equations.[75] I shall now list the reductions along with their coefficients, t-statistics and the new, that is post-reduced, residual sum of squares, model variance and Schwarz Criteria. The first reductions, shown in Table 2 were to remove GNPCST, and its three lags, GNPRATIO, LENGTH and RSUCCESS1.

Variable	β	t-stat
GNPCST	.0558771	.92841
GNPCST1	-.0358706	-.35541
GNPCST2	.0126209	.12142
GNPCST3	-.1150506	-1.20178
GNPRATIO	.0000189	.22310
LENGTH3	-.0199133	-.55236
RSUCCESS1	.0315563	.28559
RSS = 502.84	σ = 2.3904	SC = 2.49

The initial values, before the reduction were: RSS = 484.32, σ = 2.4452, sc = 2.75, R^2 = .42056, $F_{(29, 81)}$ = 2.03, DW = 2.121. This first round of reductions is very surprising because both Hufbauer, Schott and Elliott's ideas of relative size and cost to the target show themselves as unimportant, as well as my idea of past values of success holding some importance. The reason that GNPRATIO was found to be insignificant is probably due to its large range and not the fact that relative size matters when applying sanctions. For all observations the minimum value for GNPRATIO is .1, while the maximum is 32900, with a standard deviation of 3103. If you restrict the values to be under 2500, the standard deviation falls to 384 while only loosing five observations. After restricting the variable to under 1000 the standard deviation becomes 224, while loosing only nine observations. When the regression analysis was re-run with a limit of 1006 (there was only one observation that close to the cut off) GNPRATIO was still insignificant.

---

[75] In the Appendix there are more than 6 reductions, for purposes of reporting the results however I only listed 6 to avoid being tedious.

Thus, I must conclude that the variable is not important in its present state. However statistics should not be taken as the word of God, so considering this and the fact that relative size seems intuitively important, I suggest that in the future it should be remeasured to see if it is important after all.

The problems with the ratio of GNP's is a difficult quandary. The use of the measure is not unusual. Organski and Kugler used total national output as a measure for national power in The War Ledger, actually finding little difference between the Singer-Bremer-Stuckey model which accounts for many aspects of a nation's power and GNP.[76] Although this was used as a measure for military power, it should hold for economic power as well. Thus, a ratio between the sender and target should be a good measure. The point here is that it is not the measure, but the great variation in national sizes. Two possible solutions come to mind. First, instead of using a ratio, the straight GNP figures could be used as variables. Unfortunately this gives no idea of relative size since the variables are separated. The second possibility is to reverse the direction the ratio is calculated in, that is instead of it being sender/target, it could be calculated as a relative *weakness* variable: target/sender. This would crush the variation down, such that: $10 \geq \delta \geq .000000303951$, where δ is the new ratio. Although this is a little hocus pocus, GNP is a good measure of power, and reversing the ratio seems like it solve the problem. This shall not be done here but is reserved for, and is currently being calculated, other work.

GNPCST was also reduced, but it does not suffer from the same problem as GNPRATIO. This may lend us the possibility that the decision maker is not told the costs of the sanctions relative to the nation's GNP but as a total cost, TARCST. This should not be the case however, as one would expect to find a decision maker to generally know what her nation's GNP is, and as such would take it in to account. I can only hypothesize that once again the data is not

[76] Organski, A.F.K. and Jacek Kugler The War Ledger, 1980, Chicago: University of Chicago Press, pp. 33-38.

accurate in measuring the concept. Cost to the target, TARCST remains significant throughout the reductions.

LENGTH 3 also was dropped, this is not counter to the expectations, as it seems the decision makers do not look back to the third sanction. As mentioned above they are expected to have some effect, but at which point is unknown. This is also true with RSUCCESS 1. Until all the lags have been deleted I shall not make any conclusions about their effectiveness, or lack thereof.

The tests for proper reductions were satisfied, the Schwarz Criteria went down, as did the σ, while the residual sum of squares went up. Thus the first round of reductions was successful.

The second round of reductions eliminated the following variables in Table 3:

Variable	β	t-stat
POLICIES	-.5641345	-.90012
RELATE	.1554511	.27701
COST	-.2886574	-.77002
RSUCCESS 2	-.1237286	-1.30042
RSUCCESS 3	.0101487	.10941
RSUCCESS 4	-.0010201	-.01123
RSS = 525684	σ = 2.3648	SC = 2.28

This is one of the most surprising set of reductions as four main expectations fall out. First, it seems that added policies are do not significantly change the chances for success of sanctions. I can think of no counter argument to this result so I must conclude that policies do not effect the success of sanctions. This is also true of the prior relations between the sender and target. Both of these results are a complete surprise and bear witness for the need for further research and especially theoretical work on sanctions.

The current cost to the sender country was dropped, but this is less of a surprise. It seems that countries often will maintain a course of action once they commit even if it is costly
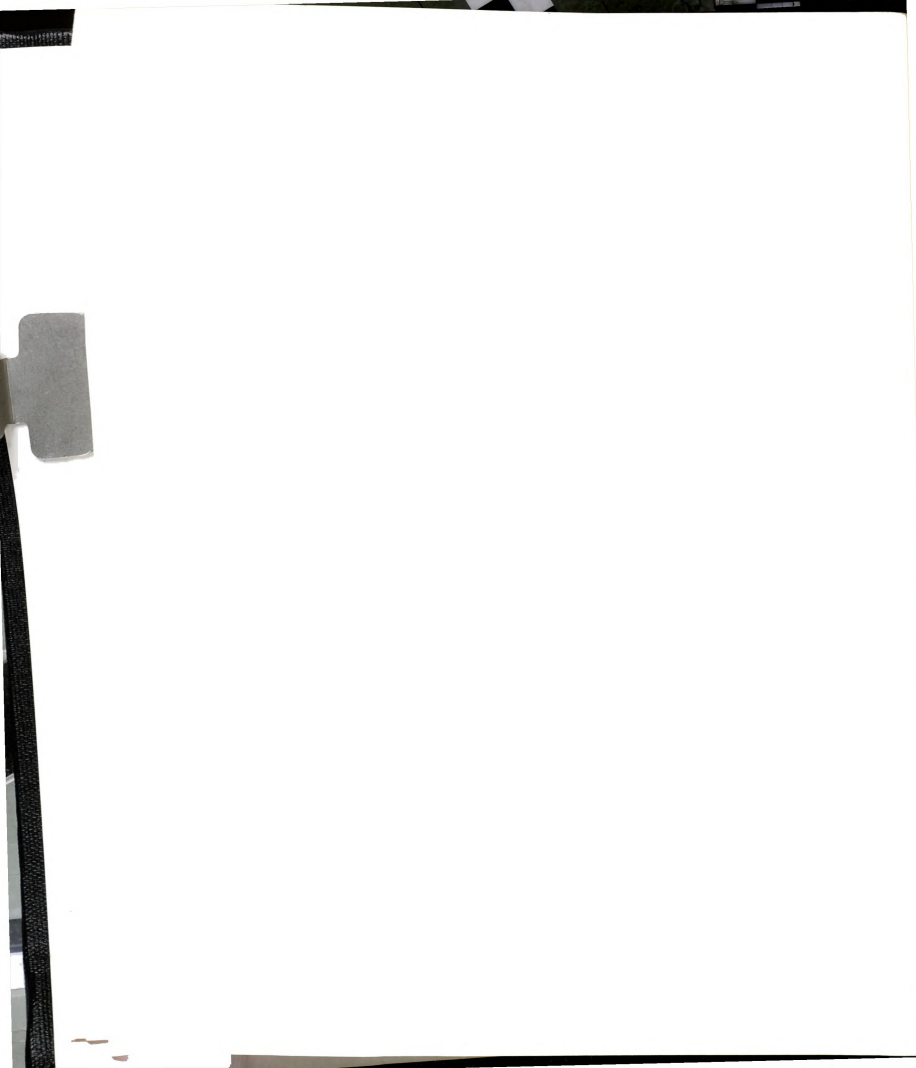
to them. Also, the political costs of terminating the sanctions may outweigh the fiscal costs of maintaining them. Thus, the cost they are bearing has no influence on their decision to cease the sanctions.

Lastly, all lagged values of RSUCCESS proved to be unimportant to the decision maker. This seems mainly the result of the decision maker's lack of interest in the outcomes of a previous sanctions because the past target could be totally different from the present decision maker. What is of interest is the past lengths the sender went to punish the target. This shall be shown in the final model.

The third group of reductions are shown below in Table 4:

Variable	β	t-stat
COST 3	.0939018	.29828
LENGTH	-.0318588	-1.05230
LENGTH 1	.0500019	1.72475
PERCENTX	.0123832	.63382
TARCST 2	.0002646	.71805
RSS = 548.34	σ = 2.3534	SC = 2.11

This round proved to be less surprising. As mentioned above I will ignore the reduction of any lagged variables until there are none left. LENGTH has been deleted showing that there is little effect on the amount of time that sanctions are imposed. This could be caused by the variation in the length, where the maximum is 44 years, and the mean is only 6.052. When the value was restricted to less than or equal to 10 years, the mean became 3.152 and the skewness dropped from 2.845 to 1.089, while only loosing 16 observations. Although this may be the cause, one cannot delete every outlier to make the goodness of fit better, all the while it is worth noting.

The other non-lagged variable that was removed was PERCENTX. Although Hufbauer et al predicted this to remain important they also combined both the percentages of imports and

exports in their analysis.[77] This result is not that surprising so long as the percent of imports remains significant, which it does. The conclusion to be drawn here is that the percent of exported goods to the sender is not as important a tie as imported goods are. This is possibly because export markets are easier to replace than finding importers.

The fourth round of reductions leaves us with only eight variables in Table 4:

Variable	β	t-stat
COST 1	-.3802970	-1.27243
LENGTH 2	-.0390831	-1.41936
TARCST 1	-.005914	-1.65252
TARCST 3	-.0005596	-1.534485
RSS = 595.45	σ = 2.4044	SC = 2.02

All the lags of TARCST are now gone, obviously the decision maker does not look back on what past target's lost. This could be a result of the decision maker seeing his costs as being unique, unlike the extent to which the sender will go, as that seems to weigh on his decision.

For the first time there is a sign that we may have reduced to far, the variance increased. To check this an F-test was run comparing all past models with this one, at no point did the P-value reach .05, the highest it attained was .0831, showing no threat to the reductions. Backing this up is the lower value of the Schwarz Criteria and the increase in the residual sum of squares.

The last reduction made was to remove COOP, whose β = -.7545279, and the t-stat = -1.33018. As mentioned when discussing the expected results, international cooperation was supposed to drop out. Although it persisted to the last reduction, it did follow the expectations. Still, this deserves further research, perhaps, if it did prove to be a significant factor. The saying:

---

[77] This was called "Average trade linkage (percentage of total trade)", Hufbauer, Schott and Elliott, p. 99. I find it more accurate and informative to separate imports and exports.

"More Is Not Necessarily Merrier"[78] should be amended to say *Too Many Cooks Spoil the Soup.*

Needless to say this possibility should be researched further.

The final model that is left after the 30 variables is reported below in Table 5:

Variable	β	t-stat
Constant	2.2579175	3.24880
BLKNIGHT	-1.6686837	-2.99202
DSTRES	1.4482112	2.53425
COST 2	.7906051	2.64900
LENGTH 4	.0650850	2.43503
PERCENTM	.0331413	3.18519
TARCST	.0008640	2.32053
RSS = 605.68	σ = 2.4132	SC = 1.99

As one can see from the table below reporting the results of the diagnostic tests, the equation is significant, but the goodness of fit is not that impressive, according to the R^2. There is certainly some room for improvement. For tests of first order autocorrelation I used the Durbin-Watson statistic, and then preceded to test up to the seventh order, AR 1 - 7, the results of which are distributed as an F-test. I confidently reject the possibility that there is any error autocorrelation present in the data. Next was a test for normality, checking for small sample inference, which was not significant. I consider my sample size large, but according to Peter Schmidt, all researchers do, thus I tested for normality.[79] There was a slight problem with excess kurtosis, which is -.796385, but the curve is normal with almost no skew to it whatsoever. At this point I tested for auto regressive conditional heteroskedasticity, or ARCH. This is best shown in Figure 5.1,[80] notice there is no regular grouping of residuals, that is, the large residuals do not cluster

---

[78] Hufbauer, Schott and Elliott, 1990, p. 95.

[79] Stated in an Econometrics class, Michigan State University, Spring, 1992.

[80] FIGURES 5.1 through 5.5 are found in Appendix A.

together nor do the small residuals. The test was negative as well. Lastly I checked for mis-specification using the RESET tests, the general test for functional form and of course the Schwarz Criterion throughout the reductions. These tests are really aimed at discovering an omitted variable problem, which was not found. The results are shown in Table 6:

R^2	.2753667
F (6, 104)	6.59
Durbin-Watson	2.164
AR 1-7(7, 97)	.44
Normality-Chi^2(2)	2.790
Func. Form(25, 77)	1.3536
ARCH(7, 90)	1.35
RESET(1, 103)	.804
RESET(2, 102)	.464
RESET(3, 101)	.34

The next step is to use Recursive Least Squares(RLS) to estimate the model and subsequently test for parameter consistency. RLS estimates its parameters incrementally, and as such tests their significance one by one. This allows the parameters to be tested for constancy. These tests are checking to see if the model is *weakly* exogenous, which allows us to make valid inferences about the ß's. This is best defined as: "A parameter, ß is constant if it holds the same value over the sample period."[81] These tests are checked visually, that is they are graphs of residual variation. The first, Figure 5.5 shows the residuals plotted over time, between 2σ. Note the residuals do not break this line and as such remain constant over time. Also the residuals show a stable pattern, just as they do in Figure 5.1, lending more evidence to their consistency. Figure 5.2, depicts a One-Step Chow test for the residuals. Although it breaks the

---

[81] Granato, Jim *An Agenda for Econometric Model Building* Political Analysis, 1992, vol.3, Ann Arbor: The University of Michigan Press, p. 129.

critical value of .05 three times, this is not enough to scrap the model by any means, but something to watch for in the next two tests. Figure 5.3 represents a decreasing forecast horizon, which tests the whole model against a restricted model, which is increased step by step. Each step is then tested with a Chow test. As you can see there is no point at which the residuals break the .05 critical value line. The last graph, Figure 5.4, is an increasing forecast horizon, which does just the opposite of the decreasing horizon. And, just like Figure 5.3 the critical value is not broken. This lends support to the conclusion that the model does indeed have stable parameters, and thus is weakly exogenous.

Chapter VI
Policy implications and conclusions

The first thing to note is: *This study is far from over.* Not only do the results and problems with the analysis call for more testing, but this subject is in need of more study. Having said this I will now proceed to discuss the main findings and recap the conclusions that should be drawn from them.

The first thing to note is the effect, or more accurately the problems caused by the ordinal data. Although the results were not made invalid because of it, but I would bet there would be a better fit if the data were interval. The last point I will make concerning methodology concerns Hufbauer et al's predictions. The testing they did was not very rigorous, and their statistics are seriously flawed. As such the separate analysis of each variable, and atheoretical combination of some[82], did not properly test the interaction of the exogenous variables. This sounds like a plug for the use of more rigorous statistics, which it is. By using regression one can better understand the variables together, something that Hufbauer et al failed to do and as such their analysis was faulty. The real proof of this is the dummy variables that fell out as well as the percentage of exports going to the sender nation. Not only do faulty conclusions come from their analysis but just as importantly there is no reason to do further analysis if those conclusions are accepted. It seems better to continue questioning, than to stop at what could be invalid answers.[83]

The last part of this discussion is an attempt to answer the question: *So What!?* If you observe all the sanctions imposed in the data set, it seems there is no consideration on the part of the sender for their possible success, and as Mr. Spock would say *"That is illogical Doctor"*. Or is it. This is not a study of why sanctions are imposed, but curiously nations do not seem to concern themselves with the possible outcome of their actions, or they may not know what the

---

[82] This refers to the combination of imports and exports into total trade.

[83] Hufbauer, Schott and Elliott did use regression analysis in the First Edition of Economic Sanctions Reconsidered, however it was poorly constructed and estimated. They dropped is from the Second Edition saying it did not add any information to their results.

best manner to impose sanctions. I believe that the reasons for imposing sanctions are not connected to success the way Hufbauer et al define it. This should change however when the specific goals are redefined and then tested.

The worth of this type of study, and this one in particular, is still in question. The answer is rather simple: by better understanding what makes sanctions work, more efficient policies can be followed in order to attain success. This is the first step towards a general understanding of sanctions and their effects, which should lower the wasted attempts and great losses to both sender and target.

As a final conclusion I will lay down my version of Hufbauer et al's "Commandments": First, isolate the target as best possible, and give no other nation a reason to be a *black knight*. If there is such a nation, the sender should reconsider. Second, pick on the weak and helpless; not only are they the most vulnerable, but in all the cases where the target was distressed, only 16.7% of the time did a black knight appear. Third, the sender should sanction those whom she imports a good deal from. Fourth, impose as much cost on the target as possible. Last, *always* show resolve, and hope that others did in the past as well. This relates to the significance of LENGTH 4 and COST 2. It follows that if the target decision maker looks back on past values of those variables, that the sender's past record would also be significant.[84]

Economic sanctions are a useful tool to nation-states, and to international organizations. They reduce the cost of human lives in many cases by weakening an adversary, or avoided military confrontation all together. Their uses are far more fungible than military sanctions, and have more bite than diplomatic sanctions. The study of them however is sparse to date, a gap that should be filled through rigorous theories and testing.

---

[84]This is untested, and as such should be taken with a grain of salt.

APPENDIX A

APPENDIX A

Output for c:\thesis\append.OUT
  Begun at
11: 2:50 on 31st July   1992

Data came from the Input Files: c:\thesis\ecnscn.INF   and c:\thesis\ecnscn.BIN

Model OUTPUT from P C - G I V E

  The Sample is   5 to   115 less   0 Forecasts

M E A N S   of   V A R I A B L E S

RSUCCESS	RSUCCES1	RSUCCES2	RSUCCES3	RSUCCES4	CONSTANT	BLKNIGHT
4.9640	4.9820	4.9820	5.0090	5.0180	1.0000	.2252
COOP	DSTRES	POLICIES	RELATE	COST	COST 1	COST 2
.2793	.2072	.3333	.3423	1.8559	1.8378	1.8559
COST 3	GNPCST	GNPCST 1	GNPCST 2	GNPCST 3	GNPRATIO	LENGTH
1.8559	1.7982	1.3658	1.4018	1.4081	593.6694	6.1982
LENGTH 1	LENGTH 2	LENGTH 3	LENGTH 4	PERCENTM	PERCENTX	TARCST
6.1982	6.2072	6.2072	6.2342	22.7613	22.8784	178.7622
TARCST 1	TARCST 2	TARCST 3				
178.5676	181.7658	179.0721				

STANDARD DEVIATIONS OF VARIABLES

RSUCCESS	RSUCCES1	RSUCCES2	RSUCCES3	RSUCCES4	CONSTANT	BLKNIGHT
2.7566	2.7765	2.7765	2.7518	2.7600	.0000	.4196
COOP	DSTRES	POLICIES	RELATE	COST	COST 1	COST 2
.4507	.4071	.4735	.4766	.8073	.7809	.7845
COST 3	GNPCST	GNPCST 1	GNPCST 2	GNPCST 3	GNPRATIO	LENGTH
.7845	5.2085	2.7502	2.7596	2.7574	3157.3927	8.8254
LENGTH 1	LENGTH 2	LENGTH 3	LENGTH 4	PERCENTM	PERCENTX	TARCST
8.8254	8.8206	8.8206	8.8090	22.6959	24.8136	634.4464
TARCST 1	TARCST 2	TARCST 3				
634.4983	634.9474	634.9813				

D U R B I N - W A T S O N   TESTS

RSUCCESS	RSUCCES1	RSUCCES2	RSUCCES3	RSUCCES4	CONSTANT	BLKNIGHT
2.0913	2.0190	2.0944	2.0997	2.0956	.0000	1.7553
COOP	DSTRES	POLICIES	RELATE	COST	COST 1	COST 2
1.9694	1.9743	1.6622	1.9207	1.9528	1.9529	1.9352
COST 3	GNPCST	GNPCST 1	GNPCST 2	GNPCST 3	GNPRATIO	LENGTH
1.9500	1.3582	2.1139	2.1195	2.1117	2.0216	1.5360
LENGTH 1	LENGTH 2	LENGTH 3	LENGTH 4	PERCENTM	PERCENTX	TARCST
1.5360	1.5378	1.5379	1.5429	1.7530	1.7852	1.9728
TARCST 1	TARCST 2	TARCST 3				
1.9724	1.9729	1.9759				

CORRELATION MATRIX

	RSUCCESS	RSUCCES1	RSUCCES2	RSUCCES3	RSUCCES4	CONSTANT	BLKNIGHT	COOP
RSUCCESS	1.0000							
RSUCCES1	-.0381	1.0000						
RSUCCES2	-.1391	-.0472	1.0000					
RSUCCES3	.0564	-.1344	-.0619	1.0000				
RSUCCES4	-.0847	.0653	-.1388	-.0563	1.0000			
CONSTANT	.0000	.0000	.0000	.0000	.0000	1.0000		
BLKNIGHT	-.2287	.0347	-.1369	.0770	.1534	.0000	1.0000	
COOP	-.1016	.0767	-.1340	-.1340	.1640	.0000	.3374	1.0000
DSTRES	.2497	.1240	-.1253	-.0098	-.1085	.0000	-.0628	-.0210
POLICIES	-.0186	.0530	-.1268	-.1419	.0023	.0000	.3050	.2414
RELATE	.0717	.0116	.0459	-.0370	-.0462	.0000	.0201	.0164
COST	-.1372	.1083	-.1066	-.0608	.0542	.0000	.0967	.3615
COST 1	-.1294	-.1565	.1454	-.0755	-.0788	.0000	.1680	.0007
COST 2	.1826	-.1014	-.1890	.1269	-.0534	.0000	.0719	.0635
COST 3	-.0781	.1824	-.1014	-.1889	.1272	.0000	.2652	.2692

```
GNPCST       .1595   -.1050   -.0861    .0754   -.0233    .0000    .0093    .1431
GNPCST 1    -.1016    .1803    .0286    .0601    .0263    .0000   -.1232   -.1477
GNPCST 2     .1128   -.0845    .1608    .0194    .0724    .0000   -.1636   -.0362
GNPCST 3    -.0714    .1124   -.0879    .1568    .0203    .0000    .0102    .0026
GNPRATIO     .0519   -.0115   -.1305   -.1582    .1332    .0000   -.0319    .1233
LENGTH      -.1428    .0124   -.1215    .0246    .1189    .0000    .3880    .2077
LENGTH 1    -.0064   -.1457    .0124   -.1285    .0226    .0000    .0787   -.0140
LENGTH 2    -.0532   -.0088   -.1472    .0063   -.1290    .0000   -.0569   -.2114
LENGTH 3    -.1216   -.0566   -.0088   -.1544    .0043    .0000   -.0373   -.1153
LENGTH 4     .1505   -.1203   -.0612   -.0158   -.1527    .0000   -.0070   -.0670
PERCENTM     .2531    .2023   -.0023   -.0143    .0069    .0000   -.0194    .1110
PERCENTX     .2281    .0964   -.0082    .0041   -.0066    .0000    .0584    .0883
TARCST       .1127    .0746   -.1599    .0154    .0360    .0000    .1475    .2874
TARCST 1    -.1351    .1098    .0751   -.1637    .0142    .0000    .0508   -.0862
TARCST 2     .1205   -.1276    .1025    .0724   -.1580    .0000   -.0894    .0091
TARCST 3    -.1669    .1149   -.1214    .1071    .0683    .0000    .0988   -.0506
             DSTRES  POLICIES RELATE   COST    COST  1  COST  2 COST  3 GNPCST
DSTRES      1.0000
POLICIES     .0629   1.0000
RELATE       .0528    .1343   1.0000
COST        -.2955    .3646   -.0123   1.0000
COST    1   -.0935   -.0738    .0528   -.0086   1.0000
COST    2   -.0764    .0571   -.0613    .1535    .0209   1.0000
COST    3    .0374    .2039   -.1586    .1679    .1544    .0250   1.0000
GNPCST       .0405    .3128    .1068    .3002   -.0933   -.0222    .0217   1.0000
GNPCST 1    -.0577   -.1070   -.0028   -.0477    .1637   -.0179    .0129   -.0686
GNPCST 2     .0603    .0719    .1695    .0156   -.0357    .1710   -.0154    .0311
GNPCST 3     .0932   -.0390   -.1633   -.0783    .0276   -.0432    .1716    .0135
GNPRATIO     .2795    .1559   -.0647   -.0299   -.1065    .0084    .0228    .0019
LENGTH      -.1254    .1385   -.1913    .1457   -.0019    .0593    .1722   -.0130
LENGTH 1    -.1279    .0645    .1501   -.0419    .1643   -.0155    .0593    .0785
LENGTH 2    -.1133    .0617    .1603   -.0966   -.0294    .1515   -.0154    .0666
LENGTH 3    -.1057    .1117   -.0905    .0974   -.0861   -.0429    .1515   -.0875
LENGTH 4     .0776    .1467   -.0149   -.1665    .1153   -.0951   -.0424   -.0895
PERCENTM     .0369    .2204    .3316    .1157   -.0937    .1035    .0160    .4728
PERCENTX     .0079    .2374    .3068    .1471   -.0383    .1242    .0096    .4139
TARCST       .0546    .0635   -.0057    .0424    .0650   -.0820   -.0078    .0053
TARCST 1    -.0259   -.0779    .1040   -.1418    .0495    .0585   -.0820   -.0088
TARCST 2     .1329   -.0372   -.0616   -.0876   -.1422    .0535    .0594    .0309
TARCST 3     .0542   -.0620    .0807   -.0989   -.0966   -.1427    .0527   -.0144
             GNPCST 1 GNPCST 2 GNPCST 3 GNPRATIO LENGTH   LENGTH 1 LENGTH 2 LENGTH 3
GNPCST 1    1.0000
GNPCST 2    -.0633   1.0000
GNPCST 3     .1327   -.0671   1.0000
GNPRATIO    -.0454   -.0581   -.0593   1.0000
LENGTH      -.0788   -.1598    .0683   -.0582   1.0000
LENGTH 1     .0688   -.0863   -.1613   -.0314    .2320   1.0000
LENGTH 2     .2417    .0619   -.0880   -.1625   -.1625    .2315   1.0000
LENGTH 3     .2198    .2331    .0606   -.0470   -.1632   -.1625    .2310   1.0000
LENGTH 4    -.0737    .2145    .2316   -.0170    .0491   -.1652   -.1649    .2295
PERCENTM    -.0248   -.0026   -.0614   -.0754   -.0409   -.0170    .1889   -.2156
PERCENTX    -.0386   -.0129   -.0596   -.0567   -.0227   -.0936    .0850   -.2208
TARCST       .0064   -.0147   -.0346   -.0456   -.0284    .0309   -.0554   -.0405
TARCST 1     .0495    .0029   -.0152   -.0204    .0228   -.0282    .0308   -.0552
TARCST 2     .0028    .0525    .0014   -.0299    .0403    .0198   -.0308    .0278
TARCST 3     .0256    .0015    .0540   -.0284   -.0141    .0428    .0221   -.0283
             LENGTH 4 PERCENTM PERCENTX TARCST   TARCST 1 TARCST 2 TARCST 3
LENGTH 4    1.0000
PERCENTM    -.1607   1.0000
PERCENTX    -.1266    .8705   1.0000
TARCST      -.0536   -.1127   -.1068   1.0000
TARCST 1    -.0412   -.0138    .0033    .0137   1.0000
TARCST 2    -.0569    .0346   -.0251   -.0169    .0123   1.0000
TARCST 3     .0296   -.0578   -.0369   -.0225   -.0158    .0116   1.0000
```

EQ(1) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts

```
   VARIABLE     COEFFICIENT    STD ERROR     H.C.S.E.     t-VALUE   PARTIAL r²
RSUCCES1         .0315563       .11049       .11180        .28559     .0010
RSUCCES2        -.1207291       .10306       .09496      -1.17147     .0167
RSUCCES3         .0143481       .10291       .10395        .13942     .0002
RSUCCES4         .0107587       .09870       .10441        .10900     .0001
CONSTANT        4.5271282      1.90041      1.70365       2.38219     .0655
BLKNIGHT        -.9030361       .76203       .75979      -1.18504     .0170
COOP           -1.0657853       .68076       .68213      -1.56558     .0294
```

DSTRES	.8788174	.71292	.78315	1.23270	.0184
POLICIES	-.7117061	.66124	.64922	-1.07632	.0141
RELATE	.1542180	.59711	.58756	.25827	.0008
COST	-.3654394	.41687	.41584	-.87662	.0094
COST 1	-.4721548	.36948	.34874	-1.27789	.0198
COST 2	.7942759	.35019	.32225	2.26812	.0597
COST 3	.2915646	.36688	.32748	.79472	.0077
GNPCST	.0558771	.06019	.05540	.92841	.0105
GNPCST 1	-.0358706	.10093	.09065	-.35541	.0016
GNPCST 2	.0126209	.10394	.08800	.12142	.0002
GNPCST 3	-.1150506	.09573	.07429	-1.20178	.0175
GNPRATIO	.0000189	.00008	.00004	.22310	.0006
LENGTH	-.0311800	.03347	.02946	-.93158	.0106
LENGTH 1	.0396715	.03355	.03704	1.18237	.0170
LENGTH 2	-.0479502	.03521	.03844	-1.36173	.0224
LENGTH 3	-.0199133	.03605	.03212	-.55236	.0038
LENGTH 4	.0841870	.03491	.03550	2.41184	.0670
PERCENTM	.0174733	.02577	.02427	.67813	.0056
PERCENTX	.0149661	.02121	.02065	.70549	.0061
TARCST	.0009433	.00042	.00032	2.25577	.0591
TARCST 1	-.0006301	.00041	.00027	-1.55032	.0288
TARCST 2	.0003399	.00041	.00037	.83294	.0085
TARCST 3	-.0007998	.00040	.00024	-2.00842	.0474

R^2 = .4205625 σ = 2.4452681 F(29, 81) = 2.03 [.0070] DW = 2.121
RSS = 484.3262209063 for 30 Variables and 111 Observations
Information Criteria: SC = 2.75; HQ = 2.31; FPE = 7.60
R^2 Relative to DIFFERENCE+SEASONALS = .72292

SEASONAL MEANS of DIFFERENCES are
-.01818

Solved STATIC LONG RUN Equation

RSUCCESS = 4.255 -.849 BLKNIGHT -1.002 COOP
S.E. (1.27316) (.77727) (.65246)
+ .826 DSTRES -.669 POLICIES+ .145 RELATE .233 COST
(.71233) (.63395) (.56406) (.61135)
-.077 GNPCST + .000018 GNPRATIO+ .023 LENGTH .016 PERCENTM
(.18047) (.00008) (.07056) (.02351)
+ .014 PERCENTX -.000138 TARCST
(.02076) (.00075)

WALD Test Chi²(13) = 520.186

ANALYSIS of LAG STRUCTURE

Var \	0	1	2	3	4	5	6	7	8	Σ
RSUCCES	-1.000	.032	-.121	.014	.011	0.	0.	0.	0.	-1.064
S.E.	0.	.110	.103	.103	.099	0.	0.	0.	0.	.231
CONSTAN	4.527	0.	0.	0.	0.	0.	0.	0.	0.	4.527
S.E.	1.900	0.	0.	0.	0.	0.	0.	0.	0.	1.900
BLKNIGH	-.903	0.	0.	0.	0.	0.	0.	0.	0.	-.903
S.E.	.762	0.	0.	0.	0.	0.	0.	0.	0.	.762
COOP	-1.066	0.	0.	0.	0.	0.	0.	0.	0.	-1.066
S.E.	.681	0.	0.	0.	0.	0.	0.	0.	0.	.681
DSTRES	.879	0.	0.	0.	0.	0.	0.	0.	0.	.879
S.E.	.713	0.	0.	0.	0.	0.	0.	0.	0.	.713
POLICIE	-.712	0.	0.	0.	0.	0.	0.	0.	0.	-.712
S.E.	.661	0.	0.	0.	0.	0.	0.	0.	0.	.661
RELATE	.154	0.	0.	0.	0.	0.	0.	0.	0.	.154
S.E.	.597	0.	0.	0.	0.	0.	0.	0.	0.	.597
COST	-.365	-.472	.794	.292	0.	0.	0.	0.	0.	.248
S.E.	.417	.369	.350	.367	0.	0.	0.	0.	0.	.640
GNPCST	.056	-.036	.013	-.115	0.	0.	0.	0.	0.	-.082
S.E.	.060	.101	.104	.096	0.	0.	0.	0.	0.	.185
GNPRATI	.00002	0.	0.	0.	0.	0.	0.	0.	0.	.00002
S.E.	.00008	0.	0.	0.	0.	0.	0.	0.	0.	.00008
LENGTH	-.031	.040	-.048	-.020	.084	0.	0.	0.	0.	.025
S.E.	.033	.034	.035	.036	.035	0.	0.	0.	0.	.073
PERCENT	.017	0.	0.	0.	0.	0.	0.	0.	0.	.017
S.E.	.026	0.	0.	0.	0.	0.	0.	0.	0.	.026
PERCENT	.015	0.	0.	0.	0.	0.	0.	0.	0.	.015
S.E.	.021	0.	0.	0.	0.	0.	0.	0.	0.	.021
TARCST	.00094	-.00063	.00034	-.00080	0.	0.	0.	0.	0.	-.00015
S.E.	.00042	.00041	.00041	.00040	0.	0.	0.	0.	0.	.00079

Tests on the Significance of each Variable

Variable	F[NUM,DENOM] = Value	Probability	Unit Root t-test

RSUCCESS	F[4, 81]	.397	.810	-4.602
CONSTANT	F[1, 81]	5.675	.020	2.382
BLKNIGHT	F[1, 81]	1.404	.239	-1.185
COOP	F[1, 81]	2.451	.121	-1.566
DSTRES	F[1, 81]	1.520	.221	1.233
POLICIES	F[1, 81]	1.158	.285	-1.076
RELATE	F[1, 81]	.067	.797	.258
COST	F[4, 81]	1.858	.126	.388
GNPCST	F[4, 81]	.609	.657	-.445
GNPRATIO	F[1, 81]	.050	.824	.223
LENGTH	F[5, 81]	2.097	.074	.341
PERCENTM	F[1, 81]	.460	.500	.678
PERCENTX	F[1, 81]	.498	.483	.705
TARCST	F[4, 81]	3.080	.021	-.185

Tests on the Significance of each LAG

LAG	F[NUM,DENOM] =	Value	Probability
4	F[2, 81]	3.035	.054
3	F[4, 81]	1.692	.160
2	F[4, 81]	1.411	.238
1	F[4, 81]	.832	.509

Testing for Serial Correlation from Lags 1 to 2

$CHI^2(2) =$ 4.608 and F-Form(2, 79) = 1.71 [.1873]

Error Autocorrelation Coefficients:

-.2185   .2935

ARCH TEST

Residuals Scaled by   .2445D+01

	CNST	1 LAG
COEFF.	.6595	.0924
S.E.'s	.1275	.1121

RSS = .82699D+02 σ = 1.02314
$CHI^2(1)=$ .938 with F(1, 79) = .68 [.4123]
CHI-SQUARED Test for NORMALITY :$CHI^2(2) =$ 1.799

TEST for HETEROSCEDASTIC ERRORS 111*R^2 = 26.3303 with 34 Variables

F(33, 57) = .5371 [.9715]

RESET F-TEST for adding Yhat²
F(1, 80) = 1.616 [.2074]

Testing for Serial Correlation from Lags 1 to 7

$CHI^2(7) =$ 7.414 and F-Form(7, 74) = .76 [.6252]

Error Autocorrelation Coefficients:

-.2071   .2359   -.1793   .0815   .0712   .1134   .0145

ARCH TEST

Residuals Scaled by   .2445D+01

	CNST	1 LAG	2 LAG	3 LAG	4 LAG	5 LAG	6 LAG	7 LAG
COEFF.	.6413	.1125	-.1649	-.1795	.1582	-.0144	.1405	.0307
S.E.'s	.2535	.1224	.1253	.1270	.1274	.1258	.1241	.1247

RSS = .70306D+02 σ = 1.02437
$CHI^2(7)=$ 11.320 with F(7, 67) = 1.17 [.3323]

ANALYSIS of SCALED RESIDUALS
Sample Size   111

Mean	.000000
Std.Devn.	.858116
Skewness	-.201071
Excess Kurtosis	-.609255
Minimum	-1.837720
Maximum	1.797985

CHI-SQUARED Test for NORMALITY :$CHI^2(2) =$ 1.799

TEST for HETEROSCEDASTIC ERRORS   111*R² =   26.3303 with 34 Variables

    F(33, 57) =   .5371 [.9715]

Regressors used for forming the Quadratic are:
 RSUCCES1 RSUCCES2 RSUCCES3 RSUCCES4 CONSTANT BLKNIGHT COOP   DSTRES
 POLICIES RELATE   COST   COST   1 COST   2 COST   3 GNPCST   GNPCST 1
 GNPCST 2 GNPCST 3 GNPRATIO LENGTH
HETEROSCEDASTICITY Coefficients and t-Values are:

Vars:	V 1	V 2	V 3	V 4	V 5	V 6
Coeff:	-.33724	.68535	.17350	-1.15780	-7.10475	.83304
t-Value	-.31	.61	.16	-1.04	-.85	.39
Vars:	V 7	V 8	V 9	V10	V11	V12
Coeff:	-1.07024	1.43615	.10691	1.66641	.13756	3.14939
t-Value	-.58	.68	.06	1.05	.04	.85
Vars:	V13	V14	V15	V16	V17	V18
Coeff:	5.27159	1.00520	-.36585	.13827	.48194	-.49678
t-Value	1.40	.27	-.97	.28	.91	-.94
Vars:	V19	V20	V 1²	V 2²	V 3²	V 4²
Coeff:	.00036	-.09344	.03363	-.05506	.02217	.14478
t-Value	.23	-.36	.30	-.48	.21	1.27
Vars:	V11²	V12²	V13²	V14²	V15²	V16²
Coeff:	.05562	-.71174	-1.13401	.00470	.00772	-.02357
t-Value	.06	-.83	-1.30	.01	.90	-.57
Vars:	V17²	V18²	V19²	V20²		
Coeff:	-.05509	.01242	-.000000016	.00023		
t-Value	-1.31	.29	-.34	.03		

Model OUTPUT from P C - G I V E

EQ(2) Modelling RSUCCESS by OLS
The Sample is   5 to 115 less 0 Forecasts

VARIABLE	COEFFICIENT	STD ERROR	H.C.S.E.	t-VALUE	PARTIAL r²
RSUCCES1	.0159221	.10943	.10785	.14550	.0003
RSUCCES2	-.1197499	.10259	.09385	-1.16724	.0161
RSUCCES3	-.0110007	.10027	.09876	-.10971	.0001
RSUCCES4	.0082826	.09706	.10053	.08534	.0001
CONSTANT	4.7312697	1.88045	1.66507	2.51603	.0709
BLKNIGHT	-.8555781	.75602	.74695	-1.13169	.0152
COOP	-1.0777398	.67131	.66615	-1.60543	.0301
DSTRES	.8863726	.68649	.73321	1.29117	.0197
POLICIES	-.6514188	.64807	.63034	-1.00517	.0120
RELATE	.1877313	.59322	.57210	.31646	.0012
COST	-.3338227	.41424	.41483	-.80586	.0078
COST 1	-.4887210	.36769	.34256	-1.32918	.0208
COST 2	.7976999	.34892	.31711	2.28617	.0592
COST 3	.2086473	.35977	.31713	.57994	.0040
GNPCST	.0480145	.05967	.05590	.80460	.0077
GNPCST 1	-.0477486	.10004	.09531	-.47731	.0027
GNPCST 2	.0235643	.10268	.08606	.22950	.0006
LENGTH	-.0338515	.03320	.03035	-1.01953	.0124
LENGTH 1	.0433168	.03331	.03686	1.30024	.0200
LENGTH 2	-.0473561	.03511	.03783	-1.34874	.0214
LENGTH 3	-.0212902	.03585	.03175	-.59387	.0042
LENGTH 4	.0746940	.03396	.03314	2.19964	.0551
PERCENTM	.0179284	.02555	.02358	.70172	.0059
PERCENTX	.0149657	.02115	.02033	.70770	.0060
TARCST	.0009515	.00041	.00029	2.30615	.0602
TARCST 1	-.0006408	.00041	.00027	-1.58145	.0293
TARCST 2	.0003386	.00041	.00037	.83257	.0083
TARCST 3	-.0008018	.00040	.00023	-2.01963	.0468

R² = .4095044 σ =   2.4385686 F(27, 83) =   2.13 [.0047] DW = 2.065
RSS =   493.5692124498   for 28 Variables and 111 Observations
Information Criteria: SC =   2.68; HQ =   2.27; FPE =   7.45
 R² Relative to DIFFERENCE+SEASONALS =   .71763

        SEASONAL MEANS of DIFFERENCES are
    -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   3.174   and F-Form(2, 81) =   1.19 [.3089]

Error Autocorrelation Coefficients:

   -.1142   .2942

                          ARCH TEST
Residuals Scaled by   .2439D+01

          CNST   1 LAG
COEFF.   .6760   .0916
S.E.'s · .1267   .1106

RSS =   .81694D+02   σ -   1.00428
CHI²(1)-   .923 with F(1, 81) =   .69 [.4101]
CHI-SQUARED Test for NORMALITY :CHI²(2) =   1.963

TEST for HETEROSCEDASTIC ERRORS 111*R² =   25.8603 with 34 Variables

   F(33, 57) =   .5246 [.9758]

        RESET F-TEST for adding Yhat²
        F(1, 82)   =   1.532   [.2194]

Testing for Serial Correlation from Lags 1 to 7

CHI²(7) =   5.638   and   F-Form(7, 76) =   .58 [.7693]

Error Autocorrelation Coefficients:

   -.0573   .2600   -.1663   -.0380   .0336   .1443   .0228

                          ARCH TEST
Residuals Scaled by   .2439D+01

          CNST   1 LAG   2 LAG   3 LAG   4 LAG   5 LAG   6 LAG   7 LAG
COEFF.   .6638   .1369   -.1989   -.1602   .1668   -.0702   .1776   .0215
S.E.'s   .2538   .1207   .1254   .1277   .1275   .1255   .1232   .1238

RSS =   .67697D+02   σ =   .99051
CHI²(7)=   12.266 with F(7, 69) =   1.32 [.2550]

        ANALYSIS of SCALED RESIDUALS
        Sample Size   111

        Mean   .000000
        Std.Devn.   .868646
        Skewness   -.149326
        Excess Kurtosis   -.691700
        Minimum   -1.959489
        Maximum   1.796912

CHI-SQUARED Test for NORMALITY :CHI²(2) =   1.963

TEST for HETEROSCEDASTIC ERRORS 111*R² =   25.8603 with 34 Variables

   F(33, 57) =   .5246 [.9758]

Regressors used for forming the Quadratic are:
 RSUCCES1 RSUCCES2 RSUCCES3 RSUCCES4 CONSTANT BLKNIGHT COOP   DSTRES
 POLICIES RELATE   COST   COST 1 COST 2 COST 3 GNPCST   GNPCST 1
 GNPCST 2 LENGTH   LENGTH 1 LENGTH 2
HETEROSCEDASTICITY Coefficients and t-Values are:

Vars:	V 1	V 2	V 3	V 4	V 5	V 6
Coeff:	.24706	.46895	.48137	-.61463	-12.16784	.48501
t-Value	.22	.41	.46	-.55	-1.43	.24
Vars:	V 7	V 8	V 9	V10	V11	V12
Coeff:	-.31881	1.46260	-.56452	1.23465	-.91516	4.16807
t-Value	-.17	.79	-.32	.78	-.24	1.14
Vars:	V13	V14	V15	V16	V17	V18
Coeff:	4.99185	1.72709	-.32373	.16543	.61351	-.02079
t-Value	1.34	.46	-.92	.33	1.14	-.08
Vars:	V19	V20	V 1²	V 2²	V 3²	V 4²
Coeff:	.10811	.17581	-.02138	-.01974	-.01060	.09309
t-Value	.39	.64	-.18	-.17	-.10	.83
Vars:	V11²	V12²	V13²	V14²	V15²	V16²
Coeff:	.35759	-.93826	-1.10285	-.21971	.00645	-.03335
t-Value	.41	-1.11	-1.27	-.26	.80	-.77
Vars:	V17²	V18²	V19²	V20²		

```
Coeff:        -.06312      -.00129      -.00090      -.00142
t-Value        -1.48         -.19         -.13         -.20
```

Model OUTPUT from P C - G I V E

EQ(3) Modelling RSUCCESS by OLS
The Sample is   5 to 115 less   0 Forecasts

VARIABLE	COEFFICIENT	STD ERROR	H.C.S.E.	t-VALUE	PARTIAL r²
RSUCCES1	.0063107	.10277	.10149	.06141	.0000
RSUCCES2	-.1185369	.09605	.08507	-1.23411	.0174
RSUCCES3	-.0045892	.09529	.09122	-.04816	.0000
RSUCCES4	.0020977	.09168	.09332	.02288	.0000
CONSTANT	4.6521544	1.73594	1.46265	2.67991	.0771
BLKNIGHT	-.8699997	.71576	.66545	-1.21549	.0169
COOP	-1.0014149	.65376	.65612	-1.53178	.0266
DSTRES	.9477207	.67051	.70772	1.41344	.0227
POLICIES	-.6506728	.63967	.61723	-1.01720	.0119
RELATE	.2245900	.57202	.55377	.39262	.0018
COST	-.3758973	.39890	.39652	-.94233	.0102
COST 1	-.4991474	.34198	.32238	-1.45959	.0242
COST 2	.8372078	.32805	.30358	2.55209	.0704
COST 3	.1723284	.34666	.31465	.49711	.0029
GNPCST	.0482891	.05880	.05558	.82130	.0078
LENGTH	-.0310007	.03232	.02872	-.95905	.0106
LENGTH 1	.0467143	.03198	.03590	1.46092	.0242
LENGTH 2	-.0580629	.03185	.03540	-1.82310	.0372
LENGTH 4	.0710955	.03090	.02765	2.30106	.0580
PERCENTM	.0202918	.02498	.02337	.81220	.0076
PERCENTX	.0150015	.02070	.02040	.72476	.0061
TARCST	.0009537	.00041	.00030	2.35227	.0604
TARCST 1	-.0006305	.00040	.00029	-1.57879	.0282
TARCST 2	.0002985	.00040	.00036	.74926	.0065
TARCST 3	-.0007832	.00039	.00024	-2.00388	.0446

R^2 = .4033957 σ =   2.4080177 F(24, 86) =   2.42 [.0015] DW = 2.082
 RSS =   498.6752381588   for 25 Variables and 111 Observations
Information Criteria: SC =   2.56; HQ =   2.20; FPE =   7.10
 R^2 Relative to DIFFERENCE+SEASONALS =   .71471

        SEASONAL MEANS of DIFFERENCES are
      -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   4.214   and   F-Form(2, 84) =   1.66 [.1968]

Error Autocorrelation Coefficients:

   -.1474   .3260

                         ARCH TEST
Residuals Scaled by   .2408D+01

         CNST   1 LAG
COEFF.   .7031   .0860
S.E.'s   .1272   .1086

RSS =   .83723D+02   σ =   .99835
CHI²(1)=   .816 with F(1, 84) =   .63 [.4305]
CHI-SQUARED Test for NORMALITY :CHI²(2) =   2.165

TEST for HETEROSCEDASTIC ERRORS 111*R^2 =   24.7806 with 34 Variables

   F(33, 57) =   .4964 [.9837]

      RESET F-TEST for adding Yhat²
        F(1, 85)   =   2.133 [.1478]

Model OUTPUT from P C - G I V E

```
EQ( 4) Modelling RSUCCESS by OLS
The Sample is    5 to   115 less   0 Forecasts

    VARIABLE     COEFFICIENT    STD ERROR     H.C.S.E.    t-VALUE  PARTIAL r²
RSUCCES2        -.1237286        .09514        .08216     -1.30042     .0189
RSUCCES3         .0101487        .09276        .08547       .10941     .0001
RSUCCES4        -.0010201        .09082        .09052      -.01123     .0000
CONSTANT        4.5164064       1.66138       1.36079      2.71847     .0775
BLKNIGHT        -.8913514        .70964        .65970     -1.25607     .0176
COOP            -.9822509        .64648        .64835     -1.51938     .0256
DSTRES          1.0066203        .65332        .66603      1.54079     .0263
POLICIES        -.5641345        .62674        .60781      -.90012     .0091
RELATE           .1554511        .56118        .54736       .27701     .0009
COST            -.2886574        .37487        .37603      -.77002     .0067
COST     1      -.5103976        .33441        .31858     -1.52625     .0258
COST     2       .8030402        .32080        .30498      2.50324     .0665
COST     3       .1648831        .33747        .32413       .48859     .0027
LENGTH          -.0340736        .03187        .02707     -1.06916     .0128
LENGTH 1         .0517298        .03093        .03503      1.67256     .0308
LENGTH 2        -.0589184        .03158        .03511     -1.86548     .0380
LENGTH 4         .0715200        .03055        .02750      2.34104     .0586
PERCENTM         .0257079        .02231        .02039      1.15247     .0149
PERCENTX         .0148377        .01999        .01930       .74223     .0062
TARCST           .0009551        .00040        .00028      2.39298     .0611
TARCST 1        -.0005808        .00039        .00027     -1.50702     .0252
TARCST 2         .0002989        .00039        .00035       .77420     .0068
TARCST 3        -.0007738        .00038        .00023     -2.01872     .0443
```

R² = .3984114   σ =   2.3904197 F(22, 88) =   2.65 [.0007] DW = 2.156
RSS =   502.8413420234   for 23 Variables and 111 Observations
Information Criteria: SC =   2.49; HQ =   2.15; FPE =   6.90
R² Relative to DIFFERENCE+SEASONALS =   .71233

            SEASONAL MEANS of DIFFERENCES are
      -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   4.479   and   F-Form(2, 86) =   1.81 [.1702]

Error Autocorrelation Coefficients:

   -.0699   .3450

                            ARCH TEST
Residuals Scaled by   .2390D+01

         CNST   1 LAG
COEFF.   .7238   .0809
S.E.'s   .1301   .1077

RSS =   .89805D+02   σ =   1.02188
CHI²(1)=   .717 with F(1, 86) =   .56 [.4547]
CHI-SQUARED Test for NORMALITY :CHI²(2) =   2.146

TEST for HETEROSCEDASTIC ERRORS 111*R² =   29.6395 with 34 Variables

   F(33, 57) =   .6292 [.9230]

      RESET F-TEST for adding Yhat²
       F(1, 87)   =   1.808 [.1823]

Model OUTPUT from P C - G I V E


```
EQ( 5) Modelling RSUCCESS by OLS
The Sample is    5 to   115 less   0 Forecasts

    VARIABLE     COEFFICIENT    STD ERROR     H.C.S.E.    t-VALUE  PARTIAL r²
RSUCCES2        -.1229717        .09236        .08216     -1.33147     .0191
CONSTANT        4.6040584       1.36062       1.19435      3.38379     .1118
BLKNIGHT        -.8615256        .68211        .65292     -1.26302     .0172
COOP            -.9811859        .62414        .62800     -1.57207     .0264
DSTRES          1.0203156        .63331        .64895      1.61109     .0277
POLICIES        -.5628794        .61013        .59332      -.92256     .0093
```

```
COST           -.2841768        .36689        .37542        -.77455      .0065
COST     1     -.5054776        .32690        .31005       -1.54629      .0256
COST     2      .8004167        .31005        .30124        2.58161      .0682
COST     3      .1388152        .31788        .31962         .43669      .0021
LENGTH         -.0358685        .03048        .02657       -1.17671      .0150
LENGTH   1      .0530569        .02939        .03418        1.80522      .0346
LENGTH   2     -.0582409        .03045        .03437       -1.91273      .0386
LENGTH   4      .0720928        .02948        .02700        2.44552      .0617
PERCENTM        .0264486        .02173        .02044        1.21689      .0160
PERCENTX        .0151832        .01958        .01886         .77558      .0066
TARCST          .0009551        .00039        .00028        2.44088      .0614
TARCST   1     -.0005771        .00036        .00027       -1.58367      .0268
TARCST   2      .0002999        .00037        .00034         .80545      .0071
TARCST   3     -.0007590        .00037        .00021       -2.03546      .0435
```

R^2 = .3977976 σ =   2.3518858 F(19, 91) =   3.16 [.0001] DW = 2.156
RSS =   503.3543726349   for 20 Variables and 111 Observations
Information Criteria: SC =   2.36; HQ =   2.07; FPE =   6.53
R^2 Relative to DIFFERENCE+SEASONALS =   .71203

          SEASONAL MEANS of DIFFERENCES are
     -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI^2(2) =   3.967   and   F-Form(2, 89) =   1.65 [.1980]

Error Autocorrelation Coefficients:

   -.0735   .3048

                          ARCH TEST
Residuals Scaled by   .2352D+01

          CNST   1 LAG
COEFF.   .7485   .0815
S.E.'s   .1312   .1059

RSS =   .93442D+02 σ =   1.02465
CHI^2(1)=   .727 with F(1, 89) =   .59 [.4435]
CHI-SQUARED Test for NORMALITY :CHI^2(2) =   2.359

TEST for HETEROSCEDASTIC ERRORS 111*R^2 =   28.3175 with 35 Variables

     F(34, 56) =   .5641 [.9619]

          RESET F-TEST for adding Yhat^2
          F(1, 90)   =   1.905 [.1710]

Model OUTPUT from P C - G I V E

EQ(6) Modelling RSUCCESS by OLS
The Sample is   5 to 115 less 0 Forecasts

```
VARIABLE    COEFFICIENT    STD ERROR    H.C.S.E.    t-VALUE  PARTIAL r²
CONSTANT     3.2821609     1.00916      1.00765      3.25238    .1011
BLKNIGHT     -.9609569      .65130       .64601     -1.47544    .0226
COOP        -1.1413293      .60315       .62852     -1.89229    .0367
DSTRES       1.2657470      .58036       .57883      2.18096    .0482
COST     1   -.5123696      .31633       .30747     -1.61974    .0272
COST     2    .8580056      .30253       .30439      2.83613    .0788
COST     3    .0939018      .31481       .33400       .29828    .0009
LENGTH       -.0318588      .03028       .02580     -1.05230    .0116
LENGTH   1    .0500019      .02899       .03396      1.72475    .0307
LENGTH   2   -.0509018      .02949       .03292     -1.72616    .0307
LENGTH   4    .0723138      .02723       .02567      2.65524    .0698
PERCENTM      .0253593      .02182       .02064      1.16203    .0142
PERCENTX      .0123832      .01954       .01858       .63382    .0043
TARCST        .0010334      .00039       .00021      2.67506    .0707
TARCST   1   -.0005484      .00036       .00023     -1.51565    .0239
TARCST   2    .0002646      .00037       .00032       .71805    .0055
TARCST   3   -.0006309      .00037       .00023     -1.71112    .0302
```

R^2 = .3710834 σ =   2.3648211 F(16, 94) =   3.47 [.0001] DW = 2.161

```
RSS =        525.6836311271       for 17 Variables and 111 Observations
Information Criteria:  SC =          2.28;  HQ =          2.03;  FPE =        6.45
R² Relative to DIFFERENCE+SEASONALS =     .69926
```

SEASONAL MEANS of DIFFERENCES are
    -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   1.011   and   F-Form(2, 92) =   .42 [.6566]

Error Autocorrelation Coefficients:

    -.0987   .0027

ARCH TEST
Residuals Scaled by   .2365D+01

```
          CNST    1 LAG
COEFF.    .7595   .0881
S.E.'s    .1314   .1033
```

```
RSS =     .96062D+02     σ =       1.02184
CHI²( 1)=         .863 with  F( 1, 92) =          .73 [ .3960]
CHI-SQUARED Test for NORMALITY :CHI²(2) =         2.553
```

TEST for HETEROSCEDASTIC ERRORS 111*R² =   28.5938 with 30 Variables

    F(29, 64) =   .7658 [.7834]

        RESET F-TEST for adding Yhat²
        F(1, 93)   =   1.363 [.2461]

Model OUTPUT from P C - G I V E

EQ(7) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts

VARIABLE	COEFFICIENT	STD ERROR	H.C.S.E.	t-VALUE	PARTIAL r²
CONSTANT	3.4543143	.90387	.91392	3.82171	.1309
BLKNIGHT	-.9166008	.62787	.62053	-1.45986	.0215
COOP	-1.1343939	.57879	.60319	-1.95994	.0381
DSTRES	1.3115958	.56616	.56039	2.31667	.0524
COST 1	-.5056587	.30550	.29172	-1.65519	.0275
COST 2	.8874334	.29741	.30037	2.98386	.0841
LENGTH	-.0299710	.02979	.02499	-1.00607	.0103
LENGTH 1	.0481723	.02836	.03288	1.69872	.0289
LENGTH 2	-.0541441	.02869	.03181	-1.88701	.0354
LENGTH 4	.0704873	.02686	.02573	2.62451	.0663
PERCENTM	.0374672	.01046	.00909	3.58254	.1169
TARCST	.0010184	.00038	.00021	2.68179	.0690
TARCST 1	-.0005504	.00036	.00024	-1.54360	.0240
TARCST 3	-.0006100	.00036	.00024	-1.67677	.0282

```
R² = .3646628  σ =       2.3398174  F(13, 97) =       4.28 [ .0000]  DW = 2.173
RSS =        531.0503054067       for 14 Variables and 111 Observations
Information Criteria:  SC =          2.16;  HQ =          1.96;  FPE =        6.17
R² Relative to DIFFERENCE+SEASONALS =     .69619
```

SEASONAL MEANS of DIFFERENCES are
    -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   1.158   and   F-Form(2, 95) =   .50 [.6076]

Error Autocorrelation Coefficients:

    -.1052   -.0104

ARCH TEST
Residuals Scaled by   .2340D+01

          CNST   1 LAG

```
COEFF.     .8112    .0555
S.E.'s     .1336    .1017

RSS =     .10250D+03    σ =     1.03870
CHI²( 1)=         .344 with  F( 1, 95) =         .30 [ .5865]
CHI-SQUARED Test for NORMALITY :CHI²(2) =      2.737

TEST for HETEROSCEDASTIC ERRORS  111*R² =      22.5885 with 24 Variables

    F(23,  73) =          .8109 [ .7074]


        RESET F-TEST for adding  Yhat²
         F( 1, 96)  =          1.474  [ .2277]

Model OUTPUT from P C - G I V E
```

```
EQ( 8) Modelling RSUCCESS by OLS
The Sample is   5 to  115 less  0 Forecasts
```

VARIABLE	COEFFICIENT	STD ERROR	H.C.S.E.	t-VALUE	PARTIAL r²
CONSTANT	3.4433000	.88672	.92741	3.88318	.1322
BLKNIGHT	-1.0997460	.58835	.58050	-1.86920	.0341
COOP	-1.1735997	.58024	.58601	-2.02263	.0397
DSTRES	1.3063889	.56441	.55073	2.31459	.0513
COST 1	-.3802970	.29887	.33327	-1.27243	.0161
COST 2	.8423133	.29804	.31493	2.82619	.0747
LENGTH 2	-.0390831	.02754	.03190	-1.41936	.0199
LENGTH 4	.0613442	.02651	.02491	2.31371	.0513
PERCENTM	.0367540	.01050	.00939	3.50022	.1101
TARCST	.0010660	.00038	.00019	2.80942	.0738
TARCST 1	-.0005914	.00036	.00024	-1.65252	.0268
TARCST 3	-.0005596	.00036	.00020	-1.53485	.0232

```
R² = .3439764  σ =     2.3534655  F(11, 99) =     4.72 [ .0000]  DW = 2.169
 RSS =      548.3411641640    for 12 Variables and 111 Observations
Information Criteria: SC =        2.11;  HQ =        1.93;  FPE =        6.14
 R² Relative to DIFFERENCE+SEASONALS =    .68630

        SEASONAL MEANS of DIFFERENCES are
      -.01818

Testing for Serial Correlation from Lags  1 to  2

CHI²( 2) =        1.417    and   F-Form(  2, 97) =        .63 [ .5363]

Error Autocorrelation Coefficients:

   -.1076   -.0569

                        ARCH TEST
Residuals Scaled by    .2353D+01

        CNST   1 LAG
COEFF.   .8930  -.0158
S.E.'s   .1390   .1010

RSS =     .11802D+03    σ =     1.10306
CHI²( 1)=         .028 with  F( 1, 97) =         .02 [ .8758]
CHI-SQUARED Test for NORMALITY :CHI²(2) =      1.801

TEST for HETEROSCEDASTIC ERRORS  111*R² =      14.2013 with 20 Variables

    F(19,  79) =          .6100 [ .8881]


        RESET F-TEST for adding  Yhat²
         F( 1, 98)  =          1.829  [ .1794]

Model OUTPUT from P C - G I V E


EQ( 9) Modelling RSUCCESS by OLS
```

The Sample is   5 to   115 less   0 Forecasts

VARIABLE	COEFFICIENT	STD ERROR	H.C.S.E.	t-VALUE	PARTIAL r²
CONSTANT	2.6005438	.70076	.66745	3.71103	.1200
BLKNIGHT	-1.2375551	.58368	.57653	-2.12027	.0426
COOP	-.9214438	.56495	.56405	-1.63101	.0257
DSTRES	1.4627989	.56270	.53175	2.59958	.0627
COST 2	.7778134	.29722	.30607	2.61695	.0635
LENGTH 4	.0623961	.02630	.02539	2.37236	.0528
PERCENTM	.0345574	.01035	.00997	3.33891	.0994
TARCST	.0010083	.00038	.00016	2.64515	.0648
TARCST 1	-.0006032	.00036	.00030	-1.67335	.0270
TARCST 3	-.0005317	.00036	.00017	-1.45899	.0206

R² = .3201353 σ =   2.3720086 F(9,101) =   5.28 [.0000] DW = 2.130
RSS =   568.2689094206   for 10 Variables and 111 Observations
Information Criteria: SC =   2.06; HQ =   1.91; FPE =   6.13
R² Relative to DIFFERENCE+SEASONALS =   .67490

        SEASONAL MEANS of DIFFERENCES are
    -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   1.229   and   F-Form(2, 99) =   .55 [.5764]

Error Autocorrelation Coefficients:

   -.0904   -.0745

                          ARCH TEST
Residuals Scaled by   .2372D+01

         CNST   1 LAG
COEFF.   .9106 -.0147
S.E.'s   .1372   .1000

RSS =   .11334D+03   σ =   1.06999
CHI²(1)=   .024 with F(1, 99) =   .02 [.8833]
CHI-SQUARED Test for NORMALITY :CHI²(2) =   2.663

TEST for HETEROSCEDASTIC ERRORS 111*R² =   10.6738 with 16 Variables

    F(15, 85) =   .6029 [.8649]

        RESET F-TEST for adding Yhat²
        F(1,100)   =   1.263 [.2637]

Model OUTPUT from P C - G I V E

EQ(10) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts

VARIABLE	COEFFICIENT	STD ERROR	H.C.S.E.	t-VALUE	PARTIAL r²
CONSTANT	2.3135143	.69370	.69684	3.33684	.0975
BLKNIGHT	-1.4281698	.58434	.61182	-2.44408	.0548
COOP	-.7545279	.56724	.58845	-1.33018	.0169
DSTRES	1.4344275	.56945	.53838	2.51898	.0580
COST 2	.8104968	.29773	.32450	2.72224	.0671
LENGTH 4	.0641996	.02664	.02915	2.41001	.0534
PERCENTM	.0352171	.01048	.01039	3.35934	.0987
TARCST	.0010048	.00039	.00017	2.60470	.0618

R² = .2876045 σ =   2.4044053 F(7,103) =   5.94 [.0000] DW = 2.159
RSS =   595.4599724654   for 8 Variables and 111 Observations
Information Criteria: SC =   2.02; HQ =   1.90; FPE =   6.20
R² Relative to DIFFERENCE+SEASONALS =   .65934

        SEASONAL MEANS of DIFFERENCES are
    -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   1.296   and   F-Form(2,101) =   .60 [.5525]

Error Autocorrelation Coefficients:

   -.1039   -.0571

                              ARCH TEST
Residuals Scaled by   .2404D+01

          CNST   1 LAG
COEFF.   .9311   -.0161
S.E.'s   .1378   .0991

RSS =   .11521D+03   σ =   1.06805
CHI²(1)=   .029 with F(1,101) =   .03 [.8715]
CHI-SQUARED Test for NORMALITY :CHI²(2) =   2.780

TEST for HETEROSCEDASTIC ERRORS 111*R² =   10.4211 with 12 Variables

   F(11, 91) =   .8571 [.5844]

       RESET F-TEST for adding Yhat²
        F(1,102)   =   1.147 [.2868]

Model OUTPUT from P C - G I V E

   EQ(11) Modelling RSUCCESS by OLS
   The Sample is   5 to 115 less   0 Forecasts

   VARIABLE   COEFFICIENT   STD ERROR   H.C.S.E.   t-VALUE PARTIAL r²
   CONSTANT   2.2579175   .69500   .69735   3.24880   .0921
   BLKNIGHT   -1.6686837   .55771   .59821   -2.99202   .0793
   DSTRES   1.4482112   .57145   .52523   2.53425   .0582
   COST   2   .7906051   .29845   .31967   2.64900   .0632
   LENGTH 4   .0650850   .02673   .03051   2.43503   .0539
   PERCENTM   .0331413   .01040   .01026   3.18519   .0889
   TARCST   .0008640   .00037   .00015   2.32053   .0492

R² = .2753667 σ =   2.4132825 F(6,104) =   6.59 [.0000] DW = 2.164
 RSS =   605.6889938162   for 7 Variables and 111 Observations
Information Criteria: SC =   1.99; HQ =   1.89; FPE =   6.19
 R² Relative to DIFFERENCE+SEASONALS =   .65349

       SEASONAL MEANS of DIFFERENCES are
       -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   1.154   and   F-Form(2,102) =   .54 [.5869]

Error Autocorrelation Coefficients:

   -.1014   -.0436

                              ARCH TEST
Residuals Scaled by   .2413D+01

          CNST   1 LAG
COEFF.   .9268   .0047
S.E.'s   .1392   .0992

RSS =   .11884D+03   σ =   1.07938
CHI²(1)=   .002 with F(1,102) =   .00 [.9625]
CHI-SQUARED Test for NORMALITY :CHI²(2) =   2.790

TEST for HETEROSCEDASTIC ERRORS 111*R² =   11.3404 with 11 Variables

   F(10, 93) =   1.0583 [.4023]

       RESET F-TEST for adding Yhat²
        F(1,103)   =   .804 [.3720]

                              RESIDUAL CORRELOGRAM
   111*(Sum of 16 Squared Residual Autocorrelations) =   12.540
        1   2   3   4   5   6   7

```
  -.0902   -.0308   -.0226    .0954   -.0336    .0927   -.0860
      8        9       10       11       12       13       14
  -.0197    .0478   -.1420   -.1920    .0258   -.0055   -.0689
     15       16
   .1065    .0258
```

RESIDUAL AUTOREGRESSION of Order   12

LAG	1	2	3	4	5	6	7	8
COEFF.	-.0745	-.0336	-.0261	.0917	-.0468	.1418	-.0717	-.0467
S.E.'s	.1118	.1123	.1098	.1109	.1113	.1084	.1081	.1092
LAG	9	10	11	12				
COEFF.	.0162	-.1910	-.1879	-.0259				
S.E.'s	.1085	.1068	.1088	.1092				

```
RSS =      .46489D+03     σ =      2.41062
CHI²(12)=      10.729 with  F(12, 80) =          .81 [ .6390]
```

General TEST of FUNCTIONAL FORM 111*R² =   33.8897 with 26 Variables

```
    F(25,   77) =        1.3536 [ .1578]
```

Regressors used for forming the Quadratic are:
 CONSTANT BLKNIGHT DSTRES   COST   2 LENGTH 4 PERCENTM TARCST
HETEROSCEDASTICITY Coefficients and t-Values are:

Vars:	V1 * V1	V2 * V1	V3 * V1	V3 * V2	V4 * V1	V4 * V2
Coeff:	2.37940	-14.20482	4.18022	2.70444	2.02983	5.07042
t-Value	.49	-2.87	.90	.63	.52	2.54
Vars:	V4 * V3	V4 * V4	V5 * V1	V5 * V2	V5 * V3	V5 * V4
Coeff:	-1.07284	-.05898	-.12264	.24621	-.09730	-.06673
t-Value	-.54	-.07	-.29	1.14	-.57	-.47
Vars:	V5 * V5	V6 * V1	V6 * V2	V6 * V3	V6 * V4	V6 * V5
Coeff:	.00382	.18139	.09912	-.10379	-.04103	.00416
t-Value	.50	1.58	1.45	-1.19	-1.17	.64
Vars:	V6 * V6	V7 * V1	V7 * V2	V7 * V3	V7 * V4	V7 * V5
Coeff:	-.00115	.00824	-.00429	-.00467	-.000030259	-.00093
t-Value	-1.09	.56	-.49	-.71	-.01	-1.11
Vars:	V7 * V6	V7 * V7				
Coeff:	-.00048	.000000641				
t-Value	-1.78	.27				

Model OUTPUT from P C - G I V E

Outcomes for the first 28 OBSERVATIONS :

M E A N S   of   V A R I A B L E S

RSUCCESS	CONSTANT	BLKNIGHT	DSTRES	COST 2	LENGTH 4	PERCENTM
5.1071	1.0000	.3214	.0714	2.0714	9.1786	25.4286

TARCST						
105.7857						

STANDARD DEVIATIONS OF VARIABLES

RSUCCESS	CONSTANT	BLKNIGHT	DSTRES	COST 2	LENGTH 4	PERCENTM
3.0712	.0000	.4756	.2623	.8133	14.2180	25.9833

TARCST						
191.4199						

D U R B I N - W A T S O N   TESTS

RSUCCESS	CONSTANT	BLKNIGHT	DSTRES	COST 2	LENGTH 4	PERCENTM
2.0182	.0000	1.9649	1.6154	1.9040	1.4694	2.2352

TARCST						
2.5290						

CORRELATION MATRIX

	RSUCCESS	CONSTANT	BLKNIGHT	DSTRES	COST	2 LENGTH	4 PERCENTM	TARCST
RSUCCESS	1.0000							
CONSTANT	.0000	1.0000						
BLKNIGHT	-.5569	.0000	1.0000					
DSTRES	.2660	.0000	-.1909	1.0000				
COST 2	.1896	.0000	-.0616	-.1985	1.0000			
LENGTH 4	.0284	.0000	-.0964	.2348	-.1645	1.0000		
PERCENTM	.2175	.0000	-.1998	.0660	.0809	-.4121	1.0000	
TARCST	.0645	.0000	.4695	-.1406	.2632	-.2274	-.1336	1.0000

EQ(12) Modelling RSUCCESS by RLS

The Sample is   5 to 115 less 0 Forecasts

VARIABLE	COEFFICIENT	STD ERROR	H.C.S.E.	t-VALUE	PARTIAL r²
CONSTANT	2.2579175	.69500	.69735	3.24880	.0921
BLKNIGHT	-1.6686837	.55771	.59821	-2.99202	.0793
DSTRES	1.4482112	.57145	.52523	2.53425	.0582
COST 2	.7906051	.29845	.31967	2.64900	.0632
LENGTH 4	.0650850	.02673	.03051	2.43503	.0539
PERCENTM	.0331413	.01040	.01026	3.18519	.0889
TARCST	.0008640	.00037	.00015	2.32053	.0492

R² = .2753667 σ =   2.4132825 F(6,104) =   6.59 [.0000] DW = 2.164
RSS =   605.6889938162   for 7 Variables and 111 Observations
Information Criteria: SC =   1.99; HQ =   1.89; FPE =   6.19
t(82) for a Zero Sample Innovation Mean =   -1.09
R² Relative to DIFFERENCE+SEASONALS =   .65349

        SEASONAL MEANS of DIFFERENCES are
     -.01818

Testing for Serial Correlation from Lags 1 to 2

CHI²(2) =   1.154   and   F-Form(2,102) =   .54 [.5869]

Error Autocorrelation Coefficients:

   -.1014   -.0436

                          ARCH TEST
Residuals Scaled by   .2413D+01

        CNST   1 LAG
COEFF. .9268 .0047
S.E.'s .1392 .0992

RSS =   .11884D+03   σ =   1.07938
CHI²(1)=   .002 with F(1,102) =   .00 [.9625]
CHI-SQUARED Test for NORMALITY :CHI²(2) =   2.790

TEST for HETEROSCEDASTIC ERRORS 111*R² =   11.3404 with 11 Variables

    F(10, 93) =   1.0583 [.4023]

                      PROGRESS to DATE:

MODEL	PARAMETERS	RSS	σ	SCHWARZ Criterion
1	30	484.32622091	2.44526810	2.74607449
2	28	493.56921245	2.43856864	2.68012250
3	25	498.67523816	2.40801771	2.56312986
4	23	502.84134202	2.39041966	2.48659310
5	20	503.35437263	2.35188578	2.36032824
6	17	525.68363113	2.36482115	2.27644877
7	14	531.05030541	2.33981739	2.15932135
8	12	548.34116416	2.35346545	2.10650585
9	10	568.26890942	2.37200861	2.05734654
10	8	595.45997247	2.40440529	2.01922957
11	7	605.68899382	2.41328254	1.99383384

Econometric Modelling Session Finished at
11:39: 9 on 31st July   1992

Output for c:\thesis\append.EQN
 Begun at
11: 2:52 on 31st July   1992

Data came from the Input Files: c:\thesis\ecnscn.INF   and c:\thesis\ecnscn.BIN

EQ(1) Modelling RSUCCESS by OLS
 The Sample is   5 to 115 less 0 Forecasts
       RSUCCESS =   .032 RSUCCES1   -.121 RSUCCES2+   .014 RSUCCES3
SE   (.11049)   (.10306)   (.10291)
+   .011 RSUCCES4+   4.527   -.903 BLKNIGHT   -1.066 COOP
(.09870)   (1.90041)   (.76203)   (.68076)
+   .879 DSTRES   -.712 POLICIES+   .154 RELATE   -.365 COST
(.71292)   (.66124)   (.59711)   (.41697)
    -.472 COST   1+   .794 COST   2+   .292 COST   3+   .056 GNPCST
(.36948)   (.35019)   (.36688)   (.06019)
    -.036 GNPCST 1+   .013 GNPCST 2   -.115 GNPCST 3+   .000019 GNPRATIO

```
(        .10093)     (        .10394)     (        .09573)     (        .00008)
       -.031 LENGTH  +      .040 LENGTH 1    -.048 LENGTH 2    -.020 LENGTH 3
(        .03347)     (        .03355)     (        .03521)     (        .03605)
+       .084 LENGTH 4+      .017 PERCENTM+    .015 PERCENTX+    .001 TARCST
(        .03491)     (        .02577)     (        .02121)     (        .00042)
       -.001 TARCST 1+  .000340 TARCST 2    -.001 TARCST 3
(        .00041)     (        .00041)     (        .00040)
```

R² = .4205625 σ =   2.4452681 F(29, 81) =   2.03 [.0070] DW = 2.121
 RSS =   484.3262209063   for 30 Variables and 111 Observations
Information Criteria: SC =   2.75; HQ =   2.31; FPE =   7.60
 R² Relative to DIFFERENCE+SEASONALS =   .72292

STATIC LONG RUN

```
          RSUCCESS =     4.255              -.849 BLKNIGHT   -1.002 COOP
S.E.              (        1.27316)     (        .77727)    (        .65246)
+       .826 DSTRES        -.669 POLICIES+    .145 RELATE      .233 COST
(        .71233)     (        .63395)     (        .56406)     (        .61135)
       -.077 GNPCST  +   .000018 GNPRATIO+   .023 LENGTH       .016 PERCENTM
(        .18047)     (        .00008)     (        .07056)     (        .02351)
+       .014 PERCENTX   -.000138 TARCST
(        .02076)     (        .00075)
```

```
Mean =      4.963964   S.D. =       2.756572    σ  =     2.4452681
Chow   F[ 0.,   0.] =          .00  Normality Chi²(2)  =          1.80
AR 1- 2F[ 2.,  79.] =         1.71  ARCH 1 F[ 1.,  79.] =          .68
Xi²    F[33.,  47.] =          .54  RESET  F[ 1.,  80.] =         1.62
AR 1- 7F[ 7.,  74.] =          .76  ARCH 7 F[ 7.,  67.] =         1.17
Xi²    F[33.,  47.] =          .54
```

EQ(2) Modelling RSUCCESS by OLS
The Sample is   5 to 115 less 0 Forecasts
```
          RSUCCESS =     .016 RSUCCES1     -.120 RSUCCES2     -.011 RSUCCES3
SE                (        .10943)     (        .10259)     (        .10027)
+       .008 RSUCCES4+    4.731              -.856 BLKNIGHT   -1.078 COOP
(        .09706)     (        1.88045)     (        .75602)     (        .67131)
+       .886 DSTRES        -.651 POLICIES+    .188 RELATE      -.334 COST
(        .68649)     (        .64807)     (        .59322)     (        .41424)
       -.489 COST   1+     .798 COST    2+    .209 COST    3+    .048 GNPCST
(        .36769)     (        .34892)     (        .35977)     (        .05967)
       -.048 GNPCST 1+    .024 GNPCST 2     -.034 LENGTH  +    .043 LENGTH 1
(        .10004)     (        .10268)     (        .03320)     (        .03331)
       -.047 LENGTH 2     -.021 LENGTH 3+    .075 LENGTH 4+    .018 PERCENTM
(        .03511)     (        .03585)     (        .03396)     (        .02555)
+       .015 PERCENTX+    .001 TARCST       -.001 TARCST 1+  .000339 TARCST 2
(        .02115)     (        .00041)     (        .00041)     (        .00041)
       -.001 TARCST 3
(        .00040)
```

R² = .4095044 σ =   2.4385686 F(27, 83) =   2.13 [.0047] DW = 2.065
 RSS =   493.5692124498   for 28 Variables and 111 Observations
Information Criteria: SC =   2.68; HQ =   2.27; FPE =   7.45
 R² Relative to DIFFERENCE+SEASONALS =   .71763

```
Mean =      4.963964   S.D. =       2.756572    σ  =     2.4385686
Chow   F[ 0.,   0.] =          .00  Normality Chi²(2)  =          1.96
AR 1- 2F[ 2.,  81.] =         1.19  ARCH 1 F[ 1.,  81.] =          .69
Xi²    F[33.,  49.] =          .52  RESET  F[ 1.,  82.] =         1.53
AR 1- 7F[ 7.,  76.] =          .58  ARCH 7 F[ 7.,  69.] =         1.32
Xi²    F[33.,  49.] =          .52
```

EQ(3) Modelling RSUCCESS by OLS
The Sample is   5 to 115 less 0 Forecasts
```
          RSUCCESS =     .006 RSUCCES1     -.119 RSUCCES2     -.005 RSUCCES3
SE                (        .10277)     (        .09605)     (        .09529)
+       .002 RSUCCES4+    4.652              -.870 BLKNIGHT   -1.001 COOP
(        .09168)     (        1.73594)     (        .71576)     (        .65376)
+       .948 DSTRES        -.651 POLICIES+    .225 RELATE      -.376 COST
(        .67051)     (        .63967)     (        .57202)     (        .39890)
       -.499 COST   1+     .837 COST    2+    .172 COST    3+    .048 GNPCST
(        .34198)     (        .32805)     (        .34666)     (        .05880)
```

```
      -.031 LENGTH  +      .047 LENGTH 1      -.058 LENGTH 2+      .071 LENGTH  4
(       .03232)     (       .03198)     (       .03185)     (       .03090)
+     .020 PERCENTM+      .015 PERCENTX+     .001 TARCST        -.001 TARCST  1
(       .02498)     (       .02070)     (       .00041)     (       .00040)
+    .000299 TARCST 2    -.001 TARCST 3
(       .00040)     (       .00039)
```

R² = .4033957 σ =   2.4080177 F(24, 86) =   2.42 [.0015] DW = 2.082
RSS =   498.6752381588   for 25 Variables and 111 Observations
Information Criteria: SC =   2.56; HQ =   2.20; FPE =   7.10
R² Relative to DIFFERENCE+SEASONALS =   .71471

Mean =   4.963964 S.D. =   2.756572   σ =   2.4080177
Chow   F[0.,   0.] =   .00 Normality Chi²(2) =   2.17
AR 1- 2F[2., 84.] =   1.66 ARCH 1 F[1., 84.] =   .63
Xi²   F[33., 52.] =   .50 RESET F[1., 85.] =   2.13

EQ(4) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts
```
        RSUCCESS =      -.124 RSUCCES2+      .010 RSUCCES3      -.001 RSUCCES4
SE              (       .09514)     (       .09276)     (       .09082)
+     4.516           -.891 BLKNIGHT     -.982 COOP      +    1.007 DSTRES
(      1.66138)     (       .70964)     (       .64648)     (       .65332)
       -.564 POLICIES+     .155 RELATE       -.289 COST        -.510 COST    1
(       .62674)     (       .56118)     (       .37487)     (       .33441)
+     .803 COST    2+     .165 COST    3    -.034 LENGTH  +      .052 LENGTH 1
(       .32080)     (       .33747)     (       .03187)     (       .03093)
       -.059 LENGTH 2+     .072 LENGTH 4+     .026 PERCENTM+     .015 PERCENTX
(       .03158)     (       .03055)     (       .02231)     (       .01999)
+     .001 TARCST       -.001 TARCST 1+    .000299 TARCST 2    -.001 TARCST 3
(       .00040)     (       .00039)     (       .00039)     (       .00038)
```

R² = .3984114 σ =   2.3904197 F(22, 88) =   2.65 [.0007] DW = 2.156
RSS =   502.8413420234   for 23 Variables and 111 Observations
Information Criteria: SC =   2.49; HQ =   2.15; FPE =   6.90
R² Relative to DIFFERENCE+SEASONALS =   .71233

Mean =   4.963964 S.D. =   2.756572   σ =   2.3904197
Chow   F[0.,   0.] =   .00 Normality Chi²(2) =   2.15
AR 1- 2F[2., 86.] =   1.81 ARCH 1 F[1., 86.] =   .56
Xi²   F[33., 54.] =   .63 RESET F[1., 87.] =   1.81

EQ(5) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts
```
        RSUCCESS =      -.123 RSUCCES2+     4.604           -.862 BLKNIGHT
SE              (       .09236)     (      1.36062)     (       .68211)
       -.981 COOP      +    1.020 DSTRES       -.563 POLICIES     -.284 COST
(       .62414)     (       .63331)     (       .61013)     (       .36689)
       -.505 COST    1+     .800 COST    2+     .139 COST    3    -.036 LENGTH
(       .32690)     (       .31005)     (       .31788)     (       .03048)
+     .053 LENGTH 1    -.058 LENGTH 2+     .072 LENGTH 4+     .026 PERCENTM
(       .02939)     (       .03045)     (       .02948)     (       .02173)
+     .015 PERCENTX+     .001 TARCST       -.001 TARCST 1+    .000300 TARCST 2
(       .01958)     (       .00039)     (       .00036)     (       .00037)
       -.001 TARCST 3
(       .00037)
```

R² = .3977976 σ =   2.3518858 F(19, 91) =   3.16 [.0001] DW = 2.156
RSS =   503.3543726349   for 20 Variables and 111 Observations
Information Criteria: SC =   2.36; HQ =   2.07; FPE =   6.53
R² Relative to DIFFERENCE+SEASONALS =   .71203

Mean =   4.963964 S.D. =   2.756572   σ =   2.3518858
Chow   F[0.,   0.] =   .00 Normality Chi²(2) =   2.36
AR 1- 2F[2., 89.] =   1.65 ARCH 1 F[1., 89.] =   .59
Xi²   F[34., 56.] =   .56 RESET F[1., 90.] =   1.90

EQ(6) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts

```
         RSUCCESS =      3.282            -.961 BLKNIGHT    -1.141 COOP
SE            (      1.00916)      (       .65130)    (       .60315)
+   1.266 DSTRES         -.512 COST   1+    .858 COST    2+   .094 COST    3
(       .58036)    (       .31633)   (       .30253)    (       .31481)
       -.032 LENGTH +     .050 LENGTH 1    -.051 LENGTH 2+   .072 LENGTH 4
(       .03028)    (       .02899)   (       .02949)    (       .02723)
+     .025 PERCENTM+     .012 PERCENTX+   .001 TARCST      -.001 TARCST 1
(       .02182)    (       .01954)   (       .00039)    (       .00036)
+   .000265 TARCST 2    -.001 TARCST 3
(       .00037)    (       .00037)
```

R² = .3710834 σ =   2.3648211 F(16, 94) =   3.47 [.0001] DW = 2.161
RSS =   525.6836311271   for 17 Variables and 111 Observations
Information Criteria: SC =   2.28; HQ =   2.03; FPE =   6.45
R² Relative to DIFFERENCE+SEASONALS =   .69926

```
Mean =         4.963964   S.D. =       2.756572    σ  =      2.3648211
Chow   F[ 0.,   0.] =              .00  Normality Chi²(2)   =         2.55
AR 1- 2F[ 2.,  92.] =              .42  ARCH 1 F[ 1.,  92.] =          .73
Xi²    F[29.,  64.] =              .77  RESET  F[ 1.,  93.] =         1.36
```

EQ(7) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts
```
         RSUCCESS =      3.454            -.917 BLKNIGHT    -1.134 COOP
SE            (       .90387)      (       .62787)    (       .57879)
+   1.312 DSTRES         -.506 COST   1+    .887 COST    2    -.030 LENGTH
(       .56616)    (       .30550)   (       .29741)    (       .02979)
+     .048 LENGTH 1     -.054 LENGTH 2+    .070 LENGTH 4+   .037 PERCENTM
(       .02836)    (       .02869)   (       .02686)    (       .01046)
+     .001 TARCST       -.001 TARCST 1    -.001 TARCST 3
(       .00038)    (       .00036)   (       .00036)
```

R² = .3646628 σ =   2.3398174 F(13, 97) =   4.28 [.0000] DW = 2.173
RSS =   531.0503054067   for 14 Variables and 111 Observations
Information Criteria: SC =   2.16; HQ =   1.96; FPE =   6.17
R² Relative to DIFFERENCE+SEASONALS =   .69619

```
Mean =         4.963964   S.D. =       2.756572    σ  =      2.3398174
Chow   F[ 0.,   0.] =              .00  Normality Chi²(2)   =         2.74
AR 1- 2F[ 2.,  95.] =              .50  ARCH 1 F[ 1.,  95.] =          .30
Xi²    F[23.,  73.] =              .81  RESET  F[ 1.,  96.] =         1.47
```

EQ(8) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts
```
         RSUCCESS =      3.443            -1.100 BLKNIGHT   -1.174 COOP
SE            (       .88672)      (       .58835)    (       .58024)
+   1.306 DSTRES         -.380 COST   1+    .842 COST    2    -.039 LENGTH 2
(       .56441)    (       .29887)   (       .29804)    (       .02754)
+     .061 LENGTH 4+     .037 PERCENTM+   .001 TARCST      -.001 TARCST 1
(       .02651)    (       .01050)   (       .00038)    (       .00036)
       -.001 TARCST 3
(       .00036)
```

R² = .3439764 σ =   2.3534655 F(11, 99) =   4.72 [.0000] DW = 2.169
RSS =   548.3411641640   for 12 Variables and 111 Observations
Information Criteria: SC =   2.11; HQ =   1.93; FPE =   6.14
R² Relative to DIFFERENCE+SEASONALS =   .68630

```
Mean =         4.963964   S.D. =       2.756572    σ  =      2.3534655
Chow   F[ 0.,   0.] =              .00  Normality Chi²(2)   =         1.80
AR 1- 2F[ 2.,  97.] =              .63  ARCH 1 F[ 1.,  97.] =          .02
Xi²    F[19.,  79.] =              .61  RESET  F[ 1.,  98.] =         1.83
```

EQ(9) Modelling RSUCCESS by OLS
The Sample is   5 to   115 less   0 Forecasts
```
         RSUCCESS =      2.601            -1.238 BLKNIGHT   -.921 COOP
HCSE          (       .66745)      (       .57653)    (       .56405)
+   1.463 DSTRES    +     .778 COST   2+    .062 LENGTH 4-   .035 PERCENTM
(       .53175)    (       .30607)   (       .02539)    (       .00997)
```

```
+      .001 TARCST        -.001 TARCST 1        -.001 TARCST 3
[      .00016]      [      .00030]      [      .00017]
```

R² = .3201353 σ =   2.3720086 F(9,101) =   5.28 [.0000] DW = 2.130
RSS =   568.2689094206   for 10 Variables and 111 Observations
Information Criteria: SC =   2.06; HQ =   1.91; FPE =   6.13
R² Relative to DIFFERENCE+SEASONALS =   .67490


```
Mean =        4.963964   S.D. =      2.756572      σ  =      2.3720086
Chow   F[ 0.,   0.] =            .00  Normality Chi²(2)   =           2.66
AR 1- 2F[ 2.,  99.] =            .55  ARCH 1 F[ 1.,  99.] =            .02
Xi²    F[15.,  85.] =            .60  RESET  F[ 1.,100.] =            1.26
```


EQ(10) Modelling RSUCCESS by OLS
The Sample is   5 to 115 less   0 Forecasts
```
         RSUCCESS =      2.314               -1.428 BLKNIGHT      -.755 COOP
SE              (      .69370)      (      .58434)      (      .56724)
+    1.434 DSTRES   +      .810 COST   2+      .064 LENGTH 4+      .035 PERCENTM
(      .56945)      (      .29773)      (      .02664)      (      .01048)
+      .001 TARCST
(      .00039)
```

R² = .2876045 σ =   2.4044053 F(7,103) =   5.94 [.0000] DW = 2.159
RSS =   595.4599724654   for 8 Variables and 111 Observations
Information Criteria: SC =   2.02; HQ =   1.90; FPE =   6.20
R² Relative to DIFFERENCE+SEASONALS =   .65934


```
Mean =        4.963964   S.D. =      2.756572      σ  =      2.4044053
Chow   F[ 0.,   0.] =            .00  Normality Chi²(2)   =           2.78
AR 1- 2F[ 2.,101.] =            .60  ARCH 1 F[ 1.,101.] =            .03
Xi²    F[11.,  91.] =            .86  RESET  F[ 1.,102.] =            1.15
```


EQ(11) Modelling RSUCCESS by OLS
The Sample is   5 to 115 less   0 Forecasts
```
         RSUCCESS =      2.258               -1.669 BLKNIGHT+      1.448 DSTRES
SE              (      .69500)      (      .55771)      (      .57145)
+      .791 COST   2+      .065 LENGTH 4+      .033 PERCENTM+      .001 TARCST
(      .29845)      (      .02673)      (      .01040)      (      .00037)
```

R² = .2753667 σ =   2.4132825 F(6,104) =   6.59 [.0000] DW = 2.164
RSS =   605.6889938162   for 7 Variables and 111 Observations
Information Criteria: SC =   1.99; HQ =   1.89; FPE =   6.19
R² Relative to DIFFERENCE+SEASONALS =   .65349


```
Mean =        4.963964   S.D. =      2.756572      σ  =      2.4132825
Chow   F[ 0.,   0.] =            .00  Normality Chi²(2)   =           2.79
AR 1- 2F[ 2.,102.] =            .54  ARCH 1 F[ 1.,102.] =            .00
Xi²    F[10.,  93.] =           1.06  RESET  F[ 1.,103.] =            .80
Xi*Xj  F[25.,  78.] =           1.35
```


EQ(12) Modelling RSUCCESS by RLS
The Sample is   5 to 115 less   0 Forecasts
```
         RSUCCESS =      2.258               -1.669 BLKNIGHT+      1.448 DSTRES
SE              (      .69500)      (      .55771)      (      .57145)
+      .791 COST   2+      .065 LENGTH 4+      .033 PERCENTM+      .001 TARCST
(      .29845)      (      .02673)      (      .01040)      (      .00037)
```

R² = .2753667 σ =   2.4132825 F(6,104) =   6.59 [.0000] DW = 2.164
RSS =   605.6889938162   for 7 Variables and 111 Observations
Information Criteria: SC =   1.99; HQ =   1.89; FPE =   6.19
t(82) for a Zero Sample Innovation Mean =   -1.09
R² Relative to DIFFERENCE+SEASONALS =   .65349


```
Mean =        4.963964   S.D. =      2.756572      σ  =      2.4132825
Chow   F[ 0.,   0.] =            .00  Normality Chi²(2)   =           2.79
AR 1- 2F[ 2.,102.] =            .54  ARCH 1 F[ 1.,102.] =            .00
Xi²    F[10.,  93.] =           1.06
```

Econometric Modelling Session Finished at
11:39: 9 on 31st July   1992

APPENDIX B

Figure 5.1: Scaled Residuals
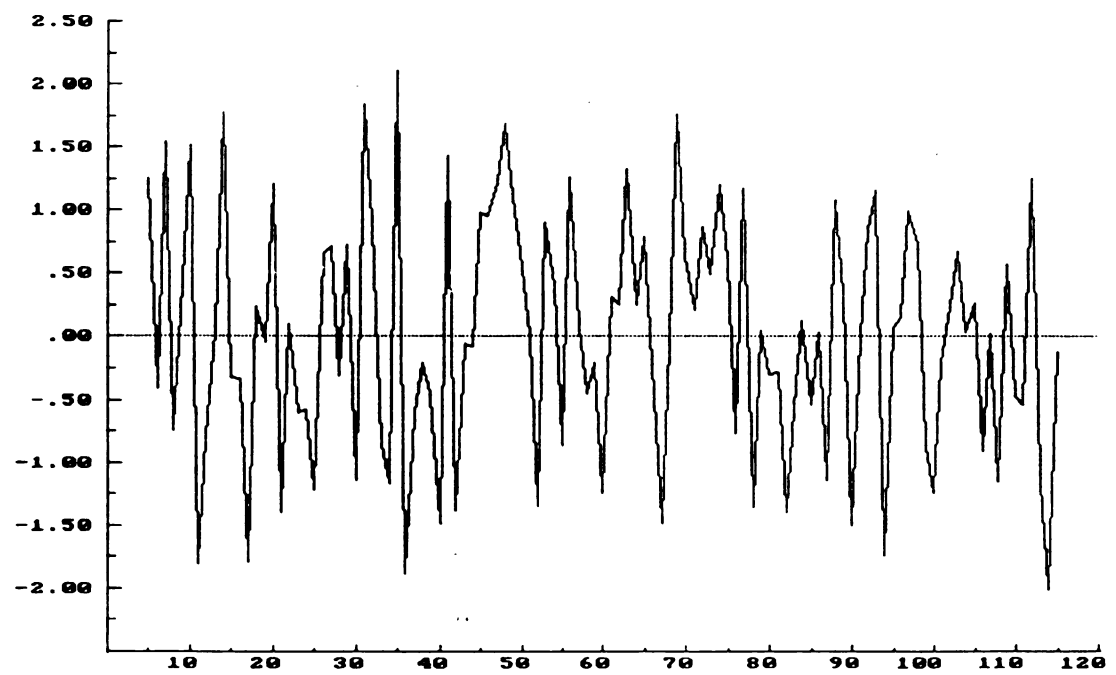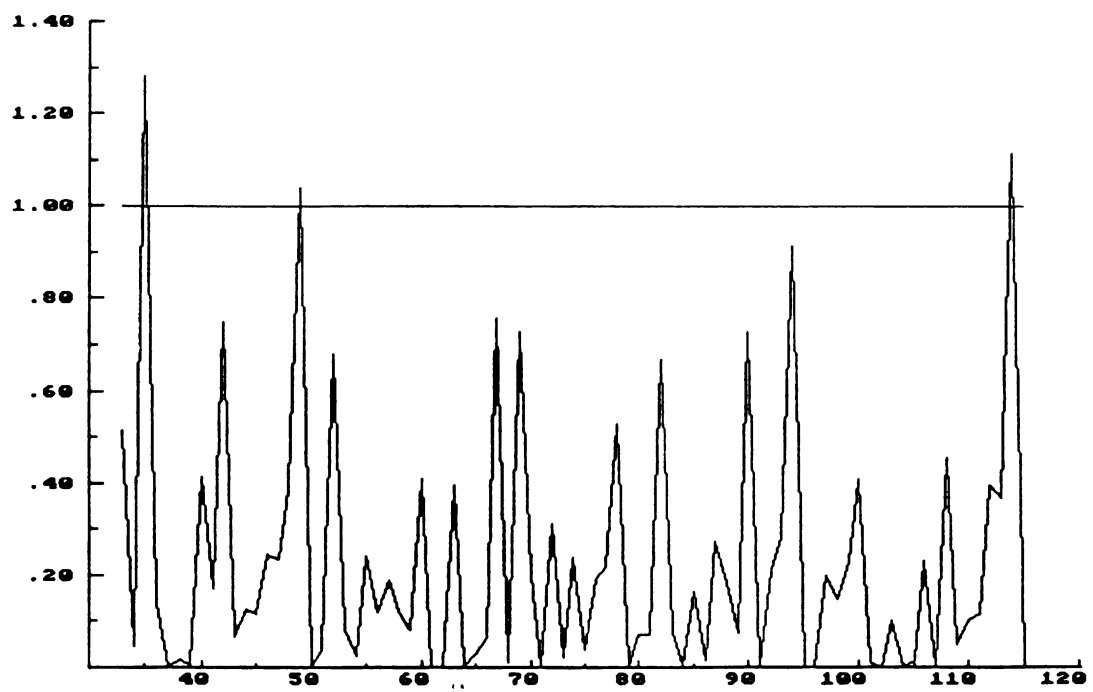
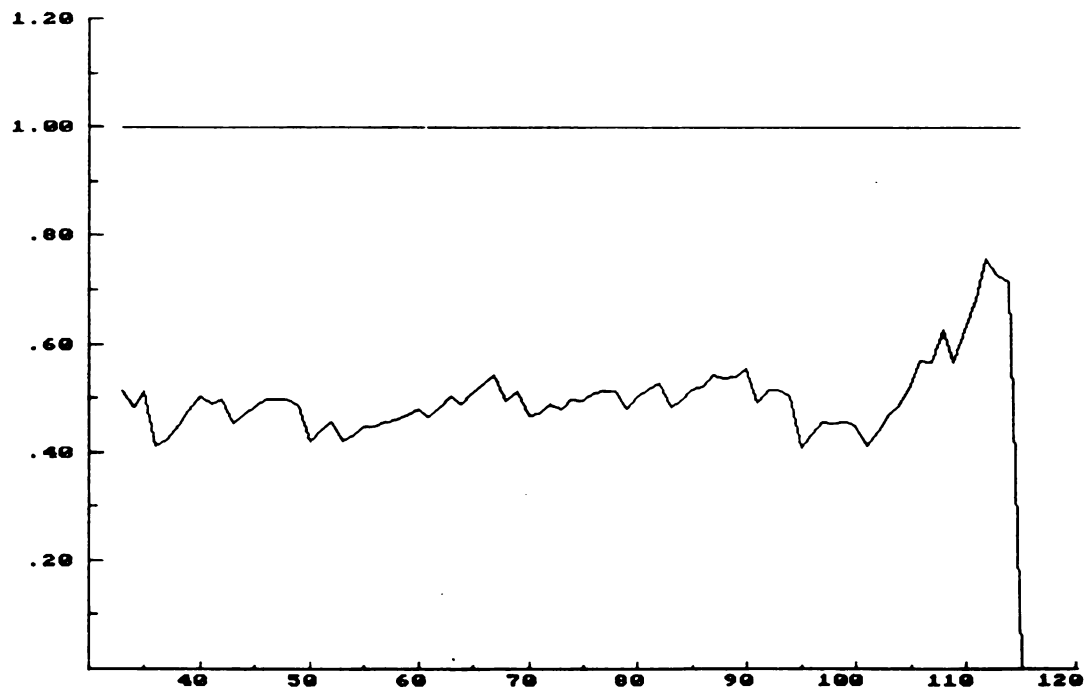Figure 5.2: One Step Chow

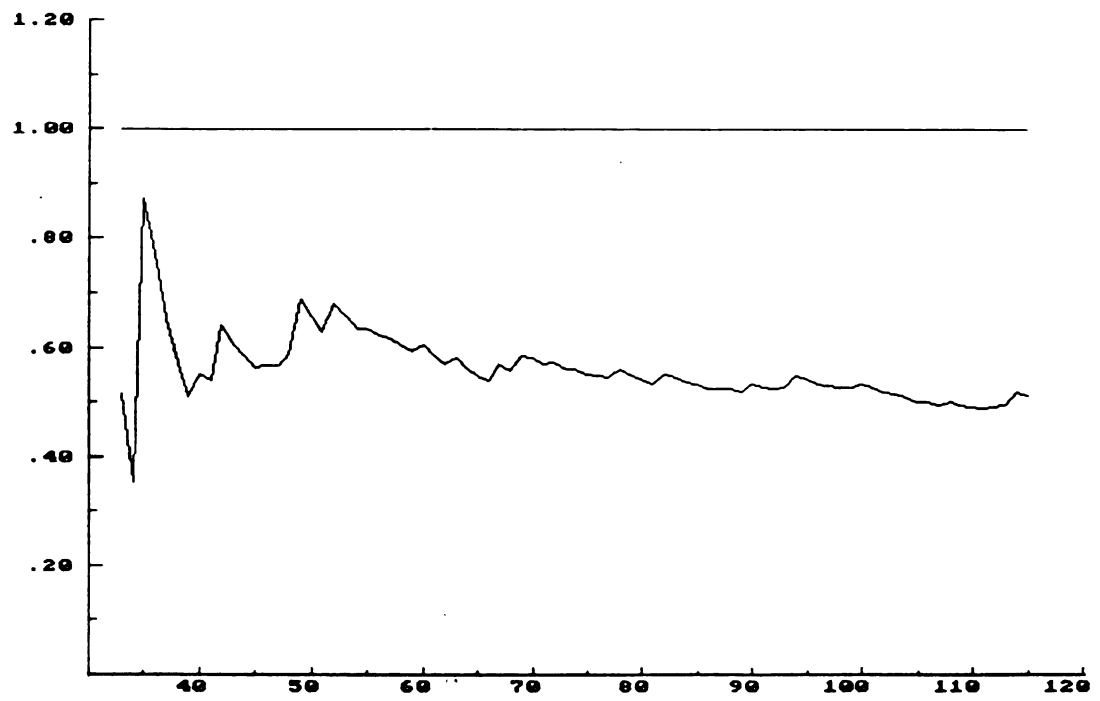Figure 5.3: Decreasing Horizon

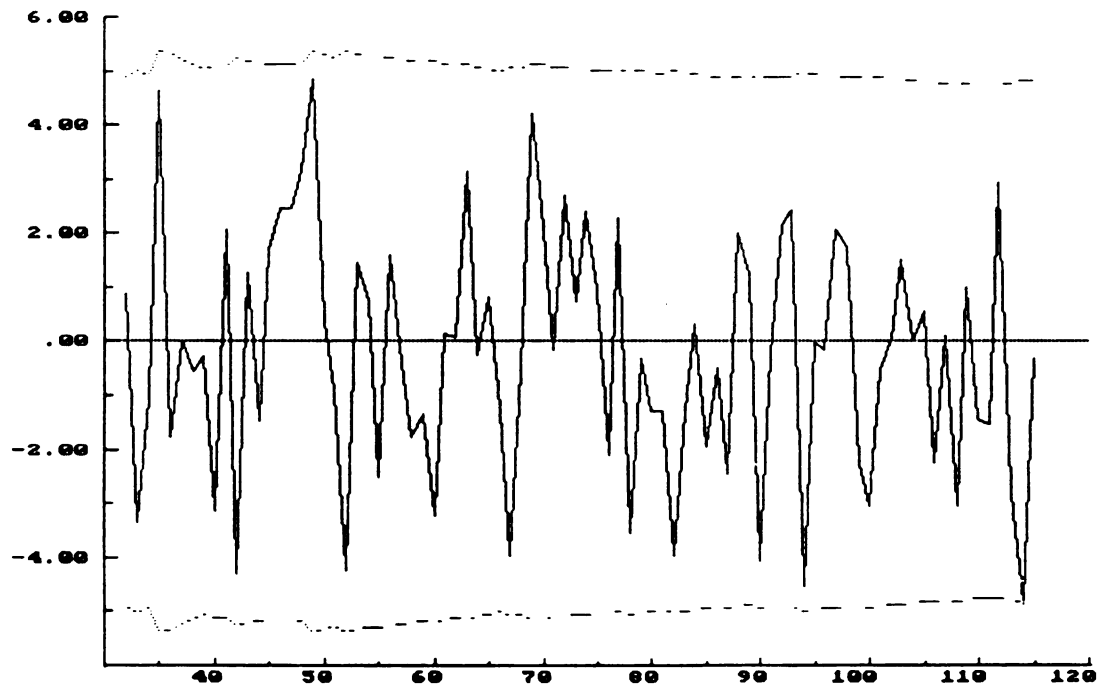Figure 5.4: Increasing Horizon

Figure 5.5

BIBLIOGRAPHY

Bibliography

Achen, Christopher H. Interpreting and Using Regression, 1989, Newbury Park: Sage Publications.

Amato, Timothy and Jim Granato *Formulating and Testing Macro Political Models in the Lucas Critique Era* Midwest, Chicago, April 1992.

Aron, R. Peace and War: a Theory of International Relations, 1966, Garden City: Doubleday.

Baldwin, Robert E. and J. David Richardson International Trade and Finance: Readings, 1986, Boston: Little, Brown and Company.

Baldwin, David A. Economic Statecraft, 1985, Princeton: Princeton University Press.

Beck, Nathanial *Comparing Dynamic Specifications: The Case of Presidential Approval* Forthing Coming: Political Analysis, March 1991.

Daoudi, M. S., and M. S. Dajani Economic Sanctions: Ideals and Experience, 1983, London: Routledge & Kegan Paul.

Dixit, Avinash and Albert S. Kyle *The Use of Promotion and Subsidies for Entry Promotion and Deterrence* The American Economic Review, v. 75 no. 1, March 1985, pp. 139-152.

Doxey, Margaret P. International Sanctions in Contemporary Perspective, 1987, London: Macmillan Press Ltd.

Doxey, Margaret P., Economic Sanctions and International Enforcement, 1971, London: Oxford University Press.

Dufour, Jean-Marie *Recursive Stability Analysis of Linear Regression Relationships* Journal of Econometrics v. 19, 1982, pp. 31-76.

Engle, Robert and David Hendry *Testing Super Exogeneity and Invariance in Regression Models* Applied Economics Discussion Paper no. 100, University of Oxford, 1990.

Engle, Robert F. and C. W. J. Granger *Co-Intigration and Error Correction: Representation, Estimation and Testing* Econometrica, v. 55, no. 2, March 1987.

Engle, Richard, David Hendry and Jean-Francois Richard *Exogeneity* Econometrica, v. 51, 1983, pp. 277-304.

Engle, Robert *Autoregressive Conditional Heteroskedasticity with Estimates of the variance of United Kingdom Inflation* Econometrica, v. 50, no. 4, July 1982.

Freeman, John R. *Granger Causality and the Times Series Analysis of Political Relationships* pp. 328-358.

Friedman, Milton <u>Newsweek</u>, January 21 1980, p. 76.

Gilpin, Robert <u>The Political Economy of International Relations</u>, 1987, Princeton: Princeton University Press.

Granato, James *The Use of Encompassing Theory to Test Competing Models* <u>MPSA</u>, April 1991.

Granato, James *An Agenda for Econometric Model Building* <u>Political Analysis</u>, 1992, vol. 3, Ann Arbor: The University of Michigan Press.

Hall, S. G. *Maximum Likelihood Estimation of Cointigration Vectors: An Example of the Johansen Procedure* <u>Oxford Bulliten of Economics and Statistics</u>, v. 51, no. 2, 1989.

Hanushek, Eric A. and John E. Jackson <u>Statistical Methods for Social Scientists</u>, 1977, New York: Academic Press inc.; Harcourt, Brace Jovanovich.

Hendry, David F. and Adrian J. Neale *Interpreting Long-Run Equalibrium Solutions in Conventional Macro Models: A Comment* <u>The Economic Journal</u>, v. 98, September 1988.

Hendry, David F. and Jean-Francois Richard *On the Formulation of Empirical Models in Dynamic Econometrics* <u>Journal of Econometrics</u>, 1982, pp. 3-33.

Hendry, David and Mary Morgan *A Re-Analysis of Confluence Analysis* <u>Oxford Economic Papers</u>, v. 41, 1989.

Hufbauer, Gary Clyde Jeffrey J. Schott and Kimberly Ann Elliott <u>Economic Sanctions Reconsidered: History and Currant Policy</u>, 1990, Washington, D.C.: Institute for International Economics.

Hufbauer, Gary Clyde Jeffrey J. Schott and Kimberly Ann Elliott <u>Economic Sanctions Reconsidered: Supplemental Case Histories</u>, 1990, Washington, D.C.: Institute for International Economics.

Johansen, Soren and Katerina Juselius *Maximum Likelihood Estimation And Inference in Cointigration—With Applications to the Demand For Money* <u>Oxford Bulliten of Economics and Statistics</u>, v. 52, no. 2, 1990.

Johansen, Soren *Statistical Analysis of Cointigration Vectors* <u>Journal of Economic Dynamics and Control</u>, v. 12, 1988, pp. 231-254.

Kennedy, Peter <u>A Guide to Econometrics</u>, 1989, Second Edition, Cambridge: The MIT Press.

Keohane, Robert O. ed. <u>Neorealism and Its Critics</u>, 1986, New York: Columbia University Press

Leyton-Brown, David, ed. <u>The Utility of International Economic Sanctions</u>, 1987, London: Croom Helm.

Lindsay, James M. *Trade Sanctions as Policy Instruments: A Re-examination* <u>International Studies Quarterly</u>, June 1986, v. 30, pp. 153-173.

MacKinnon, James G. *Critical Values for Cointigration Tests* 24 January 1990.

Nincic, Miroslav and Peter Wallensteen eds. <u>Dilemmas of Economic Coercion: Sanctions in World Politics</u>, 1983, New York: Praeger.

Nossal, Kim Richard *International Sanctions as International Punishment* <u>International Organisation</u>, v. 43. no. 2 Spring 1989, pp. 301-322.

Organski, A.F.K. and Jacek Kugler <u>The War Ledger</u>, 1980, Chicago: University of Chicago Press.

Ostrom, Charles and Renee Smith *Routinizaiton and Reciprocity in U.S. Defence Expenditure Policy Making: An Analysis of Countervailing Forces*, <u>APSA</u>, Washington D.C., 1991.

Putnam, Robert D. *Diplomacy and Domestic Politics: The Logic of Two-Level Games* <u>International Organization</u>, 1988, v. 42, no. 3, pp. 427-460.

Renwick, Robin <u>Economic Sanctions</u>, 1981, Rensselaer: Hamilton Printing Company.

Rogowski, Ronald <u>Commerce and Coalitions: How Trade Affects Domestic Political Alignments</u>, 1989, Princeton: Princeton University Press.

Russell, Bertrand <u>Power: A New Social Analysis</u>, 1938, New York: W. W. Norton.

Spanos, Aris <u>Statistical Foundation of Econometric Modelling</u>, 1990, Cambridge: Cambridge University Press.