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BEAM, ROBERT DAVID
TESTING THE INTEGRATED SOCIAL SCIENCE
HYPOTHESIS: AN ECONOMIC APPROACH.
UNIVERSITY OF CINCINNATI, PH.D., 1979

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TESTING THE INTEGRATED SOCIAL SCIENCE HYPOTHESIS
AN ECONOMIC APPROACH

A thesis submitted to the
Division of Graduate Education and Research
of the University of Cincinnati

in partial fulfillment of the
requirements for the degree of

DOCTOR OF PHILOSOPHY

in the Department of Economics
of the College of Arts and Sciences

1979

by

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August 14 19 79

I hereby recommend that the thesis prepared under my supervision by Robert D. Beam
entitled "Testing The Integrated Social Science Hypothesis: An Economic Approach"

be accepted as fulfilling this part of the requirements for the degree of Doctor of Philosophy

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Acknowledgements

It has always struck me as ironic that the first page the reader runs up on in a work like this one is the last page written by its author. It would be nice if it could communicate the relief and joy that is felt as it is typed. Another who shares this joy is my "Splice Queen" wife, Heather, who, with patient grace, helped steady the tiller through the most torrential gales. Without her this page would never have been reached.

I wish to salute my dissertation committee at the University of Cincinnati: Dr. Clovis Shepherd, Professor of Sociology, who helped spawn my interest in social interaction; Dr. Donald Wellington, Professor of Economics, whose lecture notes taught me the meaning and value of theory construction; Dr. Charles Berry, Professor of Economics, whom I hold responsible for my primal enthusiasm in Economics (in particular) and college (in general); and to Dr. Alfred Kuhn, Professor of Economics and Senior Research Fellow in Psychiatry, my Chairman and Teacher, whose LOSS model holds the words of this paper in balance, my thanks is much too small a word.

I can see the shoreline on which await many family and friends who have helped to make this crossing possible: Mother "Renie", Janet and Joe, Tuffy, Amy, Nick (The Stick) Noble, Mimi (Fingers) Farr, Kim at Kinko's, Harold The Barber, and the many students at Mother Miami where I work.

The journey is ended, the water smooth and clear as we glide into port.... the beginning of a beautiful day!

TABLE OF CONTENTS

Chapter		Page
1	Test Criteria and Methodology	1
	Introduction	1
	Methodology.	4
	Test Criteria.	5
	Overview	6
2	Analytic Tools of Social System Analysis.	8
	Pre-requisite Assumptions.	8
	Main Definitions	8
3	Introduction to the Circular Flow Model	15
	Circular Flow as a Social Organization:	
	Cross-sectional Analysis.	15
	Circular Flow System: Static Model.	16
	Main Assumptions.	16
	Diagram	17
	System Notation	18
	Role Specifications for Players	23
	Reductionist-Intrasystem Analysis.	25
	Reductionist-Intersystem Analysis.	29
4	Limited-Purpose Interactions in Circular Flow Analysis.	34
	Circular Flow as a Social Organization:	
	Developmental Analysis.	34
	Main Definitions of Transaction Theory.	34
	Main Assumptions of Transaction Model	37
	Theorems of the Transaction Model	39
	Tactics and Strategy in Circular Flow	
	Transactions	42
	Limited-Purpose Interaction Model	45
	Strategic Bads: Stress and Threats.	45
	Competition.	49
	Bargaining Power and Plain Power Coalition	61
	Three Party Pressure Transaction	67
	Model of Supply and Demand	75
	Interrelated Transactions Model.	84
5	Intersystem Transactions with Foreign Economies	86
	Circular Flow Transactions with Foreign Economies.	86
	General Definitions	86
	General Assumptions	87
	Power Factors	87

(continued on following page)

	Exchange Rate Effects.	88
	Effects of Inflation	93
	Tariff Effects	95
	Export Subsidy Effects	100
	Bargaining Power in Currency Transactions.	102
	Import Quotas and Customs Procedures	107
	Complex Intersystem Interactions:	
	Cross-sectional Analysis.	107
	Overview.	108
	Main Assumptions.	109
	Main Definitions.	109
	Implications of the Pressure Model.	111
	Implications of the Pressure Model.	113
	Intersystem Interactions: Developmental Analysis	113
	A Note on Measurement and Prediction.	115
6	The Circular Flow as a Social Organization:	
	Governmental Controls.	118
	Circular Flow as a Social Organization.	118
	Main Assumptions	118
	Credit Power in Circular Flow Transactions.	120
	Tight Money: Intersystem Analysis	120
	Easy Money Policies.	120
	Fiscal Policy in Circular Flow Transactions	123
	Tax Rebates.	123
	Tax Surcharges	125
	Fiscal Spending Increase	127
	Fiscal Spending Decreases.	129
	Wage and Price Controls	131
7	Summary of Test Results and Conclusions.	134
	Selected Bibliography.	143

ILLUSTRATIONS

Diagram		Page
A	Circular Flow System	17
B-F	Circular Flow Transactions	29-32
1-5	Simple Product Market Transactions	38-41
6-12	Competitive Model.	52-58
13-15	Bargaining Power & Plain Power Coalition Models.	62-66
16+17	Three Party Pressure Model	68+70
18-21	Supply and Demand Model.	77-81
22+23	Exchange Rate Effects.	89+91
24+25	Inflation Effects.	93+94
26-29	Tariff Effects	95-99
30	Export Subsidy Effects	101
31+32	Bargaining Power in Currency Transactions.	103+104
33	Complex Interaction Model.	108
34	Wage and Price Controls.	131

CHAPTER ONE - TEST CRITERIA AND METHODOLOGY

Introduction

A good deal of interest has developed lately in the field of interdisciplinary research and teaching in the social sciences. Professional associations are being formed and interdisciplinary curricula and degree programs are being offered in many colleges and universities around the country.¹ The realization is growing that many of today's complex social problems can be viewed with deeper insight through the interdisciplinary approach. For example, is affirmative action a political, social, or economic issue? The answer, of course, is that it is all three, and more. Social events like the oil crisis, wage and price guidelines, S.A.L.T. treaties, and disputes over nuclear power can be analyzed from the perspective of each of the social science disciplines. A primary goal of interdisciplinary analysis is to promote an eclectic method of multidisciplinary inquiry.

Another eclectic approach to social analysis has been proposed by Alfred Kuhn in his work, The Logic of Social Systems.² According to Kuhn, complex social problems do not necessarily require complex analytic tools. Whereas the interdisciplinary approach seeks to apply concepts from several disciplines, Kuhn's method, better known as the

¹There is an interdisciplinary program at Miami University (Western College), a program at the University of South Florida, and one at the University of Cincinnati, to name by a few. A new association has formed called the Association for Integrative Studies. A primary goal of this organization is "to serve as an organized voice and as a national source of information on integrative and interdisciplinary approaches to the study of human experience".

²Alfred Kuhn, The Logic of Social Systems (San Francisco: Jossey-Bass Publishers, 1974).

"integrated" or "unified" approach, starts with a compact set of systems theory tools and concepts which, he maintains, can be elaborated into the configurations of the separate social science disciplines. In addition, the unified tools can be applied to simulate directly those social problems of interest to the observer-analyst. A proposed goal of the unified approach is to provide an efficient, hierarchical structure of knowledge which shows an unbroken sequence from the most general to the most specific models of social reality. All concepts and language used in the simulation, regardless of the discipline from which they are applied would ultimately be reducible to unified language and concepts.³

Professor Kuhn is not the first author to propose a comprehensive logic of social interaction. John Von Neumann and Oscar Morgenstern published in 1944 a mathematical treatise entitled The Theory of Games and Economic Behavior.⁴ Researchers in all of the social science disciplines⁵ soon realized that the mathematical tools and concepts of game theory were useful in understanding conflict resolution,

³Ibid., p. 17.

⁴John Von Neumann and Oscar Morgenstern, The Theory of Games and Economic Behavior, (Princeton: Princeton University Press, 1944).

⁵The reader is referred to the following texts for information concerning the application of game theory to social science issues: Lester G. Telser, Competition, Collusion and Game Theory, Aldine treatises in Modern Economics (Chicago: Aldine Atherton, Inc., 1972; Martin Shubik, Games for Society, Business, and War (New York: Elsevier, 1975); R. Duncan Luce and Howard Raiffa, Games and Decisions (New York: John Wiley and Sons, Inc., 1958); Jeffrey Z. Rubin and Bert R. Brown, The Social Psychology of Bargaining and Negotiation (New York: Academic Press, Inc., 1975).

irrespective of the social framework in which conflict occurred. The popularity of game theory as a tool of research is due primarily to the generality and deductive precision of its conceptual set.

Professor Kuhn's logic of social systems (LOSS) model is not mathematical, but, like game theory, it is highly deductive in its approach, and relies on a conceptual set of general principles of social interaction that are abstracted from time, place, and the immediate parties involved. Kenneth Boulding has described the LOSS model as "a landmark and a watershed, after which one hopes the social sciences will never be quite the same again".⁶ He describes its contribution to interdisciplinary thinking as "a trumpet whose ... sound will make the disciplinary walls unstable, and these walls will at the least develop breaches through which traffic can pass."⁷

I have taken the liberty of identifying as "the integrated social science hypothesis", Professor Kuhn's assertion that the LOSS model can unify all of the separate social science disciplines into a common body of social system principles and concepts. Such a hypothesis will remain untested until specialists apply the model to problems in their fields of interest.

My purpose in writing this dissertation is to see if it is possible to incorporate into the LOSS model, some of the principal analytic tools of microeconomic, macroeconomic, and international trade theory.

⁶Kuhn, The Logic of Social Systems, p. xi.

⁷Ibid., p. xi.

The procedure adopted in this paper is to investigate, via the method of simulation, whether or not extant analytic tools in economics have their logical counterparts in the LOSS model, and, if so, whether or not it would be worthwhile for economists to be aware of the connection.

The simulation model developed in this paper is a first-level application of the LOSS model in the field of economics. Evidence that such a simulation is possible will lend empirical support to the integrated social science hypothesis, but a good deal more testing is needed before any decision about its non-rejection is meaningful.

Test Methodology

We shall state the hypothesis to be tested in this paper as follows: If the LOSS model tools can be applied in the discipline of economics, then it should be possible to redescribe the economic system entirely with the LOSS model's general purpose tools and concepts. The simulation model constructed in this paper is therefore limited to the most general (and most basic) social system within the scope of economics - that of the circular flow of income, goods, and services.⁸ All other economic interactions are but specialized configurations of the concepts employed in this general model.

The method of simulation used in this paper to analyze circular flow interactions is primarily deductive. Basic definitions of primary analytic concepts are presented, after which specific assumptions are

⁸An in-depth analysis of the circular flow as a strict macroeconomic system is provided by John M. Keynes, The General Theory of Employment, Interest, and Money (New York: Harcourt, Brace and World, Inc., 1936).

made explicit which list the boundaries of an interaction, the type of interaction including the types of goods exchanged, and the time duration (whether the analysis is cross-sectional or developmental). The simulation model we present is the LOSS model's equivalent of the circular flow system. Our interest, however, is not focused on the behavior (changes in price and quantity) of commodities as much as it is focused on the behavior of the parties who exchange these commodities. It is in this regard that this paper is intended to add to the coverage of economic analysis. Other than in this respect, the paper merely redescribes it.

Test Criteria

Whether extant economic tools can be redescribed with LOSS model concepts, or whether a simulation model of the neoclassical economic system can be constructed are questions which must be answered within certain standards of acceptability. These analytic rules are the following:

Criterion 1

The simulation model must describe the selected economic system in terms of its component subsystems and the interactions between them. This description must be accomplished by:

- a) describing the economic system as a unique pattern of social organization.
- b) describing the structure of this organization in terms of the subsystems it includes, their role traits, their goals, and the nature of their interactions as they pursue these goals.

Criterion 2

The simulation must describe the economic system and the interactions of its subsystems at different levels of system analysis on both the cross-sectional and developmental axes.

Criterion 3

All concepts and language in the simulation must consist of or be reducible to the most general LOSS model tools and concepts.

Criterion 4

The connections among the parts of the simulation model must parallel the connection among parts of the real system it is designed to represent (nomothetic vs. idiographic).

Criterion 5

The simulation must demonstrate the correspondence of analytic concepts between the LOSS model and conventional economic theory when both are applied to particular types of problems. Conclusions reached by applying the principles of one paradigm must not contradict conclusions reached by applying the principles of the other.

The analysis presented in this paper must adhere to the above criteria if our test results are to allow us to make any meaningful inferences about confirmation of the integrated social science hypothesis.

Dissertation Overview

This chapter has provided an introduction to the general purpose and test methodology of the dissertation. Chapter Two presents the general purpose LOSS model tools from which our simulation model is to be constructed, and briefly reviews the manner in which these tools are used. Chapter Three begins construction by listing the boundaries of the simulation, and by specifying the role traits and interactions of all component subsystems. Some "limited-purpose" interaction models are developed in chapter four which enable the analyst to engage in nomothetic cross-sectional and developmental analysis of circular flow interactions at both the intersystem (chapter 5) and intrasystem (chapter 6) levels. Chapter seven concludes the dissertation with a

a summary discussion of the value of our test results to the fields of economic theory, game theory, and integrative studies.

CHAPTER TWO - ANALYTIC TOOLS OF SOCIAL SYSTEM ANALYSIS

Introduction

This chapter lays out the primary analytic tools we shall use to construct our simulation model of the circular flow system. Most of these tools (definitions 1 - 23) are taken directly from the LOSS model, while others (definitions 24 - 26) are well established tools of economic reasoning. We shall assume as we construct our model that the reader is familiar with the LOSS model concepts of decision, transaction, and organization theory. We also assume the reader understands the basics of control system theory, game theory, and the basics of economic theory. The definitions which follow will make explicit the meanings of the major concepts and analytic tools employed in this paper:

Main Definitions¹

1. A player is the term for the basic unit of social analysis in this test model. A player is a social man² and behaves as a controlled acting system.
2. A controlled acting system is a system whose interrelated component subsystems effectuate goal-oriented behavior. Goal-oriented behavior between players can be analyzed at the intrasystem level or at the intersystem level of analysis.

¹A more complete definition of the terms presented here can be found in Kuhn, The Logic of Social Systems, pp. 483-509.

²The model of Social Man is a broader and a more fruitful analytic tool than the model of Economic Man. A summary of the model of Social Man is provided by Kuhn, p.102.

3. The intrasystem level of analysis is concerned with the process of decision-making within acting systems. It concerns the way in which the system's detector (informational), selector (motivational), and effector (effectuating) subsystems interact to produce a behavioral response.
4. The intersystem level of analysis is concerned with interactions between acting systems, namely, their communications, their transactions, and their organizations.
5. Communications between players involve the transfer of coded information. They are predominately sign-based or semantic and represent an interaction of the players' detector subsystems.
6. Transactions between players involve the transfer of valued things. The terms on which transactions occur result from the interaction of the players' selector subsystems.
7. Organizations between players involve the overall process and effect of their interaction. Organizations can be classified at the intrasystem level of analysis as formal, informal or semiformal.
8. A formal organization of players is itself viewed as a controlled acting system. It is a consciously coordinated attempt to effectuate a joint goal. It contains identifiable detector, selector and effector subsystems whose intrasystem interactions effectuate goal-oriented behavior for the organization as a unit. Interactions between formal organizations are analyzed with respect to their communications, their transactions, or the way in which they consciously coordinate their organizational outputs to jointly effectuate their goals.

9. An informal organization of players has no identifiable detector, selector, or effector subsystems that effectuate behavior for the system as a whole. It is an uncontrolled interaction of player subsystems.

10. A semiformal organization has, contained within its pattern, elements of both formal and informal organization. It is informal in that it does not interact as a unit, but formal in the sense that some of its subsystem players attempt to modify the system states of other players in ways that are considered best for the organization as a whole.

11. The structure of any organization of player subsystems is described by listing the component subsystems, their role traits, and the nature and time duration of their interactions. Intrasystem analysis deals with the way an organization behaves as a unit, while intersystem analysis is used to describe the interactions of its parts and its own interactions as a unit with other organizations.

12. Nomothetic analysis abstracts from time and place those elements which are common to diverse types of interactions. It concerns itself with general and universal principles of social system analysis.

13. Idiographic Analysis focuses on the uniqueness of an interaction. By emphasizing the details of a particular interaction, idiographic analysis is in direct contrast to nomothetic analysis in this model.

When we wish to investigate an interaction at either the nomothetic or the idiographic level, we employ the intrasystem and the intersystem analytic tools. Cross-sectional or developmental analysis applies to both.

14. Cross-sectional analysis deals with interactions between players, given the system states of each. It is essentially static and lies in contrast to developmental analysis.
15. Developmental analysis deals with interactions between systems as their system states change over time. The model's deductive characteristics are derived from the analytic freedom it affords the investigator on both the cross-sectional and developmental axes. Both types of analysis can be applied at different levels of system hierarchies. On the cross-sectional plane we can view a particular system from three different levels, the reductionist, the holistic, and the functionalist perspectives.
16. Cross-sectional analysis at the functionalist level examines the static role that a given system plays in some larger supersystem.
17. Cross-sectional analysis at the holistic level examines a given system as a functioning unit.
18. Cross-sectional analysis at the reductionist level examines the subsystems of which a given system is composed.

An interaction's dynamic processes are modeled using developmental analysis under circumstances of emergence, continuance, or decay.

19. Developmental analysis at the emergent level examines the development of a higher-order system by the newly coordinated interactions of systems, or by examining the increased differentiation occurring within an existing system.
20. Developmental analysis that examines the break-down of higher level systems into their lower-level components is called decay.

Developmental analysis that involves neither emergence nor decay deals with simple continuance or equilibrium.

The controlled system and the uncontrolled system, the intra-system and intersystem views; the cross-sectional and the developmental with the straight, upward and downward view in each; and the nomothetic vs. the idiographic approaches comprise the tool kit with which the simulated economic system must be built. The analytic concepts and their configurations which these tools help construct consist of the intrasystem process of decision-making and the intersystem processes of communication, transaction and organization between players. The conceptual set for intrasystem (psychological) analysis is logically connected with and parallel to intersystem (social) analysis.

21. A simulation model is a single-purpose analytic tool employed by the observer-analyst to describe a particular type of situation. The analyst's task is to abstract from any real social problem comprehensible configurations of communications, transactions, and organizations between participants, and to group these configurations in ways that constitute a good description of reality. At different points in our simulation model we shall switch from holistic to reductionist to functionalist levels of analysis depending upon whether we are interested in the participants' valuations of the respective goods exchanged, their system states that determine a particular decision, or their role specifications as they engage in particular kinds of organizational behavior.

22. An interaction between Parties A and B occurs whenever some change

in A's system states, through a movement of information (communication) or matter-energy (transaction) induces a change in the system states of B, or the reverse. A fundamental LOSS model principle is that the analytic boundaries of any interaction, no matter how complex, are determined by the interests of the investigator.³

23. A party is defined in this simulation model as a player, collectivity of players, or a formal organization of players, that engages in an interaction as a unit. All players who engage in transactions with other players are considered as parties when viewed at the intersystem level.

24. The method of aggregation, as developed by John Maynard Keynes, is used here to simplify the complex realities of our economic system, and to conceptualize it as an abstract analytic circular flow system.

25. The technique of partial equilibrium analysis, as developed by Alfred Marshall, is used to investigate changes in power and bargaining power that result from changing certain variables while holding others constant. This is the purpose for our frequent use of the "ceteris paribus" assumption in chapters four, five, and six.

26. The technique of marginal analysis is used when it is assumed that players seek to maximize certain magnitudes (profits, utility, etc.) within constraints, only some of which are under their control. The principles of decision theory employed in this paper have been derived (by Kuhn)⁴ from the economic theory of the firm which has relied heavily on the technique of marginal analysis.

³Ibid., p.25

⁴Ibid., p.104

The next chapter will make use of the above concepts to construct a cross-sectional simulation model of the circular flow system at both the holistic and reductionist levels of analysis.

CHAPTER THREE - INTRODUCTION TO THE CIRCULAR FLOW MODEL

The Circular Flow as Social Organization: Cross-Sectional Analysis

Our circular flow model is primarily system-based, although it does include selected concepts from macroeconomics and game theory. The term system-based means that the analysis of the interaction of the system's component subsystems is limited to their communications, their transactions, and the various ways they organize to effectuate joint behavior. The system is viewed as a macroeconomic system because it models the circular flow of goods and services in the product, factor, and credit markets of a representative mixed-market,¹ free-enterprise economic system. It is game-theoretic because it presumes that the individual participants in this economic system act as players who make strategically calculated "moves" in a competitive contest to complete scarce circular flow transactions with other players or formal organizations of players.

The model requires the observer-analyst to make a distinction between the various levels of analysis when describing the interactions between players in the circular flow system. When players act as parties to an organization, the functionalist and emergent levels of intrasystem analysis will be used to describe the organization's behavior as a unit. When players, or their organizations interact as separate units, the interaction is described with intersystem tools at the reductionist or holistic level. The circular flow system as an

¹A mixed-market economy includes both a private and a public (government) sector.

acting system of interacting subsystems will be described at the holistic level. Decided behavior of a player, party of players, or a formal organization of players will be analyzed with intrasystem tools on either the cross-sectional or the developmental axis.

The Circular Flow System: Static Model

A description of the circular flow system as a social organization is accomplished by specifying its pattern in terms of its subsystem players and the roles they occupy in the organization. A diagram of the circular flow model, its symbol notation and elemental definitions are presented on pages 17 to 20. In order to delineate its basic structure, we will use a simplified pure static model prefaced by the following assumptions.

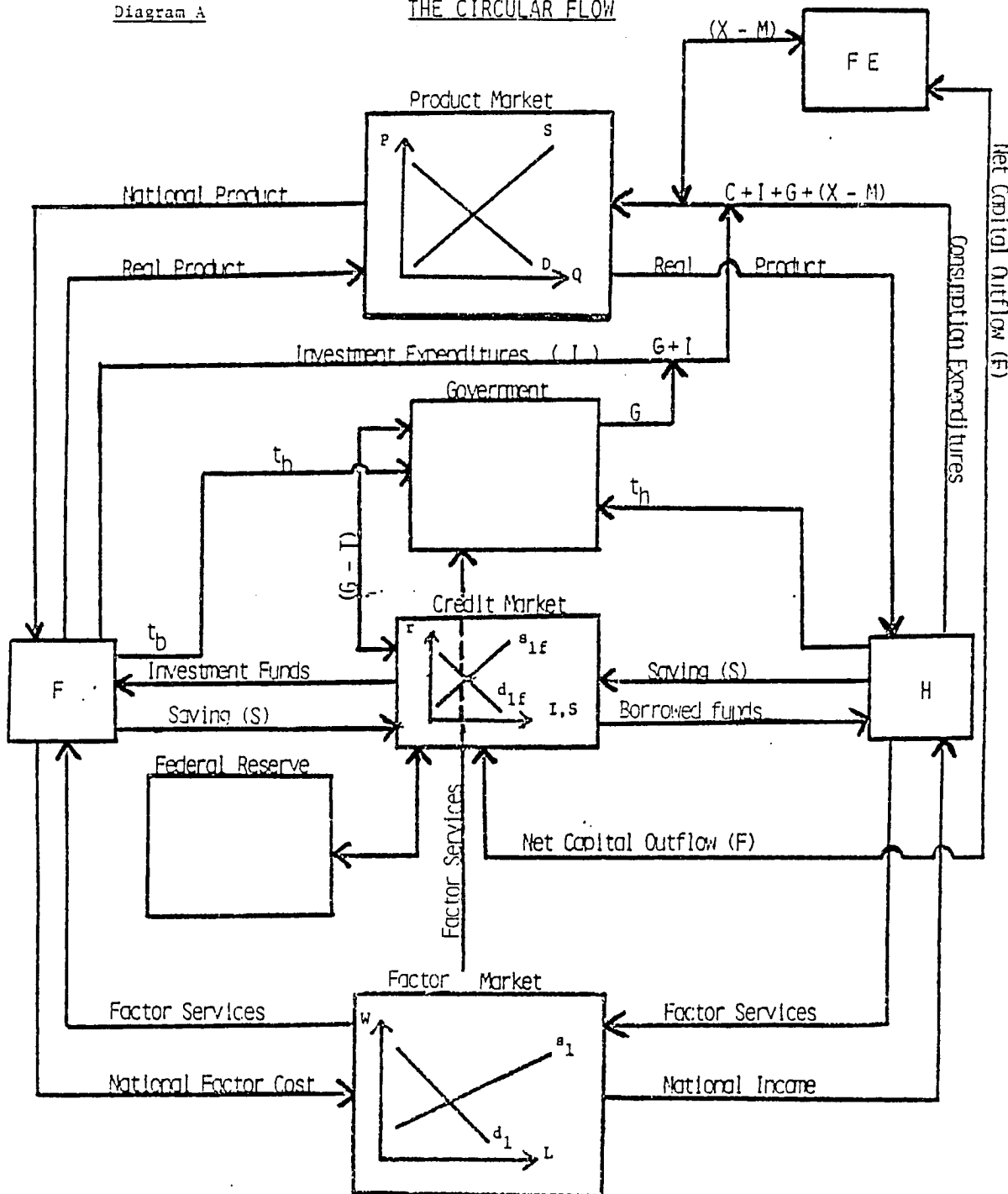
Main Assumptions

- 1.0 The following assumptions apply at the holistic-intrasystem level.
 - 1.1 The circular flow system as a social organization is modeled as an acting system of interacting subsystems. It is controlled at the holistic level by the government and the Federal Reserve which seek to maintain particular main system variables (the rate of inflation, the unemployment rate, etc.) within specified ranges. The circular flow is largely uncontrolled at the reductionist level as most of its subsystem variables (the prices and quantities sold of particular goods and services) are determined in free market interactions. As an organization, the circular flow does not make decisions as a unit, and does not determine its own structure.
 - 1.2 The Federal Reserve is assumed an effective countercyclical regulator of the system's supply of credit at the reductionist-intersystem level.

(this section is continued on page 21)

Diagram A

THE CIRCULAR FLOW



System Notation: Circular Flow²

1. C: stands for dollar consumption expenditures by households for newly produced goods and services during the accounting period
2. I: stands for dollar investment expenditures by firms for new plant and equipment during the accounting period
3. H: stands for households
4. F: stands for firms
5. G: stands for government expenditures for public goods in product market transactions with firms
6. t_h : taxes paid to government by households
7. t_b : taxes paid to government by firms
8. X-M: stands for net exports from the circular flow to foreign economies (FE)
9. F_c : stands for net capital outflows
10. NFC: stands for national factor cost in payments to factors of production (land, labor, capital, entrepreneurship)
11. Federal Reserve: the formal organization that controls member banks' EP's in both loan and deposit transactions with the public
12. Government: the sovereign formal organization which allocates power and public goods throughout the system
13. Competition in this model is defined as a situation of interpersonal conflict between two or more parties (B's) who seek to complete the same transaction with A. Transactions are scarce³ when success for one B means failure for other B's in dealing with A.

²Although many patterns of the circular flow are presented in various economic texts, the diagram shown on the previous page was developed by this author.

³The use of the term "scarce" is intended to bring out the gaming qualities in the simulation, and is introduced in the spirit of Chamberlain's statement that: "There is scarcity whenever groups of workers seek to top each other in the wage gains which each makes or when businessmen (including financial institutions) seek to better each other's rate of profit." See Neil W. Chamberlain, A General Theory of Economic Process (New York: Harper and Brothers, 1955), p.75.

- 13.1 Competition occurs among firms who, as producers, seek to complete product market transactions with domestic and foreign buyers.
- 13.2 Competition occurs among households who, as consumers, seek to complete product market transactions with domestic and foreign producers.
- 13.3 Competition occurs among firms who, as employers, seek to complete factor market transactions with domestic and foreign factor suppliers.
- 13.4 Competition occurs among households who, as factor suppliers, seek to complete factor market transactions with domestic and foreign firms or government.
- 13.5 Competition occurs among financial intermediaries who, as buyers and suppliers of credit funds, seek to complete loan and deposit transactions with domestic and foreign firms, households, and government.

This concept of competition is close kin to Chamberlain's definition which is that "A competitive relationship exists when the attempted achievements of two or more individuals are incompatible with each other".⁴ It also parallels the game-theoretic notion of interest conflict between players: "An individual is in a situation from which one of several possible outcomes will result and with respect to which he has certain personal preferences. However, though he may have some control over the variables which determine the outcome, he does not have full control. Sometimes this is in the hands of several individuals, who, like him, have preferences among the possible outcomes, but who in general do not agree in their preferences".⁵

The economic usage of competition "requires that no firm be large

⁴Ibid, p. 74

⁵Luce, R. Duncan, and Raiffa, Howard, Games and Decisions (New York: John Wiley and Sons, Inc., 1958), p. 1.

enough in relation to the market to be able to affect the value of the relevant market variables to the extent that any other firm could be influenced by the effect".⁶ Market conditions which reflect consensus terms of trade are the result of adding large numbers of buyers and sellers where each of the parties in one role seeks to complete transactions with one or more parties in the other. As used in this paper, a competitive market is a particular type of informal organization among acting systems which includes, but is not limited to, the market model of pure competition.

14. The circular flow system is a mixed-market, free enterprise, neo-classical economic system.

⁶This statement appears in William Fellner, Competition Among the Few, (New York: Alfred A. Knopf, 1949), p. 41.

(continued from page 16)

2.0 The following assumptions apply at the reductionist-intrasystem level.⁷

2.1 All players and formal organizations of players are guided solely by their DSE processes. None of their system states are specified at the main system (holistic) level.

2.2 Intra-organizational decisions result from communications, transactions, and dominant coalitions among sponsors.

2.3 Decisions by players in all types of circular flow transactions are made rationally, in light of subjective expected future benefits and costs of perceived alternatives.⁸

3.0 The following assumptions apply at the reductionist-intersystem level.

3.1 The circular flow model is transaction-based and involves a number of specified interacting component subsystems. Each main transaction consists of the exchange of an economic good or service for money.

3.2 All transactions between subsystem players are selfish-indifferent transactions.

3.3 The numbers, amounts, and terms of trade in transactions between occupants of the same or different roles are a function of their interpersonal power (see definition p. 36)

3.4 The circular flow system includes subsystems that interact with component subsystems of foreign economies, namely through inter-system import, export, and capital transactions.

3.5 The circular flow system is an acting system of controlled interacting subsystem players who occupy multiple roles. All players who occupy the same role are assumed to have similar goals toward the goods exchanged. For example, all players as consumers are assumed to give as little and to receive as much as possible in their product market transactions with domestic or foreign firms.

⁷ the reductionist-intrasystem view is concerned with the process by which subsystem players or their formal organizations select effectuated behavior. The reductionist-intersystem view is concerned with the process by which subsystem players or their formal organizations engage in communications, transactions, and suborganizations, or some combination thereof.

⁸ The reader is referred to Kuhn's model of rational decision-making in The Logic of Social Systems, chapter 6, pp. 104-136.

- 3.6 A given player is assumed to be representative of the category of all players or formal organizations of players who occupy the same role. When environmental events affect the system states of all role occupants in a similar manner we shall select for analysis a "representative" player (or party) in that role.
- 4.0 The following assumptions apply at the functionalist-intrasystem level.
- 4.1 The organization of all domestic and foreign firms is predominately informal.
- 4.2 The organization of all domestic and foreign households is predominately informal.
- 4.3 The organization of all domestic and foreign financial intermediaries is predominately informal.
- 4.4 The organization of government as it interacts with governments of other circular flow systems is predominately informal.
- 5.0 As an acting system, the circular flow is analogous to an N-person game as players interact in their separate but interdependent roles, and pursue their self-interests (goals) within game rules (laws) that delineate proper from improper behavior during play.

Role Specifications for Players in the Circular Flow

A basic distinction is to be made between the concepts of role and role occupant. A role is a pattern system and a role occupant is an acting system. For example, the position of "Inflation Czar" is a role, while Alfred Kahn himself is a subsystem role occupant who effectuates behavior for the organization, as specified by his role. The following role specifications apply to the players and relevant organizations of players in our circular flow system.

- 1.0 Government is considered "the sovereign and formal organization of the whole society contained within the boundaries of the circular flow system. The government's role is to allocate power and provide public goods. As specified by the sponsor public, this role also includes the effectuation of automatic and discretionary fiscal policies which maintain particular main system variables within specified ranges.
 - 1.1 The government acts in the role of employer when it completes factor market transactions with domestic or foreign factor suppliers. It acts in the role of tax collector when it completes tax transactions with firms or households. It acts in the role of supplier of credit funds when it completes deposit transactions with domestic or foreign financial intermediaries, or loan transactions with firms or households. It acts in the role of consumer when it completes product market transactions with domestic or foreign firms.
- 2.0 Players who interact as sponsors of firms act as producers when they complete scarce product market transactions with domestic or foreign households or other firms. They act as employers as they select subsystem role occupants and resources to perform the firm's transformations. They act as taxpayers when they complete tax transactions with government. They act as consumers when they complete product market transactions with other domestic or foreign firms. They act as buyers of credit funds when they complete loan transactions with financial intermediaries. They act in the role of supplier of credit funds when they complete deposit transactions with domestic or foreign financial intermediaries.
- 3.0 Players who interact as sponsors of households act as consumers when they complete product market transactions with domestic or foreign firms. They act as factor suppliers when they complete

scarce factor market transactions with employers. They act as taxpayers when they complete tax transactions with government. They act as suppliers of credit funds when they complete deposit transactions with domestic or foreign financial intermediaries, or government. They act as buyers of credit funds when they complete scarce loan transactions with domestic or foreign financial intermediaries, or government.

- 4.0 Players who act in the role of sponsors of financial intermediaries supply credit funds to players in the system when they complete scarce loan transactions with the domestic or foreign public. Financial intermediaries act as a buyer of credit funds when they complete scarce deposit transactions with the domestic or foreign public. They act as taxpayers when they complete tax transactions with government. They act as employers when they complete scarce factor market transactions with domestic or foreign factor suppliers. They act as consumers when they complete product market transactions with domestic or foreign firms.
- 5.0 Players who act in the role of sponsors of the Federal Reserve seek to maintain selected main system variables within specified ranges by controlling the supply of credit. Monetary controls at the main system level provide government with a countercyclical regulator of circular flow transactions. The Fed has authority over the credit policies of member commercial banks, and can selectively manipulate member bank EP's in loan and deposit transactions with domestic and foreign firms and households.
- 5.1 The Fed acts as employer when it completes scarce factor market transactions with domestic or foreign factor suppliers. It acts as both supplier and buyer of credit funds when it completes open market and discount loan transactions with domestic or foreign financial intermediaries.

Additional roles and assumptions can be added to this model, but their content depends on the investigator's specialized interest in a particular interaction. At any rate, the above assumptions and role specifications are antecedent premises needed to support the conclusions drawn in this paper.

Reductionist-Intrasystem Analysis: The Logic of Rational Decision-Making

In addition to statements made about the subsystem players and their role specifications in the organization, it is also necessary to describe their behavior at the intrasystem and intersystem levels. All behavior of the players, as controlled acting systems, results from the interaction of their respective detector, selector, and effector subsystems in which the detector and effector define the opportunity function of alternative responses, and the selector defines the preference function by which these alternatives are ordered (ordinally) in value. Behavioral outputs result from DSE interactions. Since the individuals who make decisions are goal-oriented, the following section makes explicit the goals of the players and the nature of their decisions as they select behavioral outputs. Throughout, the technique of marginal analysis is employed to demonstrate the correspondence between the LOSS model tool of decision-making and the conventional consumption, production, and utilization decisions included within microeconomic theory.

- 1.0 The goal of players as consumers is to maximize utility from the consumption of economic goods and services (including saving) subject to a limited money income constraint.
 - 1.1 The consumer's preference function for goods establishes a rank ordering among all available budgets and represents the rate at which he is willing to substitute one good for another in his consumption pattern.
 - 1.2 The consumer's opportunity function of goods is established by his fixed money income and relative prices. Known in economic theory as the consumer's "budget space", this opportunity function is the locus of alternative budgets he is able to substitute in his consumption pattern with a fixed money income and fixed relative prices.

- 1.3 A rational decision is the selection of the most preferred budget which is the one for which the ratio of marginal utilities of the included goods is equal to the ratio of their prices. This is the only budget combination whose final net benefit is positive.
- 2.0 Players in the role of factor suppliers must decide the optimal allocation of their limited time between work (income) and leisure.
- 2.1 The factor supplier's preference function establishes a rank ordering in value of all income-leisure combinations, and represents the rate at which he is willing to substitute units of income for units of leisure.
- 2.2 The factor supplier's opportunity function of alternative available combinations is established by the limited number of hours in the day and (assuming the discussion concerns inputs of labor units) the wage rate per hour (day) of labor inputs.
- 2.3 A rational decision is the selection of the most preferred combination of labor and leisure which is the combination at which his marginal rate of substitution of income for leisure equals the wage rate. This is the only combination whose final net benefit is positive.
- 3.0 The goal of sponsors of firms as producers is to achieve a maximum of output at minimum cost in the transformation process. A decision must be effected about the optimal (most preferred) combination of capital and labor inputs subject to a fixed expenditures constraint and fixed input prices.
- 3.1 The producer's preference function establishes a rank order of all capital-labor combinations as specified by the production function. This production function determines the rate at which he is willing to substitute capital for labor inputs in the production process.
- 3.2 The producer's opportunity function of alternative capital-labor combinations is established by his fixed expenditures constraint and the fixed prices of inputs. The opportunity function specifies the rate at which he is able to substitute inputs of capital for labor.
- 3.3 A rational decision is the selection of the most preferred combination at which the marginal rate of technical substitution of capital for labor equals the ratio of their market prices. This is the only combination at which the final net benefit of substituting additional units of labor for additional units of capital will be positive.

- 4.0 The goal of sponsors of firms as suppliers of final goods and services is to maximize profit. A decision must be effected about the optimal level of output supplied and the optimal price per unit.
- 4.1 The firm's preference function establishes a rank order of all price-output combinations with respect to the net benefit (profit) of each.
- 4.2 The firm's opportunity function establishes the range of alternative price-output combinations considered feasible within a fixed scale of plant, fixed resources prices, and a given level of technology.
- 4.3 A rational decision is the selection of the most preferred price-output combination as the one at which marginal cost equals marginal revenue. This price-output combination is the only alternative which maximizes profits and for which the final net benefit is positive.
- **With the appropriate substitution of concepts, 4.1-4.3 can also apply to the making of rational decisions by sponsors of financial intermediaries as they seek to maximize profits from the optimal allocation of credit funds.
- 5.0 The goal of sponsors of firms as employers is to minimize cost and maximize profit from the combination of variable factor services it employs. A decision must be effected about the optimal number of variable inputs (labor) to employ subject to a fixed expenditures constraint, a fixed scale of plant and technology, and a fixed level of final product demand.
- 5.1 The employer's preference function establishes a rank order of all wage-input combinations with respect to the net benefit of each. The net benefit is determined by the difference between a given input's marginal revenue product and its marginal resource cost.
- 5.2 The employer's opportunity function of alternative wage-input combinations is established by its scale of plant, its given expenditure constraint, the level of technology, and the level of final product demand.
- 5.3 A rational decision is the selection of the most preferred wage-input combination as the one at which the marginal revenue product of an additional input equals its marginal resource cost in terms of the wage rate. This is the only combination at which the final net benefit of employing additional labor inputs will be positive.

6.0 The goal of sponsors of firms as buyers of credit funds is to achieve a maximum of net benefit from the funds acquired in loan transactions with financial intermediaries. A decision must be effected about the optimal amount of investment funds to borrow.

6.1 The firm's preference function of alternative amounts of credit funds establishes a rank ordering according to the marginal efficiency of investment criterion (although there are others).

6.2 The firm's opportunity function of alternative amounts of credit funds considered feasible is established by its scale of plant and the number and types of alternative investment projects under consideration.

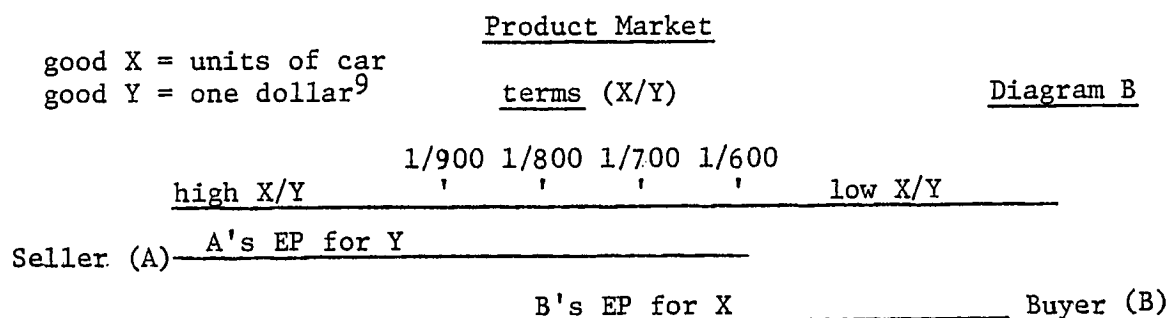
6.3 A rational decision is the selection of the most preferred amount of credit funds as the level at which the interest cost of financing an additional investment project equals the project's rate of return to the firm's sponsors.

More specialized approaches to the process by which decisions are made in sections 1.0-6.0 may involve more detail in the specification of opportunity and preference functions, but the logic of the decision process itself still remains as the selection (consistent with the system's goals) of the most preferred alternative within an opportunity function.

Reductionist-Intersystem Analysis: The Logic of Transactions

In addition to the goal and role specifications which describe the intrasystem decision processes of our players at a fixed point in time, it is also necessary to state the nature of their exchange behavior at the intersystem level. Whereas behavior at the intrasystem level can be viewed with the LOSS decision model, the behavior of players at the intersystem level is analyzed with the LOSS tools of transaction and organization theory. This section briefly describes a cross-sectional view of each type of circular flow transaction. A more detailed discussion of the power and bargaining power forces that mold the terms of trade is presented in the next chapter.

1. Product Market transactions represent exchanges between buyers and suppliers of newly produced goods and services. The terms of trade are scaled as "units per dollar" in an attempt to place a given currency unit as the "numeraire" against which all other goods will be compared. An example is provided below:

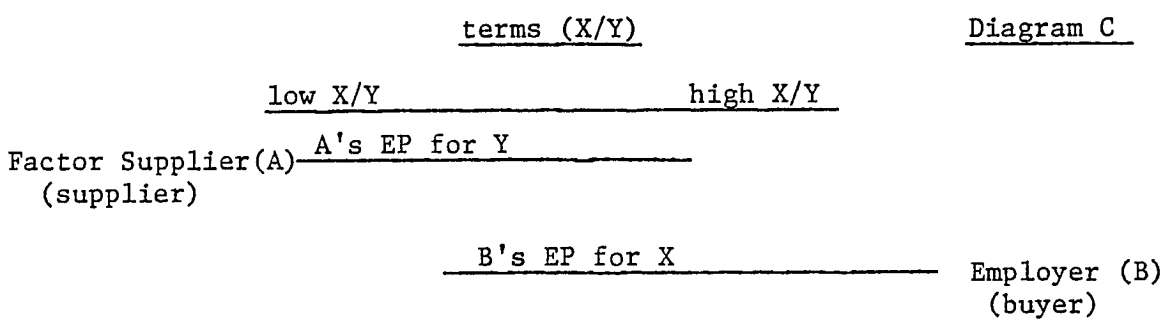


⁹ Good Y is stated as "one dollar", and the party who receives dollars (regardless of the type of transaction) is always Party A. The objective here is to achieve consistency in the denominator of the terms of trade.

2. Factor Market transactions represent exchanges between buyers and suppliers of factor resources (land, labor, capital, and enterprise). The terms of trade are scaled as "units of factor inputs per dollar." An example of a factor market transaction is provided below.

Factor Market Transaction

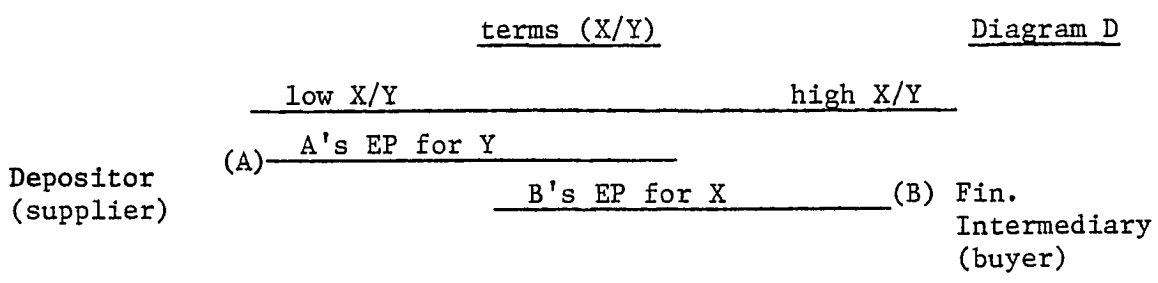
good X = units of factor input
 good Y = one dollar



3. Deposit transactions represent exchanges between financial intermediaries and domestic or foreign firms and households. The terms of trade are scaled as "dollars of deposit funds/one dollar in interest payment." An example of a deposit transaction is provided below.

Deposit Transaction

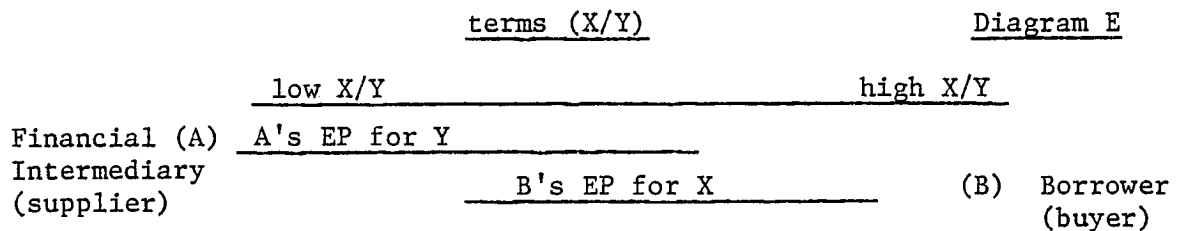
good X = deposit funds (in dollars)
 good Y = one dollar (of interest payment)



4. Loan transactions represent exchanges between financial intermediaries, as suppliers, and domestic or foreign firms and households, as buyers of credit funds. The terms of trade are scaled as "loan dollars/one dollar of interest payment. An example of a loan transaction is provided below.

Loan Transaction

good X = credit funds (in dollars)
 good Y = one dollar (of interest payment)



know you have cheated, shut up and pay: if the IRS finds deliberate fraud, it can and will assess heavy criminal fines as well as back taxes."

Time/ March 20, 1978

CHAPTER FOUR - LIMITED-PURPOSE INTERACTIONS IN CIRCULAR FLOW ANALYSIS

The Circular Flow as a Social Organization: Developmental Analysis

Chapter one presented an overview of the scope and method of analysis in our test simulation. Chapter two presented the conceptual set we employed to construct the static model of the circular flow system in chapter three. This chapter develops particular "limited-purpose" interaction models (LPM's) by which players organize to enhance their interpersonal (social) power in circular flow transactions.

If the goal of players in our model is to satisfy their economic wants, then interpersonal power, as used in this paper, refers to their ability to satisfy these wants via transactions with other players. Whether, and on what terms, these transactions will occur depends on the means that players employ, as illustrated by the limited-purpose models in this chapter. Once established, these models will be combined in chapters five and six to investigate principal interactions at the micro (reductionist) and macro (holistic) levels of the circular flow system. The following section lists the primary definitions, assumptions, and theorems of Kuhn's transaction model,¹ out of which the theorems of our limited-purpose models are derived.

Main Definitions of Transaction Theory

1. A good is defined as any external that can produce satisfaction when acquired or achieved. Goods generate approach responses and comprise the substance of the exchange between parties in our transaction model.

¹A more complete discussion of the transaction model be found in Kuhn, pp. 172-232.

2. We shall define the entity X as the good initially held by Party A and desired by Party B.
3. The entity Y is the good initially held by Party B and desired by Party A.
4. Party A's effective preference for good Y is his reservation price in terms of the maximum amount of good X he is willing and able to provide to Party B in exchange. Party B's effective preference is the maximum amount of Y he is willing and able to give for X.
5. Transaction theory interrelates the effective preferences of the interacting parties to delineate the range of possible settlement terms on which the transaction will be completed. Changes in this range over time occur with changes in the selector or effector states of the parties toward the goods exchanged.
6. The power forces which mold the effective preferences (EP's) of the parties for goods X and Y exchanged in the transaction are defined in the following manner:
 - 6.1 The symbol (AY) denotes the subjective value of good Y to Party A. A party to a transaction is a player, or collectivity of players, that makes rational decisions as a unit. AY represents the strength of A's subjective desire for good Y, or the cost to A of not having Y.
 - 6.2 The symbol (AX) denotes the subjective value of good X to Party A. AX represents the strength of A's desire not to exchange X for Y, or his desire not to complete the transaction. It also represents the cost to A of supplying good X to Party B.

Party A's effective preference (EP) for good Y is measured by A's gross preference for good Y (AY) diminished by the foregone benefit of good X (AX), or $(AY - AX)$.

 - 6.3 The symbol (BX) denotes the subjective value of good X to Party B. BX represents the strength of B's subjective desire for good X, or the cost to B of not having X.
 - 6.4 The symbol (BY) denotes the subjective value of good Y to Party B. BY represents the strength of B's desire not to exchange Y for X, or his desire not to complete the transaction. It also represents the cost to B of supplying Y to Party A.

Party B's effective preference for good X is measured by B's gross

preference for good X (BX) diminished by the foregone benefit of good Y (BY), or (BX - BY). The range of possible settlement terms at which AY exceeds AX and BX exceeds BY are the only possible terms on which a final settlement can be reached. Changes in party preferences for X and Y will alter one or both EP's in the transaction, and will affect the range of possible settlements.

Power in Transactions

7. A party's ability to bring about external states that contribute to the satisfaction of its wants is examined under the heading of power.
8. Interpersonal power is used in this model to mean the ability of a party to satisfy its wants in dealing with other parties. It refers to a party's ability to induce other parties to bring about overt external states that it desires by providing wanted goods in exchange. For example, Jimmy Carter's power to control wage and price increases depends not only on his willingness to do so, but also on his ability to provide goods to business and labor sufficient to induce their compliance with his desires.
9. A party's plain power (or simply power) to complete a transaction is a function of the subjective satisfaction received by both parties as measured by the amount of overlap of EP's. Plain power is defined as the ability to complete a given transaction regardless of the overt terms of trade.
10. Bargaining power is a crucial concept in the LOSS model, and it refers to a party's ability to get things on good terms in transactions with others by giving relatively little in exchange. Unlike other approaches taken in the literature,² Kuhn's concept of

²The reader is referred to the following works that treat the concept of bargaining power somewhat differently than the way we use it here:

Thomas C. Schelling, The Strategy of Conflict (Cambridge, Mass: Harvard University Press, 1960) p.22; Chamberlain, A General Theory of Economic Process, p.80; Jan Pen, "A General Theory of Bargaining," American Economic Review (March 1952) 42 (1): 24-42; Allen M. Cartter, Theory of Wages and Employment (Homewood: Richard D. Irwin, Inc., 1959), p.116; George C. Homans, Social Behavior-Its Elementary Forms Rev.ed. (New York: Harcourt Brace Jovanovich, Inc., 1974) pp.76-83; Fellner, Competition Among the Few, pp.24-33.

bargaining power refers to the entire range of possible terms of settlement and not to any particular set of terms within it. In any transaction, A's bargaining power varies directly with BX or AX and inversely with AY and BY. Party B's bargaining power varies directly with AY or BY and inversely with AX or BX.

11. Bargaining advantage refers to the ability of a party to move the terms from some proposed position within the range of overlap of EP's. A party's ability to pull the terms in his favor is discussed under the heading of transactional tactics.
12. Aggregate power is a stock concept and refers to a party's ability to satisfy a series of wants. A measure of A's aggregate power is his stock of X's (say, money) accumulated through a series of transactions with other parties.

Irrespective of the roles that are ascribed to parties in circular flow transactions, we shall presume that Party A wishes to exchange X for Y and that Party B wishes to exchange Y for X. The following assumptions, diagrams, and theorems illustrate the ways in which the above concepts are applied to transactions between parties in the circular flow.

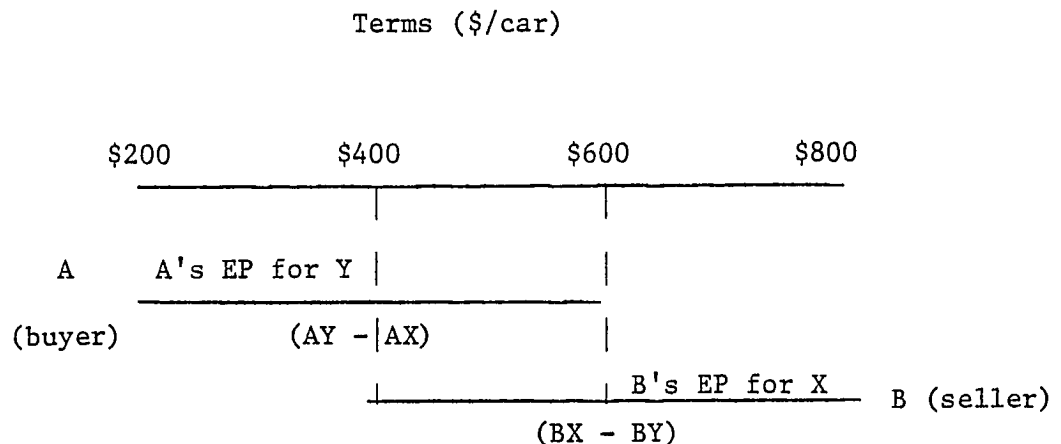
Main Assumptions of the Transactions Model

Return to the original circular flow assumptions, p. 21, and append assumption 3.2 (that all transactions are selfish-indifferent) with the following:

- 3.2.1 There are two parties involved, A and B.
- 3.2.2 There are only two goods involved, X and Y.
- 3.2.3 The EP's of the parties are allowed to change during negotiations.
- 3.2.4 Only goods are involved in the transaction. Goods reinforce approach rather than avoidance responses in each party's selector subsystem.
- 3.2.5 Neither party has desires relevant to the transaction other than those for X and Y.

- 3.2.6 Either party is able to withhold or provide the good desired by the other.
- 3.2.7 Each party knows its own preference for X and Y.
- 3.2.8 Each party makes rational decisions about the terms it is willing to accept.
- 3.2.9 No question of delivery is involved.
- 3.2.10 Contact between the parties has been made and the range of possible terms has been determined. The analyst is concerned with the actual terms on which the transaction will be completed.
- 3.2.11 Accurate communication between parties is assumed. The analysis focuses strictly on the valuations of the goods to the parties.
- 3.2.12 Each transaction is unique and independent.

Diagram 1: A simple product market transaction involving the exchange of money (good X) for an automobile (good Y)³.



The effective preferences (EP's) of the parties reflect their selector and effector states towards various terms of trade. For example, if A is the buyer of a car and B the seller, A's EP extends no further than 600 dollars per car, while B's EP extends no lower than

³The reader is referred to Kuhn's analysis of the same transaction in Alfred Kuhn, Unified Social Science (Homewood: The Dorsey Press, 1975) p. 109.

400 dollars per car. Party A's index represents the amount of car received in exchange for a given amount of dollars, while Party B's index is the amount of dollars received in exchange for a given amount of car. The EP diagram shows that the EP's of the parties overlap, and that a transaction is possible since terms exist for which both parties are willing to make the exchange. We may conclude from the EP diagram that if a transaction is completed, it will be on terms at or within the range of overlap of EP's. In this transaction the range of overlap exists between 400 and 600 dollars.

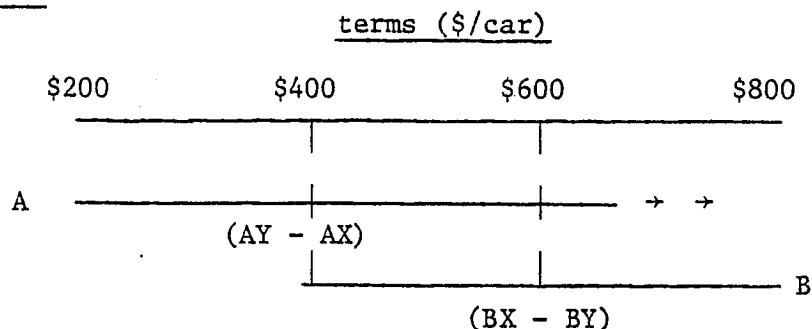
If the EP's do not overlap, then there are no terms which are acceptable to both parties, and the transaction will not be completed. If the EP's are just tangent, the transaction, if completed, will take place at the tangency terms only.

Theorems of the Transaction Model

Theorem 1

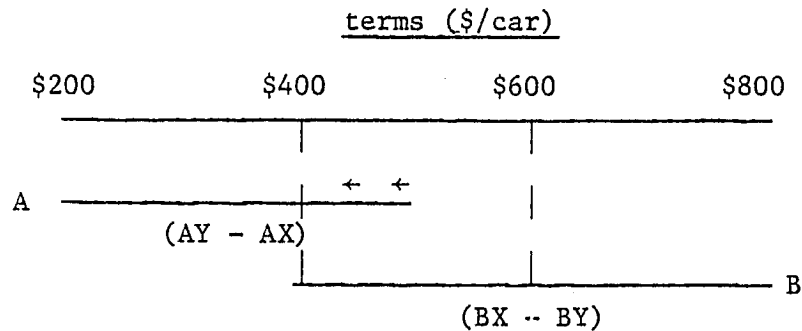
An expansion in A's EP, *cet.par.*, will increase the plain power of both parties to complete the transaction, but will decrease A's bargaining power and increase B's over terms if it is completed. A's EP will expand with either a decrease in AX or an increase in AY.

Diagram 2

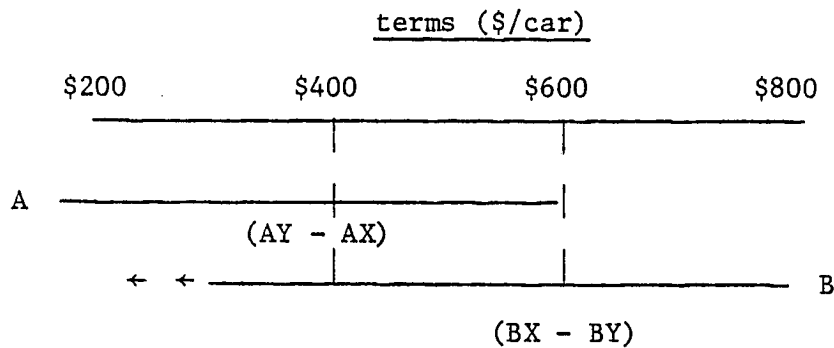


Theorem 2

A contraction of A's EP, cet.par., will decrease the plain power of both parties to complete the transaction, but will increase A's bargaining power and decrease B's over terms if it is completed. A's EP will contract with either an increase in AX or a decrease in AY.

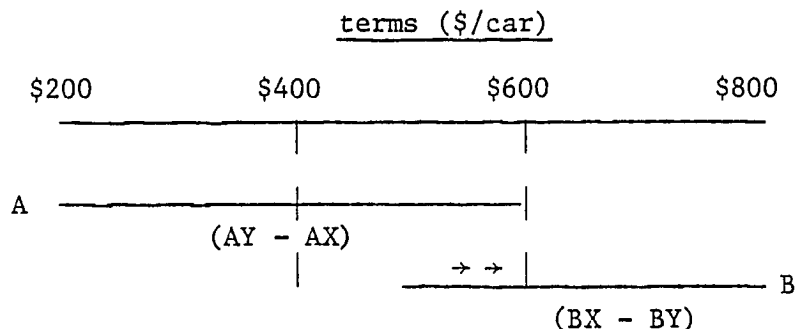
Diagram 3Theorem 3

An expansion of B's EP, cet.par., will increase the plain power of both parties to complete the transaction, but will increase A's bargaining power and decrease B's over terms if it is completed. B's EP will expand with either an increase in BX or a decrease in BY.

Diagram 4

Theorem 4

A contraction of B's EP, cet.par., will decrease the plain power of both parties to complete the transaction, but will increase B's bargaining power and decrease A's over terms if it is completed. B's EP will contract with either an increase in BY or a decrease in BX.

Diagram 5Theorem 5

The greater the overlap of EP's, the greater the difference in relative preferences of Parties A and B for goods X and Y, and therefore the greater the subjective benefit each will receive from completing the transaction: hence, the greater the probability of its completion.

Corollaries

1. A's bargaining power varies inversely with his own EP and directly with B's EP.
2. B's bargaining power varies inversely with his own EP and directly with A's EP.
3. A's bargaining power is always enhanced by B's greater desire for X, or his reduced desire for Y.
4. A's bargaining power is always reduced by B's lessened desire for X, or by A's own enhanced desire for Y.
5. B's bargaining power is always enhanced by A's greater desire for Y, or by his own reduced desire for X.
6. B's bargaining power is always reduced by his own enhanced desire for X, or by A's lessened desire for Y.

7. Since better terms for one party mean worse terms for the other, an increase in the bargaining power of one is equivalent to a decrease in the bargaining power of the other. It is not possible for the bargaining power of both parties to increase or decrease simultaneously.

Tactics And Strategy In Circular Flow Transactions⁴

Tactics

Tactics in transactions are actions taken by either party to modify the detector states of the other so as to alter his perceptions of either EP. Tactics deal with information or beliefs about existing opportunity or preference functions of either party in the transaction. For example, it is reputed that some used car dealers make a practice of concealing microphones in the customer lounge area as a means of learning the true EP's of prospective car buyers during the group decision process (assuming the decision is made jointly by verbalizing the relevant costs and benefits involved).

The following theorems are prerequisites to the continuing discussion of more complex interactions involving tactics:

Theorem 6

Party A's bargaining advantage is enhanced to the extent that A uses tactics to learn B's EP and then represents his own EP as just touching B's. This helps insure that if the transaction is completed, it will be on terms nearer A's end of the overlap.

Theorem 7

Party B's bargaining advantage is enhanced to the extent that B uses tactics to learn A's EP and then represents his own EP as just touching B's. This helps insure that if the transaction is completed, it will be on terms nearer B's end of the overlap.

⁴Kuhn, The Logic of Social Systems pp.187-193.

"In the old days, Yale University would just call you up and ask for money...Yale is still calling its alumni - now more than ever. But if you are one of its wealthier graduates, Yale researchers these days know a lot about you before they start dialing - from your income to the value of your home to whether one of your parents died of a particular disease... Yale wants to know these things in order to figure out how much money it should ask you for and what kinds of projects you might be willing to support...'Whatever you're selling, you want to know as much as you can about your customer", explains Clark Egeler, a deputy director of the Campaign for Yale. 'Modern fund raising is 90% research, 10% solicitation', says Michael Rajdock, a vice president for development at the University of Michigan".

Wall Street Journal/October 15, 1978, p.25.

Theorem 8

A's statement about his own EP will be made credible if A can present B with overt evidence that A's alternatives are at least as good as B's offer. This is also true for Party B in the transaction with A.

To gain the bargaining advantage through tactics, Party A should:

- a) avoid making the first offer.
- b) overstate the value of X and alternative sources of Y and understate the value of Y and the alternative sources of X.
- c) estimate B's EP and make his own offer credible at the tangency terms (see Schelling's "logic of self-commitment").⁵

The above tactics can also be used by Party B in dealing with A if the appropriate substitutions of symbols are made.

Strategy⁶

Strategy in transactions involves an attempt by a party to manipulate the actual EP's themselves. This is accomplished by changing the

⁵ Schelling, The Strategy of Conflict, p.24.

⁶ The reader may note that transactional tactics and strategies are irrelevant in market interactions characterized by pure competition (see the section on fixed-term transactions, p.82, of Kuhn, LOSS, p.217).

relative preferences which mold the EP's of the party. Advertising is one of the most commonly used transactional strategies.

The following theorems make explicit the relation between strategy and interpersonal power in transactions:

Theorem 9

Party A can increase his bargaining power in the transaction with Party B if he can successfully raise BX, reduce BY, raise AX, reduce AY, or some combination thereof.

Theorem 10

Party B can increase his bargaining power in the transaction with Party A if he can successfully raise AY, reduce AX, raise BY, reduce BX, or some combination thereof.

To gain bargaining power through strategy, Party A should:

- a) manipulate the actual preference function of either party.
- b) manipulate B's actual opportunity function by taking action to eliminate one or more of B's alternatives to X.
- c) manipulate his own opportunity function by taking action to expand his own alternatives to Y.

The above strategies can also be used by Party B in dealing with A if the appropriate substitutions of symbols are made.

Overall, in any transaction, one or both parties jockey for better positions in the terms of settlement through the successful implementation of tactics and strategies.

With reference to interaction in game theory, the value of the outcome to each of the parties is known in the gaming literature as their payoff. The particular pattern sequence of tactics and strategies each party may implement to achieve this outcome is known as a "game

strategy" and consists of one or a multiple of moves requiring a selected preference between one or more alternative tactics or strategies at each move.

Limited - Purpose Interaction Models

We will develop in this section a few special-purpose transaction models which will provide us with a deeper insight into the circular flow interactions which follow. These models include the following:⁷

- 1) The Model of Strategic Bads: Stress and Threats
- 2) The Model of Competition
- 3) The Model of Bargaining Power and Plain Power Coalitions
- 4) The Model of Three Party Pressure Transactions
- 5) The Model of Supply and Demand
- 6) The Model of Interrelated Transactions

The Model of Strategic Bads: Stress and Threats

We have stated previously (p.43) that strategy in transactions is an attempt by a party to alter selector states for the goods exchanged in transactions. If successful, strategy can alter EP's and change the power limits which specify the range of possible settlement terms. Strategy is not confined to "goods" however, and can frequently involve "bads" in the form of stress or threats. The usefulness of bads is in the avoidance response they generate within a party's selector subsystem,

⁷ A more detailed discussion of the basic principles of the following models can be found in Kuhn, The Logic of Social Systems, pp. 204-231. Theorems 23-64, pp.53 to 85 have been deduced from these basic models by the present author.

thereby creating the desire that the bad be removed. The additional cost a party is willing to accept in order that the bad be removed indicates the advantage of imposing strategic bads. The following assumptions and theorems apply to circular flow interactions involving bads, and represent another addition to the coverage of economic analysis.

Main Definitions

1. We define \underline{X} as "relief of the imposed stress (or non-performance of the threat)".
2. We define \underline{Y} as the good possessed by Party B and wanted by Party A.
3. \underline{AX} is A's desire not to relieve the stress (or to execute the threat).
4. \underline{BX} is B's desire that A relieve the imposed stress (or that A not execute the threat).
5. \underline{AY} and \underline{BY} remain the same as defined in the basic transaction model.

Main Assumptions

Relax assumption 3.2.4 (p.37), that only goods are involved, and assume instead:

Assumption 3.2.4'

Stress or threats can be applied by either party in the transaction.

The following theorems apply to transactions in which stress or threats are used:

Theorem 11

B's EP for X is in direct proportion to the stress or threat applied by A; the greater the stress or threat, the longer B's EP for X. Hence, A's plain power and bargaining power is raised in the transaction as B's EP for X expands (where X is removal of the bad applied by Party A).

Theorem 12

A's maximum power position in the stress transaction consists of extreme stress imposed and continued at low cost, and relieved at high cost to Party A.

Theorem 13

The larger the value of AY , the more stress or threat costs A is willing to impose on Party B in order to get Y, and the greater will be A's plain power and bargaining power in the transaction.

Theorem 14

If the application of strategic stress has costs to Party A, then A will not apply stress to B unless he believes it is sufficient to induce B to relinquish Y, and this cost to A must be less than the benefit to A of the Y received.

Theorem 15

An increase in the cost to Party A of imposing stress on Party B, *cet. par.*, will reduce A's desire not to relieve the stress (AX). Such a reduction in AX will expand A's EP in the stress transaction and raise both the plain power and the bargaining power of Party B.

Theorem 16

As the cost of applying stress to B is reduced for Party A, his desire to relieve the stress is reduced, raising AX and his bargaining power in the transaction.

Theorem 17

If the imposition of stress has continuing costs to Party A, such as strike costs might be to a union, A's decision to impose stress must include an estimate of when Party B is expected to make wanted concessions. Continuing costs to Party A of maintaining stress on Party B reduce A's desire not to relieve the stress. This decreases AX and raises B's plain power and bargaining power in the transaction over stress relief.

Theorem 18

Party A's bargaining advantage in the stress or threat transaction will be enhanced if AX is overstated and AY is understated. Party B's bargaining advantage is enhanced if BX is understated and BY is overstated.

The effectiveness of the threat as a strategy depends on its credibility. B's decision to provide Y in exchange for nonperformance of the threat must include not only the overt threat cost, but also an estimate of the probability that A will not execute the threat if he resists. The effectiveness of A's threat therefore depends on B's calculation of the expected value that it will not be executed regardless of B's behavior in the transaction. The following theorems describe the relation between threat credibility, power and bargaining power in the threat transaction.

Theorem 19

Failure to execute a threat will, cet.par., reduce A's credibility in future threats with Party B. A decline in credibility reduces B's cost of noncompliance. BX will decrease and so will A's power and bargaining power in subsequent threat transactions with B.

Theorem 20

Prompt execution of threats by Party A, cet.par., will raise A's credibility in future threats with Party B. An increase in credibility raises B's cost of noncompliance with A's demands. BX will increase and so will A's power and bargaining power in subsequent threat transactions with B.

Theorem 21

Party A can make his threats credible by:

- 21.1 maintaining capability in executing the threat,
- 21.2 making Party B believe that A has sufficient stake in executing the threat to justify his doing so.

Theorem 22

The deterrent effect occurs when B uses counterthreats to make A believe that the cost to A would exceed AY in the transaction, thereby preventing A from making the threat in the first place.

(Regarding threat strategies applied by President Carter to deter violations of the wage and price guidelines) "They

will be warned privately, then denounced publicly. If they do not reform, the Government will try to exclude them from bidding on federal contracts, possibly threaten them with unfavorable regulatory or antitrust action, and loosen restrictions (tariffs) that protect them against import competition - in brief, says one executive, use every extralegal level available 'short of sending in the FBI for the files at night'.

Time/October 30, 1978, p. 120.

The Model of Competition

Criterion 4 of this simulation model requires that pieces of our analytic model parallel pieces of the real economic system they represent. In reality, only a fraction of the market interactions that occur in the real system are completed under conditions of pure competition. The existence of single exchange ratios becomes less probable as the number of alternative sellers declines, as the Y's of sellers become more differentiated, as coalitions among sellers arise, or as information about alternative sources of Y is obscured. The existence of rivals is a market characteristic indicative of oligopoly and monopolistic competition. The analysis of these market interactions can be viewed through the following competitive model once the appropriate assumptions have been made explicit.

To present the model of competition we must first relax assumptions 3.2.1 and 3.2.12 (that only two parties are involved and that the transaction is unique) and instead assume that:

Assumption 3.2.1'

More than two parties are involved; two rival sellers (Parties B and C) and multiple buyers (Party A's).

Assumption 3.2.12'

Transactions are interrelated. The terms offered by B are affected by the occurrence or expectation of terms offered by C, and vice versa.

We now add the following assumptions to the model, some of which are well established postulates in conventional economic theory:

- 3.2.13 All competitors and their stated EP's are known to Party A's.
- 3.2.14 There is no collusion between competitors B and C.
- 3.2.15 Initially, competitors B and C have equal EP's for X. Their EP's will vary inversely with their marginal production costs in the short-run,⁸ and will vary directly with returns to scale in the long-run.
- 3.2.16 Parties B and C seek to maximize profit, and make product market decisions as specified in 4.0 - 4.3, p.27.
- 3.2.17 Party A's seek to maximize utility subject to limited money incomes, and make product market decisions as specified in 1.0 - 1.3, pp.25-26.
- 3.2.18 The production functions of Parties B and C reflect diminishing returns to scale within the feasible ranges of production.
- 3.2.19 Parties B and C face downward sloping demand and marginal revenue curves, and rising marginal cost curves as short-run output is increased.
- 3.2.20 The Y's provided by Parties B and C are normal goods, and are close substitutes.
- 3.2.21 Product demand for the Y's of B and C is price elastic with non-negative income elasticities that are less than unity.
- 3.2.22 The analysis is confined to short-run changes in price and output for Parties B and C.
- 3.2.23 The stated EP's of Parties B and C are the same for all Party A's.

⁸I have tied the EP's of sellers B and C to changes in their short-run marginal costs of production. However, long-run adjustments in their scales of plant, which enhance efficiency, will also affect their EP's in product market transactions with Party A's.

3.2.24 The EP's of Party A's in dealing with B or C reflect differences in money incomes and preferences. The Y's of B and C are not homogeneous.

Overview of the Model of Competition

Although only one Party A is presented in diagrams 6 - 12, pp. 52 - 58, all market interactions in diagrams 7a - 12b involve multiple A's, each of whose EP's must meet the stated terms of trade if transactions are to be completed with B or C. With respect to the relation between these diagrams, a contraction of C's EP, *cet.par.*, (theorem 25, p. 55) will decrease his plain power to complete transactions with Party A's, while the plain power of Party B will be increased. We would therefore expect the number of completed transactions to decline for Party C and to increase for Party B (by assumptions 3.2.17 and 3.2.20) which, by assumption 3.2.21, will raise sales and profits for Party B and reduce sales and profits for Party C. Conversely, an expansion of C's EP, *cet.par.*, (theorem 26, p. 56) will lead to greater sales and profits for C and lower sales and profits for Party B. Similar conclusions have been reached in theorems 23 and 24 for *cet.par.* changes in B's EP, as illustrated by market diagrams 7a and 8a, pp. 53 and 54. Changes in the EP's of A's, *cet.par.*, resulting from changes in money incomes (theorems 27 and 28) reflect changes in effective demand for the Y's of both B and C as illustrated in the market diagrams, pp.57 and 58.

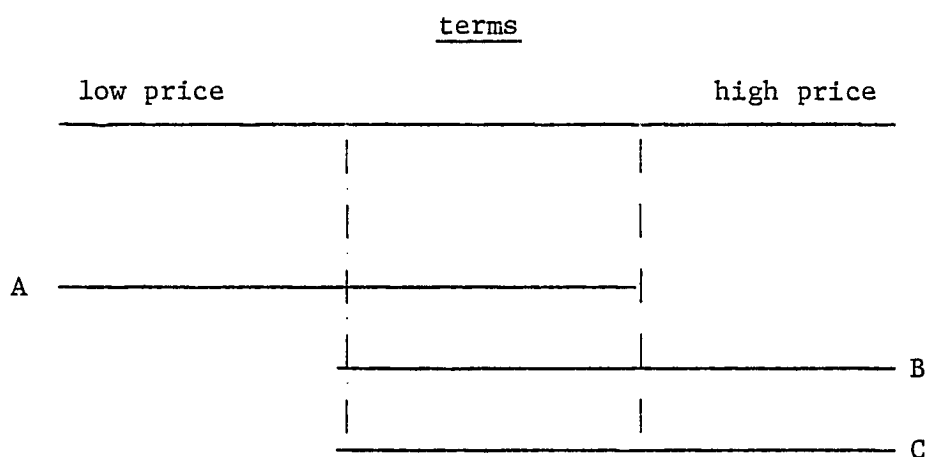
The main theorems of this competitive model allow us to infer determinate changes in prices, sales, and profits of rival sellers that result from *cet.par.* changes in production costs or product demand. The following axiom (Kuhn, LOSS, p.217) lays the foundation for the deduced theorems

that follow:

Axiom 1

The best terms available from one competitor provide a floor under the bargaining power of Party A in dealing with any other competitor, and a ceiling on the bargaining power of all other competitors in dealing with A. As soon as A knows the terms on which he can get Y from one competitor, his EP for Y will not extend beyond those terms in dealing with any other party.

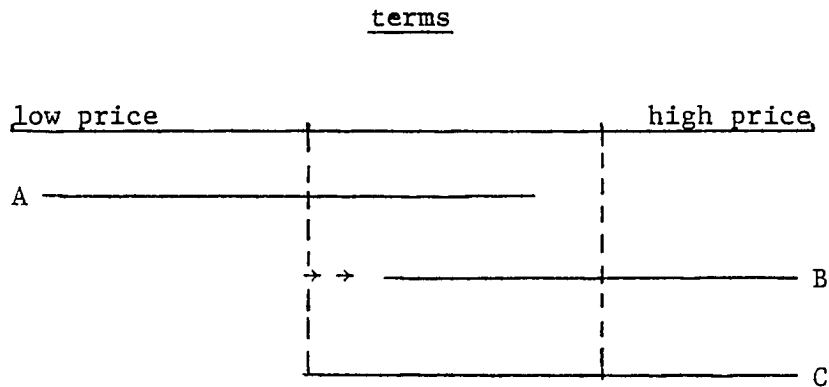
Diagram 6



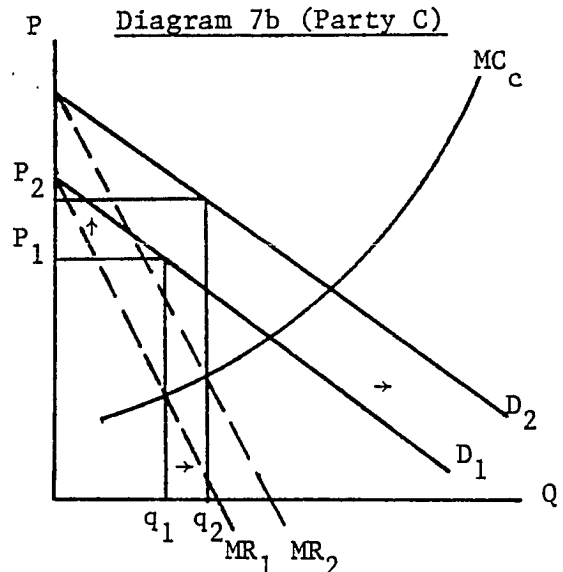
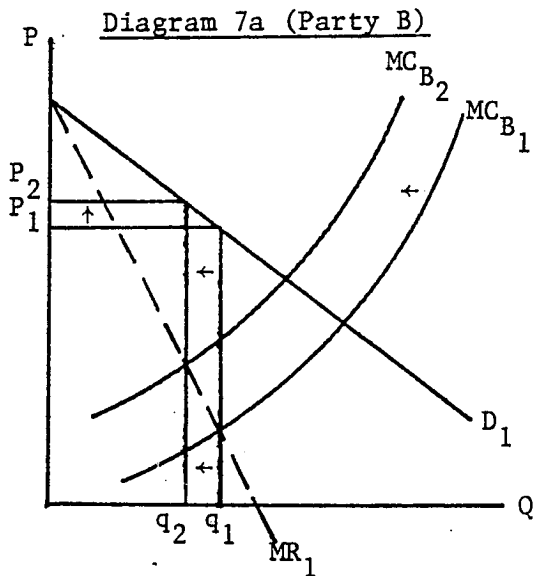
Theorem 23

A contraction of B's EP, cet. par., due to either an increase in BY or a decrease in BX will reduce B's plain power in the transaction with A. It will also raise C's plain power and bargaining power in the transaction with A, since it lowers the floor under A's bargaining power in dealing with C and raises the ceiling on C's bargaining power in dealing with A. Party A's bargaining power will be reduced in the transaction with both B and C.

Diagram 7



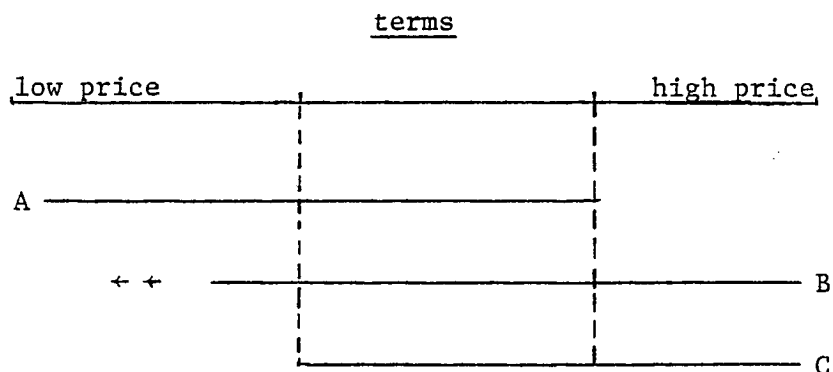
With respect to a market interaction involving multiple A's, a cet. par. contraction in B's EP will result in fewer sales (and profits) to B. Party C's demand curve will shift outward and C's sales will increase, as will C's price and profits in transactions with A's as illustrated in the diagrams below.



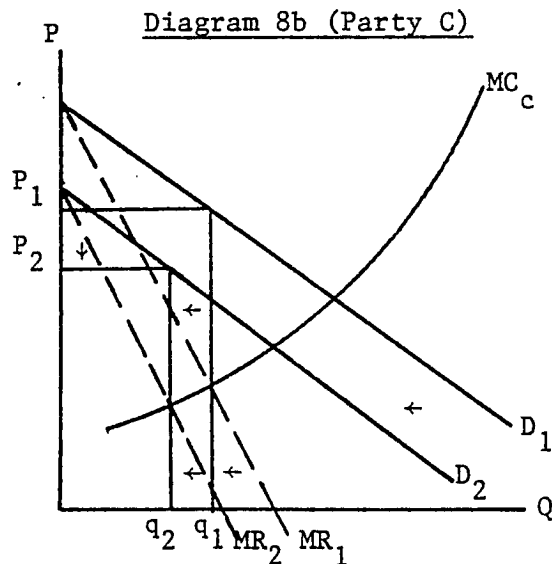
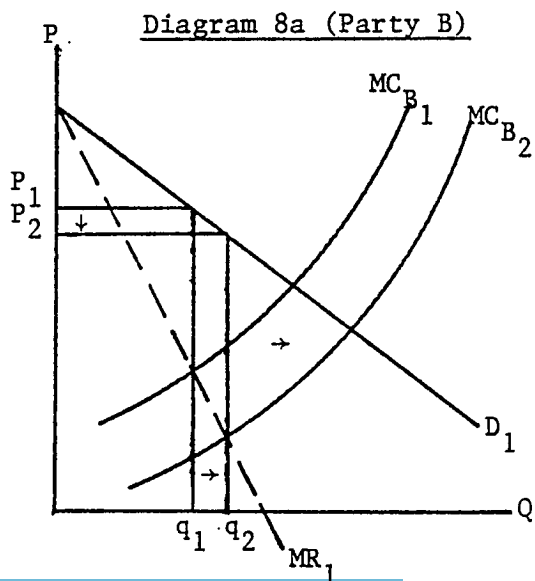
Theorem 24

An extension of B's EP, cet. par., due to either an increase in BX or a decrease in BY, will lead to an increase in B's plain power but a reduction in his bargaining power in the transaction with A. Both Party C's plain power and bargaining power will decrease in the transaction with A. Party A's plain power and bargaining power will increase in the transaction with B, while his plain power will decrease and his bargaining power will increase in the transaction with Party C.

Diagram 8



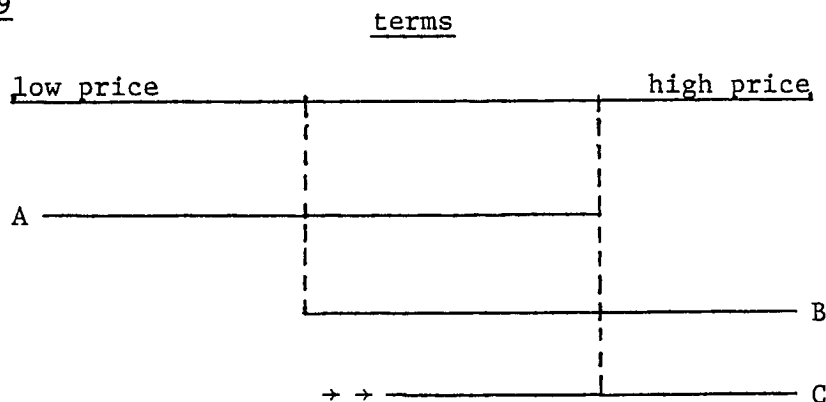
With respect to a market interaction involving multiple A's, a cet. par. expansion in B's EP will result in greater sales (and profits) to B. Party C's demand curve will shift inward and C's sales will decrease, as will C's price and profits in transactions with A's as illustrated in the diagrams below.



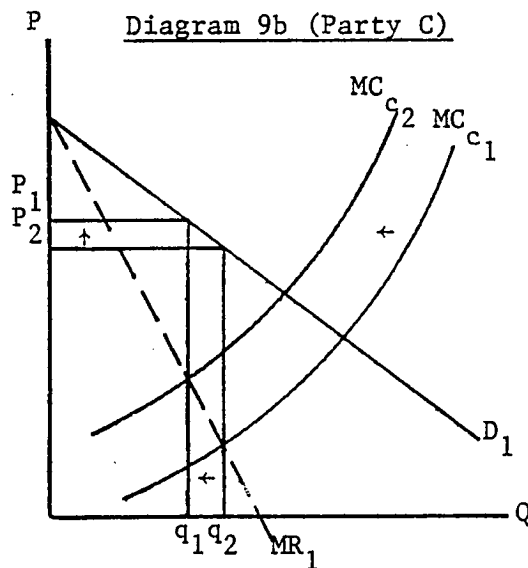
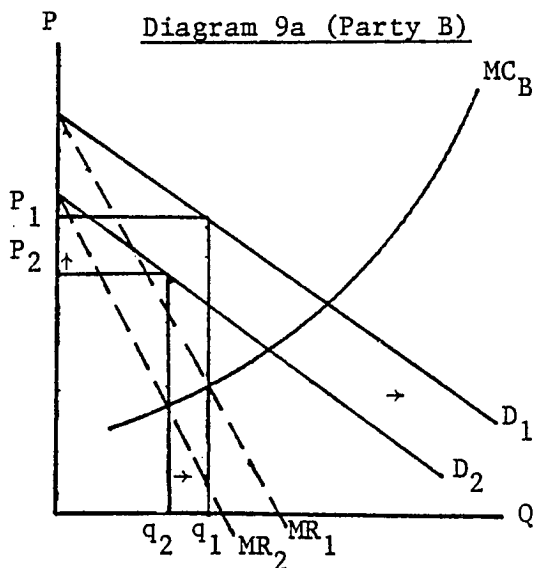
Theorem 25

A contraction in C's EP, cet. par., due to an increase in CY or a decrease in CX, will reduce C's plain power to complete the transaction with A. B's plain power and bargaining power will rise in the transaction with A since the contraction in C's EP lowers the floor under A's bargaining power in dealing with B and raises the ceiling on B's bargaining power in dealing with A. Party A's plain power and bargaining power are decreased in the transaction with Party C as C's EP for X contracts.

Diagram 9



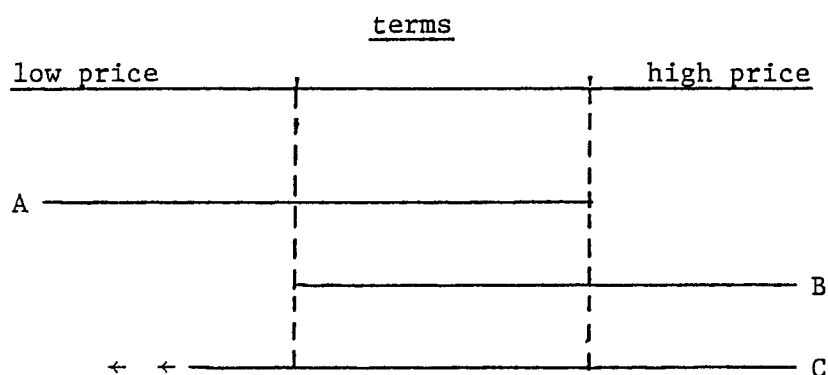
With respect to a market interaction involving multiple A's, a cet. par. contraction in C's EP will result in fewer sales (and profits) to C. Party B's demand curve will shift outward and B's sales will increase, as will B's price and profits in transactions with A's as illustrated in the diagrams below.



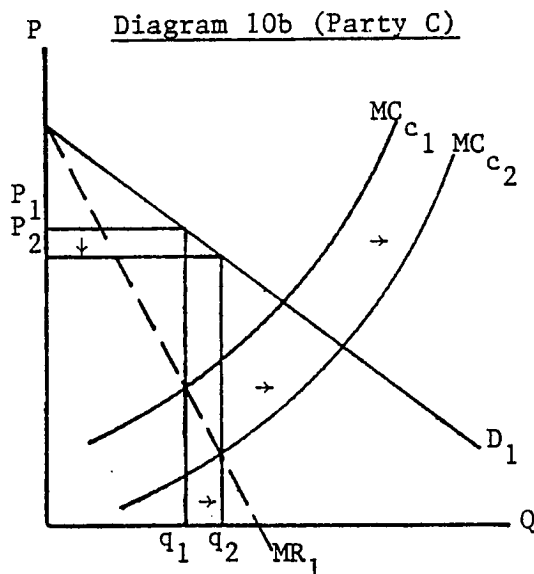
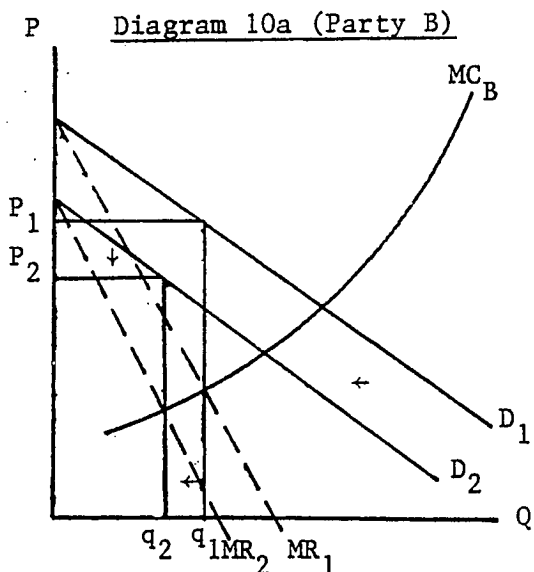
Theorem 26

An expansion of C's EP, cet. par., due to either an increase in CX or a decrease in CY, will increase C's plain power and decrease his bargaining power in the transaction with Party A. Party B's plain power and bargaining power will decrease in the transaction with A, as A's bargaining floor shifts left by the extent of the expansion in C's EP. Party A's bargaining power will increase in the transaction with both Parties B and C, while his plain power will increase in the transaction with C, and decrease in the transaction with B.

Diagram 10



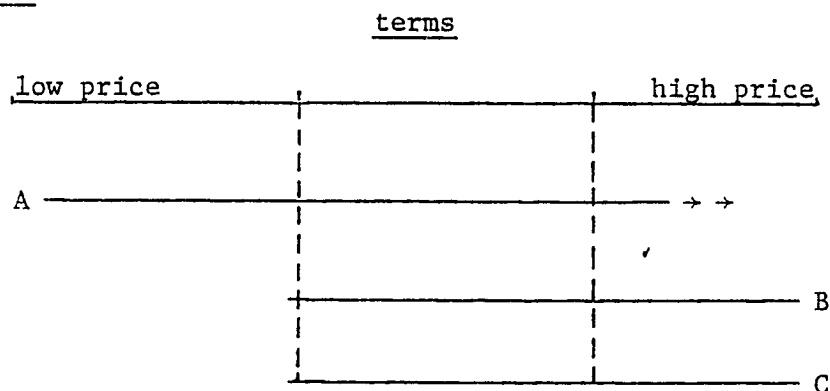
With respect to a market interaction involving multiple A's, a cet. par. expansion in C's EP will result in greater sales and profits to C. Party B's demand curve will shift inward and B's sales will decrease, as will B's price and profits in transactions with A's, as illustrated in the diagrams below.



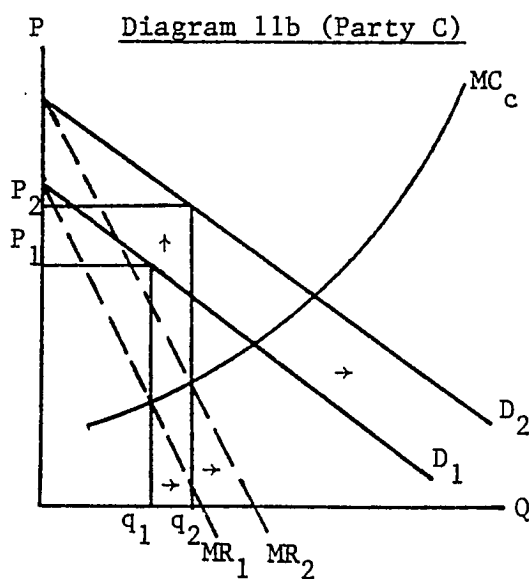
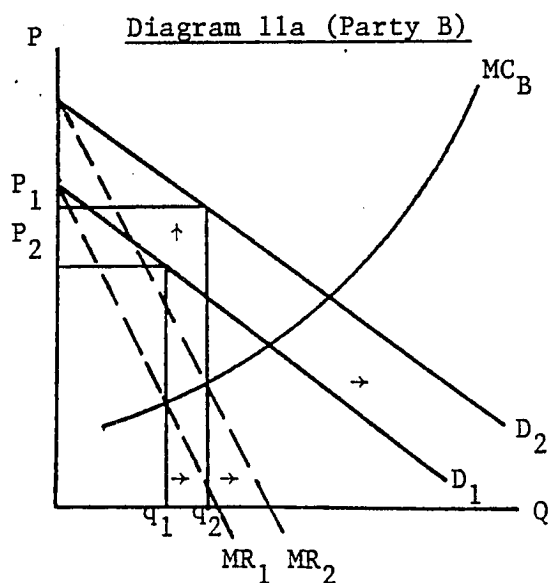
Theorem 27

An expansion of A's EP, cet. par., due to either an increase in AY or a decrease in AX will raise his plain power to complete the transaction with B and C, but will decrease his bargaining power in each. Both the plain power and the bargaining power of B and C will increase in the transaction with A.

Diagram 11



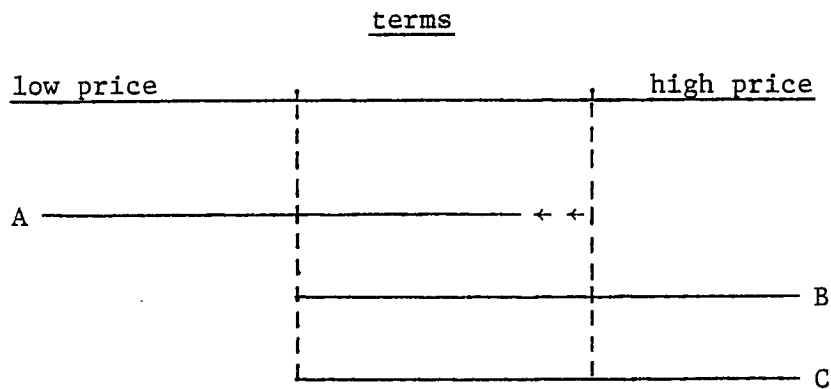
With respect to a market interaction involving multiple A's, an expansion in the EP's of A's (due to increases in their real incomes) will result in greater sales and profits to both B and C. The demand for the Y's of both B and C will increase, as will their market prices. This is shown in the diagrams below.



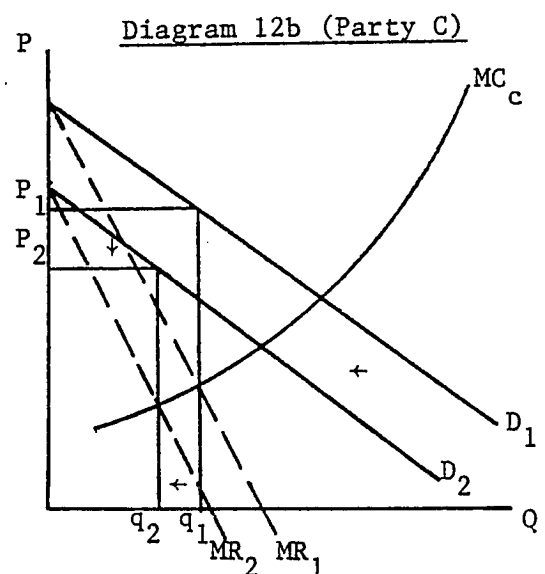
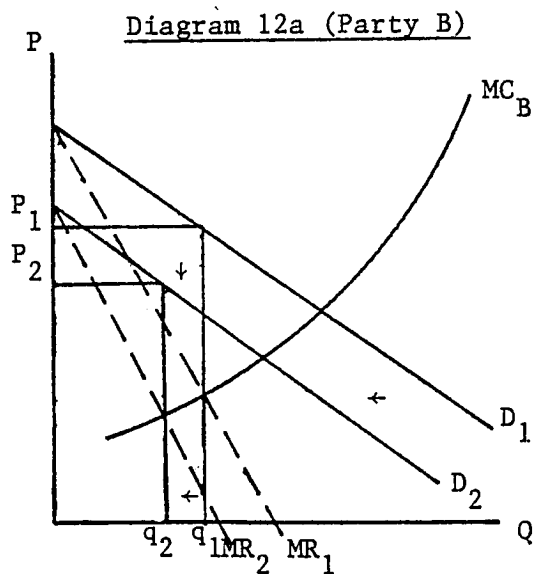
Theorem 28

A contraction of A's EP, cet. par., due to either a decrease in AY or an increase in AX will decrease his plain power to complete the transaction with B and C, but will increase his bargaining power in each. Both the plain power and the bargaining power of B and C will decrease in the transaction with A.

Diagram 12



With respect to a market interaction involving multiple A's, a contraction in the EP's of A's (due to a decline in their real incomes) will result in lower sales and profits to both B and C. The demand for the Y's of both B and C will decrease, as will their market prices. This is shown in the diagrams below.



Corollaries

8. C's plain power and bargaining power in the transaction with A will vary inversely with changes in B's EP for X.
9. B's plain power and bargaining power in the transaction with A will vary inversely with changes in C's EP for X.
10. In transactions with C, A's plain power varies inversely, and his bargaining power varies directly with changes in B's EP for X.
11. In transactions with B, A's plain power varies inversely, and his bargaining power varies directly with changes in C's EP for X.

The successful application of tactics by competitive sellers will mean that in addition to estimating the length of A's EP for Y, Parties B and C must also estimate the length of the competitor's EP and then represent his own EP to A as the shortest, safest distance beyond his competitor's EP. Viewed developmentally, this process of competitive bidding between rival sellers will lead to progressively better terms to consumers in product market transactions (innovative products at lower prices) as each seller seeks to raise his plain power with Party A by offering better terms than his rival(s). Competition between sellers therefore seems to be a key element in the concept of "Consumer Sovereignty" in product market transactions with producers in the circular flow, since it acts to raise A's plain power and bargaining power in the transaction with both B and C. Parties B and C could, however, engage in a collusive bargaining power coalition (to be discussed shortly) in which each agrees not to provide Y to A for less than some specified terms. By eliminating uncertainty about the reaction of his rival, each seller can prevent any further decline

in his bargaining power in the transaction with A.

Freddie Laker is no Rickenbacker...In June, Laker won approval from the Carter administration to offer round-trip flights between New York City and London on his 13-jet Laker Airways for \$236 - almost \$100 less than the cheapest non-charter fare...six major airlines countered with a cut-rate transatlantic fare of their own, tossing in some of the amenities that Laker's no-frills Skytrain omits... The six major carriers came up with their new fare in Geneva after a three day meeting of the International Air Transport Association, the industry group that sets fares charged by most scheduled overseas carriers. IATA's officials were pleased that the organization had moved swiftly to avoid a messy price war among members - and wage it instead with Laker ...Says Laker, 'The big carriers are now united in their determination to put us out of business. They have slashed their own fares, changed their own rules, and granted themselves all the advantages denied us under the terms of our license'.

Time/August 29, 1977, p. 54.

Theorem 29

Party A's bargaining advantage is enhanced in the transaction with C to the extent that A employs credible tactics that make C believe B's EP is longer than it actually is. (A credibly misrepresents B's EP for X to C)

Theorem 30

Party B's bargaining advantage is enhanced in the transaction with A to the extent that B employs credible tactics to make A believe that C's EP for X is shorter than it actually is. (B credibly misrepresents C's EP to A).

Theorem 31

Party C's bargaining advantage is enhanced in the transaction with A to the extent that C employs credible tactics to make A believe that B's EP for X is shorter than it actually is. (C credibly misrepresents B's EP for X to A)

To gain a bargaining advantage through tactics, Competitor B seeks to make A believe that B is capable of providing better terms to A than is Party C. This can be accomplished in the following ways:

1. B can manipulate A's beliefs about C's preferences for X or Y, C's capacity to make these preferences effective, or both.
2. B can manipulate A's beliefs about B's own preferences for X or Y, B's capacity to make these preferences effective, or both.
3. B can manipulate A's beliefs about A's own preferences for X or Y, A's capacity to make these preferences effective, or both.

Each of the above tactical methods can be, and often is, employed by competitors in all types of circular flow transactions to reduce the plain power of rival sellers (e.g. advertising).

Theorem 32

Party B can raise his plain power and bargaining power in the transaction with A if he can successfully impose stress or threat strategies to induce a contraction of C's EP for X, cet.par., in the transaction with A.

Theorem 33

Party C's plain power to complete the transaction with A varies inversely with the stress or threat costs imposed on C by Party B.

Similar deductions can be made for Party C (in theorem 32) and for Party B (in theorem 33) if the appropriate substitution of symbols are made.

The Models of Bargaining Power and Plain Power Coalition⁹

Relax Assumption 3.2.14, p.50 of the competitive model (that there is no collusion among competitors) and assume instead:

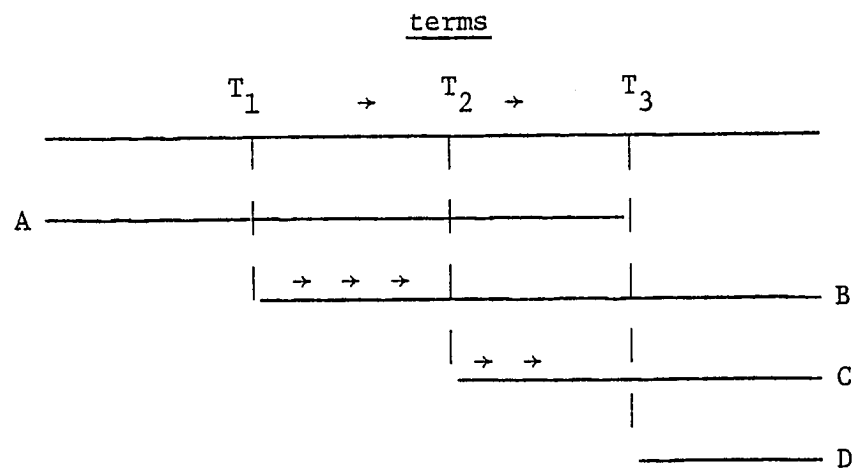
⁹The reader is referred to William Fellner's classic work on Oligopoly behavior, Competition Among the Few; the economic context of which illustrates many of the nomothetic theorems derived from our competitive and coalition models.

Assumption 3.2.14'

The possibility of coordinated action between parties exists.

In our study of circular flow interactions, coalition (a specialized form of collusion) is relevant.

A bargaining coalition is a coordinated action among competitors to improve their bargaining power or plain power in transactions with A's.

Diagram 13

We have already seen that the best terms available from one competitor set the floor under A's bargaining power in dealing with any other competitor, and the ceiling on the bargaining power of all other sellers in dealing with A. A coalition of strongest competitors can improve their bargaining power with A by taking collective action to restrict their EP's to some specified terms. If there were no collusion among sellers in the previous diagram, A's bargaining floor in the transaction with C or D would not extend beyond T_1 (Axiom 1., p.52). Parties C and D would be unable to complete the transaction with A

as long as A is able to complete it with B at terms between T_1 and C's EP.

A bargaining power coalition is created when Parties B, C, and D agree to restrict their EP's to (say) T_3 . Under these conditions, A's bargaining floor in dealing with C and D will shift to T_3 . OPEC is one of the best known examples of the use of coalition to raise bargaining power. Presumably, Party B will not agree to join the coalition unless the expected future benefit of increased bargaining power equals or exceeds the expected future cost in the reduction of plain power to complete the transaction with A. The coalition is seen as all benefit to Parties C and D, since the plain power and bargaining power of each is increased. The coalition is seen as all cost to Party A who loses plain power and bargaining power in transactions with each seller as long as the coalition can effectively withhold Y from A at terms below T_3 . Since the strongest competitor (B) stands to gain the least from the coalition, he will be the most likely to break away and "go it alone, like Diana Ross, Anwar Sadat and Paul Simon.

The following additional assumptions are necessary for our continuing discussion of bargaining power coalitions:

Assumption 3.2.18

Parties B and C form a bargaining power coalition and contract the coalition's EP to terms T_2 .

Theorem 38

The ceiling on the coalition's bargaining power from applying stress or threat to contract D's EP lies at the best alternative terms available to A from Party E (at terms T_4).¹¹

Theorem 39

The coalition's bargaining advantage in the transaction with Party A is enhanced to the extent that it employs credible tactics to make A believe that D's EP for X is shorter than it actually is.

Theorem 40

Party A's bargaining advantage is enhanced in the transaction with the coalition to the extent that A employs credible tactics to make the coalition believe that D's EP for X is longer than it actually is.

Plain Power Coalitions

A plain power coalition exists when two or more competitors pool their resources to extend their collective EP and raise their plain power to complete an otherwise impossible transaction with Party A. This is done by pooling the individual power of Parties B and C into a larger aggregate than they can command separately on their own. For example, by pooling funds, ten farmers may be able to purchase heavy farm machinery that none alone would be able to afford, or a joint group of Cincinnati businesspersons might join with the club owner in a plain power coalition in order to be able to offer Superstar Pete Rose enough salary to keep him playing for the Cincinnati Reds. This type of coalition raises the plain power of its members by its ability to collectively offer A more than the owner alone can personally afford. This does not preclude the possibility that plain power coalitions can

¹¹The extent to which the coalition can gain from applying pressure to Party D is limited by the next best alternative to A, other than D, namely Party E.

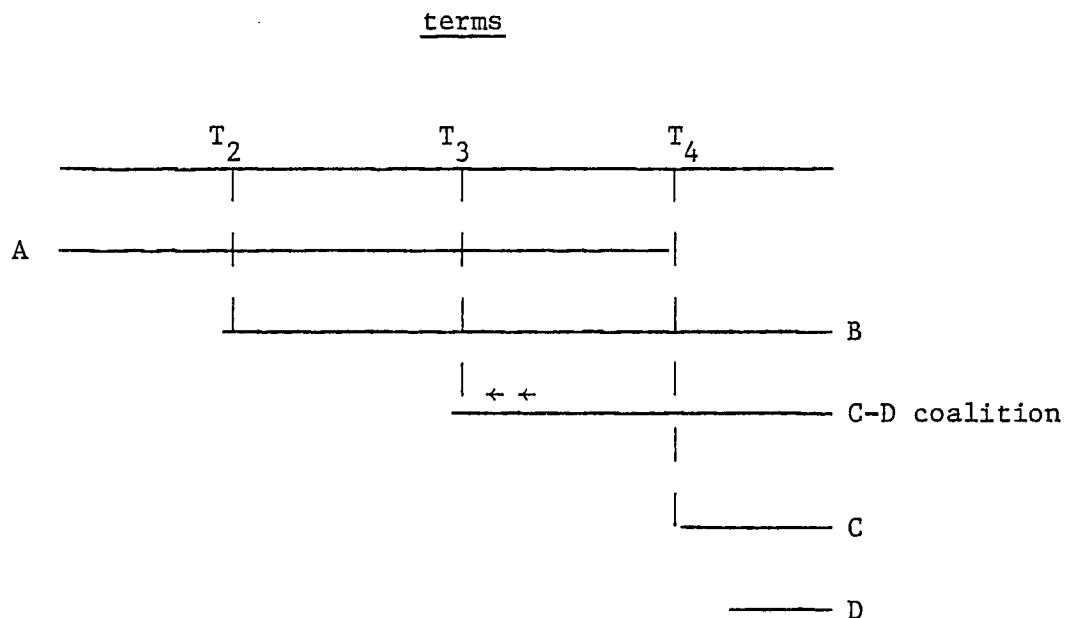
also be formed to impose bads on a recalcitrant Party A in order to raise the coalition's plain power and bargaining power in dealing with A.

The following assumption is added to analyze plain power coalitions:

Assumption 3.2.20

Parties C and D form a plain power coalition. The coalition's EP extends to terms T_3 .

Diagram 15



Theorem 41

The formation of the plain power coalition between C and D allows A's EP to contract in transactions with B. The coalition, in addition to raising its own plain power in the transaction with Party A, also reduces the plain and bargaining power of Party B in the process. B's plain power and his bargaining power in transactions with A is reduced by the cet.par increase in the coalition's EP in providing Y to A.

Theorem 42

The formation of the plain power coalition between C and D is seen as all benefit to Party A and as all cost to Party B.

Plain Power Coalition: Strategy and Tactics

Theorem 43

Party B can enhance his bargaining advantage in the transaction with Party A if he employs credible tactics to make A believe that the coalition's EP for X is shorter than it actually is.

Theorem 44

The coalition can enhance its bargaining advantage in the transaction with Party A if it employs credible tactics to make A believe that Party B's EP for X is shorter than it actually is.

Theorem 45

The coalition can raise its power and bargaining power in the transaction with Party A if it can effectively impose bads that induce a contraction of B's EP for X.

The Model of Three Party Pressure Transactions

Return to the original transaction model, p. 37, and replace assumptions 3.2.1, 3.2.2, and 3.2.4 with the following:

Assumption 3.2.1'

There are three parties involved: A, B, and C.

Assumption 3.2.2'

More than two goods (multiple goals) are involved in the interaction.

Assumption 3.2.4'

Stress or threats can be applied by any party.

The following additional assumption applies to this model:

Assumption 3.2.21

There is no transaction between Parties A and C.

A three party pressure transaction is one in which a third party, C, uses strategy or tactics in goods or bads with Party B in order to

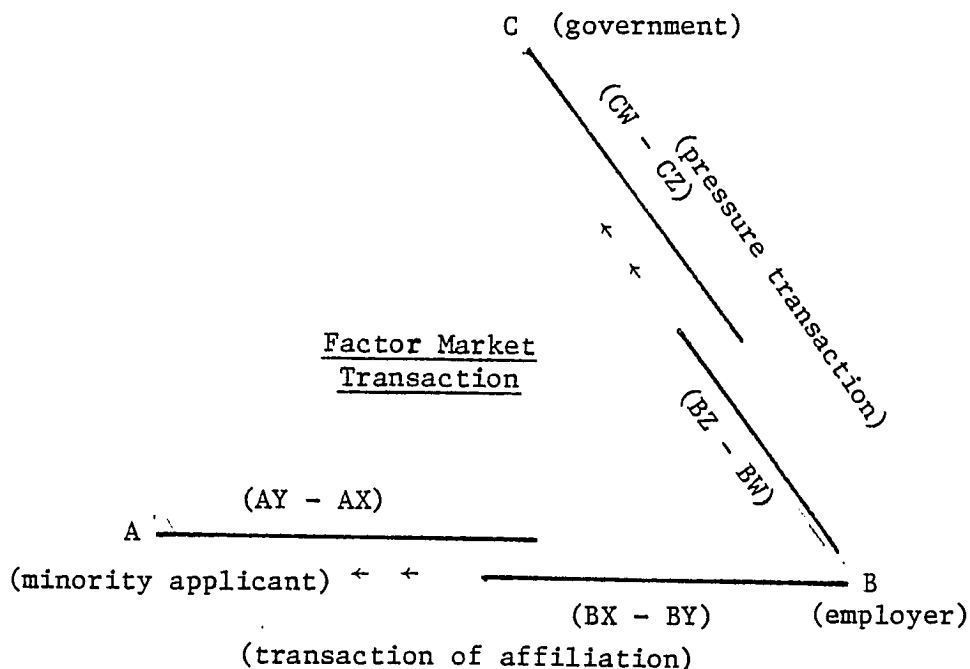
raise A's plain power and bargaining power in transactions with B. An example of a three party pressure transaction is one in which a third party, government (C), applies stress or threats to an employer (B) as a means of raising the plain power and bargaining power of a minority applicant (A) in factor market transactions with employer (B).

"... Most affirmative action programs exist because employers cannot get federal contracts without them. Last week the Government said it would no longer buy from Uniroyal, charging that the company had balked at setting up an affirmative-action program for women. Uniroyal is only the 21st company to be so penalized in 15 years, but it is the biggest - with \$35 million in outstanding Government contracts."

Time/July 9, 1979

The following diagram, definitions, and theorems apply to this model.

Diagram 16



Definitions

1. Good X represents factor input contributions to B's organization provided by A.
2. Good Y represents wage payments provided by employer B to applicant A.
3. Good W represents C's desire that B hire A.
4. Good Z represents the stress or threat relief to employer B in transactions with C.
5. A's EP for Y represents A's net preference for employment with B, or $AY - AX$.
6. B's EP for X represents B's net preference¹² for hiring applicant A, or $BX - BY$.
7. C's EP for W represents C's net preference that B hire A in terms of the amount of stress or threat costs C is willing and able to apply to B, or $CW - CZ$.
8. B's EP for Z represents B's net preference to avoid stress or threat costs applied by C in terms of the additional expense B is willing and able to accept by hiring A, or $BZ - BW$.

Theorem 46

B's EP for Z in transactions with C varies directly with the amount of stress or threats applied to B by C on behalf of A. (from theorem 11)

Theorem 47

B's EP for X in transactions with A varies directly with changes in B's EP for Z in transactions with C. (C's performance of Z is contingent upon the amount of Y that B provides to A.)

Theorem 48

B's EP for X in transactions with A varies directly with changes in the amount of stress or threat costs applied to B by C on behalf of A. (from theorems 46 and 47)

¹²In this interaction, Party B's preferences delineate Party A's opportunities in the transaction of affiliation with Party B. The existence of multiple goals means that B's desire to avoid C's threat adds to his EP to hire A, thereby raising A's power and bargaining power in the transaction with B.

Relax Assumption 3.2.21 (p.67) which states that there is no transaction between Parties A and C. Assume instead that:

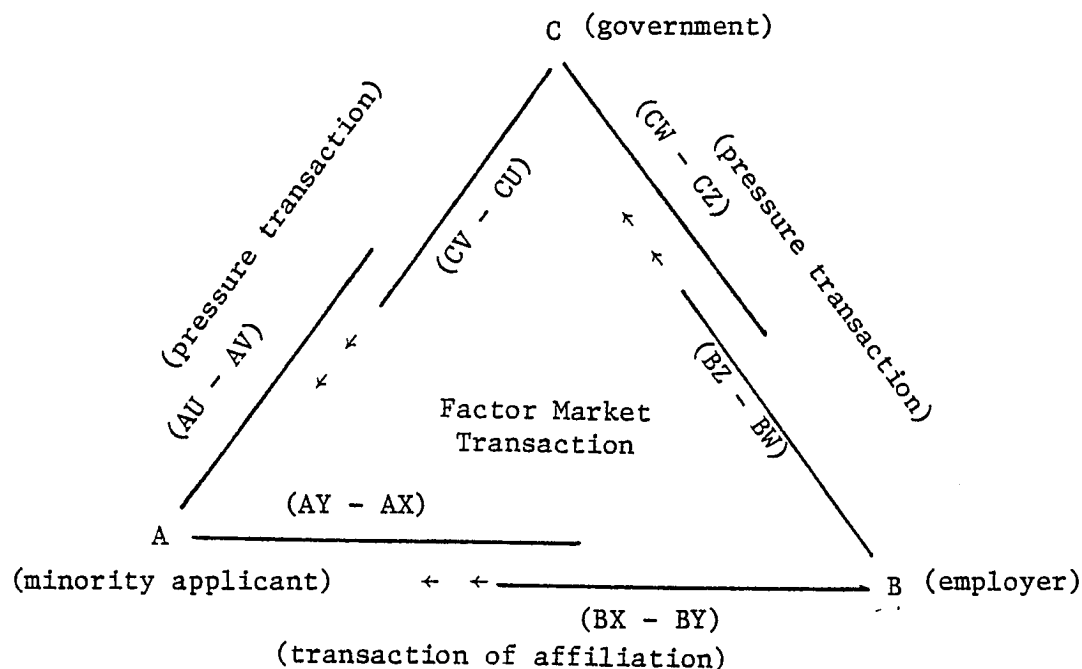
Assumption 3.2.21'

Party A (or a formal organization of A's) applies pressure to C to improve A's power position in dealing with Party B.

In addition to the definitions given on page 69 we now list the following:

9. Good U represents stress or threats applied by Party C to Party B on behalf of A in an attempt to improve A's power and bargaining power in dealing with B.
10. Good V represents the stress or threat relief promised by A upon receipt of good U from Party C.
11. C's EP for V represents C's net preference that A perform V in terms of the amount of cost C is willing and able to bear in applying stress or threats to B on behalf of A. C's EP for V equals $(CV - CU)$.
12. A's EP for U represents A's net preference that C apply stress or threat, diminished by A's desire not to perform V. A's EP for U equals $(AU - AV)$.

Diagram 17



Theorem 49

The amount of stress or threat that C is willing to apply to B on behalf of A varies directly with changes in C's EP for V in transactions with A. (A's performance of V is contingent upon the amount of stress that C applies to B on behalf of A.)

Theorem 50

C's EP for V in transactions with A varies directly with the amount of stress or threats applied by A. (from theorem 11)

Theorem 51

The amount of stress or threat that C is willing to apply to B on behalf of A varies directly with changes in the amount of stress or threats applied to C by A. (from combination of theorems 49 and 50)

Theorem 52

B's EP for X in transactions with A varies directly with changes in the amount of stress or threats applied to C by A. (from combination of theorems 48 and 51)

We have seen previously (theorems 1-4, pp. 39 - 41) how cet.par. changes in EP's lead to changes in plain power and bargaining power in transactions between parties. With the addition of the following theorems (53 - 58) our limited-purpose pressure model will be complete enough to deduce changes in power and bargaining power between parties in one transaction that result from cet.par. changes in power factors in other interrelated transactions. These theorems are as follows:

Theorem 53

Party B's bargaining power in transactions with Party A varies directly with B's bargaining power in transactions with Party C (from theorem 51).

Theorem 54

Party C's bargaining power in transactions with Party B varies inversely with Party C's bargaining power in transactions with Party A (from theorem 51).

Theorem 55

Party A's bargaining power in transactions with Party B varies directly with Party A's bargaining power in transactions with Party C (from theorem 52).

Theorem 56

Party A's bargaining power in transactions with Party B varies inversely with Party B's bargaining power in transactions with Party C (from theorem 47).

Theorem 57

Party B's bargaining power in transactions with Party C varies directly with changes in Party C's bargaining power in transactions with Party A (from theorem 51).

Theorem 58

Party B's bargaining power in transactions with Party A varies inversely with changes in Party A's bargaining power in transactions with Party C (from theorem 52).

Implications of the Pressure Model

We are now ready to demonstrate a few operational characteristics of this pressure model. We shall present only a couple of parametric changes in the power factors which mold the EP's of the parties. This is considered sufficient to acquaint the reader with how this model can be applied to describe real circular flow interactions involving pressure strategies by third parties.

Let us assume the existence of a three party pressure interaction in which Party C applies stress to Party B on behalf of Party A in order to improve A's power and bargaining power in his transaction with Party B. Let us also suppose that a cet.par. increase occurs in the cost to C of applying stress to B. Such an increase in cost will reduce C's desire not to relieve the stress in the transaction stage of W for Z

with Party B. A reduction in C's desire not to relieve the stress he applies to B will lower CZ, extend C's EP for W, and raise C's power to get W from B as it reduces his bargaining power in the terms of settlement. By theorems 49 + 53, p. 71, an increase in B's bargaining power in transactions with C will contract his EP in transactions with A, reducing A's power to get Y and B's power to get X, while it raises his bargaining power and reduces A's in the terms of settlement. To summarize for Party A, an increase in the cost to C of applying stress to B on behalf of A will reduce both A's power to get Y from B as well as his bargaining power over the terms of settlement if the transaction is completed.

Another situation can exist where a cet.par. increase can occur in the cost to C of withstanding the stress applied by A in the transaction over U for V.

Return to the basic pressure model and assume instead that a cet.par. increase occurs in the cost to C of withstanding A's stress. Increased costs of this type will raise C's desire for stress relief, or CV in the transaction with A. This raises A's power to get U as well as his bargaining power over the terms of settlement. By theorems 49 and 54, p. 71, a reduction in C's bargaining power in the transaction with A will raise his power to get W from B as well as his bargaining power over the terms of settlement. This is because an increase in C's EP for V means that he is both willing and able to apply more stress to B to accept X from A in exchange for providing Y. By theorems 51 and 53, p. 71, a loss of bargaining power for B in the transaction with C

will extend his EP for Y in the transaction with A, ergo, for Party A, an increase in the cost to C of withstanding A's stress will raise A's power to get Y from B as well as his bargaining power over the terms of settlement.

Many real world interactions can be correlated with this three-party pressure model. All that is necessary, as we shall see in the forthcoming section on intersystem transactions (pp. 107-117), is the actual identity of players involved in the game, their specified goals which order their preference functions toward the goods exchanged, as well as a detailed description of the goods themselves. If this can be successfully accomplished by the observer-analyst, then a logically rigorous conceptual structure is available to measure changes in the overt terms of trade which result from changes in the system states of the players toward the goods exchanged.

In blue-collar Wilkes-Barre, Pa., there is a Daniel J. Flood Elementary school, a Daniel J. Flood Industrial Park, a Daniel J. Flood Rural Health Center and a Daniel J. Flood Elderly Center. All are named in honor of a theatrically flamboyant Representative who struts around Congress like a peacock. "Dapper" Dan Flood has amassed immense power in his 30 years on Capital Hill...he can influence a large share of the federal budget and direct as much as reason permits to his constituents' benefit... He has provided them with millions of dollars' worth of public-works projects over the years, including an interstate highway, hospital and airport....folks back home still revere him for coming to the rescue of Wilkes-Barre after it was virtually destroyed by the raging Susquehanna River during Hurricane Agnes in 1972. After hearing about the disaster at midnight in Washington, he flew home aboard then Secretary of Defense Melvin Laird's personal helicopter, and declared: 'This is going to be one Flood against another'. He soon learned that the most critical need was for helicopters to rescue marooned victims. He phoned a top official at the Pentagon and bellowed: 'I want those helicopters, and I want them this afternoon...there are an awful lot of people

running around looking for stars, but if I don't get help, the only stars they'll see will be the ones in their eyes'... the choppers arrived posthaste...Two days after the storm, in typical bravura fashion, he announced: 'I have ordered the Army Corps of Engineers not to permit the Susquehanna to rise another inch'. The river rose no further. Afterward Flood steered about one billion dollars in disaster relief to his district. No wonder, then, that a constituent described him as 'the next closest thing to God'.

Time/February 20, 1978, p.22.

The Model of Supply And Demand¹³

The classical notion of supply and demand can be described in our model as the uncontrolled interaction of buyers and sellers in which the market terms of trade reflect a transaction consensus. This consensus is arrived at by making the following assumptions:

Assumption 1

Large numbers of A's (buyers) and B's (sellers) exist.

Assumption 2

Each A seeks to provide a homogeneous good (X) to any B in exchange for a homogeneous good (Y).

Assumption 3

Any A is free to deal with any B, and vice versa.

Assumption 4

All A's and B's have complete and accurate information about all EP's.

¹³The reader is referred to Alfred Kuhn's original derivation of supply and demand curves from transactional EP's in Alfred Kuhn, The Study of Society, The Irwin-Dorsey Series in Behavioral Science, (Homewood: Richard D. Irwin and The Dorsey Press, 1963) pp. 570-573; and Alfred Kuhn, Unified Social Science, pp. 350-352.

Assumption 5

The EP's of sellers vary inversely with their variable costs of production.¹⁴

Assumption 6

No coalitions of B's or A's are formed.

Assumption 7

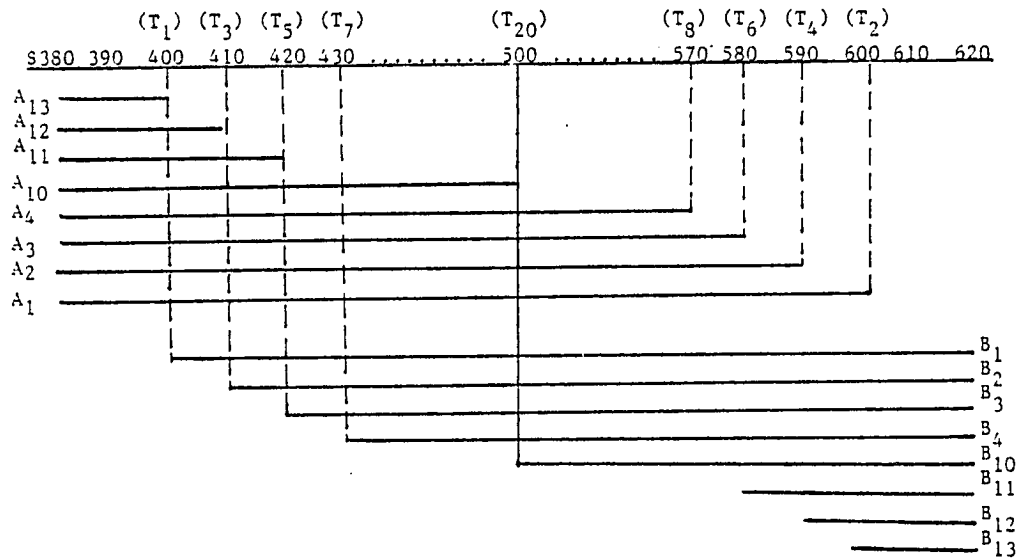
A succession of transactions take place over a specified period of time.

A market consensus is defined as a single exchange ratio between goods X and Y which results from the interaction of a multitude of competing A's and B's. The consensus arises as a result of the external availability of alternative transactions. Once a consensus is achieved no EP for Y by any A will exceed the terms available to any other A, and no EP for X by any B will exceed the terms available to any other B. Any parties whose EP's do not reach these terms will be unable to complete transactions in the market.

¹⁴See footnote #8, p.50.

We will now use the competitive model to demonstrate how a consensus is achieved.

Diagram 18



We begin by looking at only two Parties, A_1 and B_1 , in the above diagram. By Axiom 1 (p. 52), the extent of A_1 's EP at terms T_2 places a ceiling on the bargaining power of B_1 , while the extent of B_1 's EP (T_1) places a ceiling on the bargaining power of A_1 .

As Parties A_2 and B_2 are added, the extent of A_2 's EP at terms T_4 provides the bargaining floor for Parties B_1 and B_2 in dealing with A_1 . It also provides the ceiling on A_1 's bargaining power in dealing with Parties B_1 and B_2 . The extent of B_2 's EP (T_3) provides the bargaining floor for Parties A_1 and A_2 in dealing with B_1 , while it also provides the ceiling on B_1 's bargaining power in dealing with any A.

As Parties A_3 and B_3 are added, the extent of A_3 's EP at terms T_6 provides the bargaining floor for all B's in dealing with A_1 or A_2 . It also provides the ceiling on the bargaining power of Parties A_1 and A_2 in dealing with any B. The extent of B_3 's EP (T_5) provides the bargaining floor for all A's in dealing with B_1 and B_2 , while it also provides the ceiling on the bargaining power of Parties B_1 and B_2 in dealing with any A.

As more parties are added, the market terms of trade converge toward a consensus. As Parties A_{10} and B_{10} are added, the extent of A_{10} 's EP at terms T_{20} provides the bargaining floor for all B's in dealing with any other A. It also provides the ceiling on the bargaining power of any other A in dealing with any, and all, B's. The extent of B_{10} 's EP, also at terms T_{20} , provides the bargaining floor for all A's in dealing with any other B while it also provides the ceiling on the bargaining power of all other B's in dealing with any, and all, A's.

Only at the consensus terms of trade, T_{20} , will the following conditions hold:

- a) The bargaining floor and ceiling for all B's in dealing with any A will be equivalent.
- b) The bargaining floor and ceiling for all A's in dealing with any B will be equivalent.

All A's whose EP's for Y do not extend to terms T_{20} will be unable to complete transactions with any B. All B's whose EP's for X do not extend to terms T_{20} will be unable to complete transactions with any A.

Diagram 19

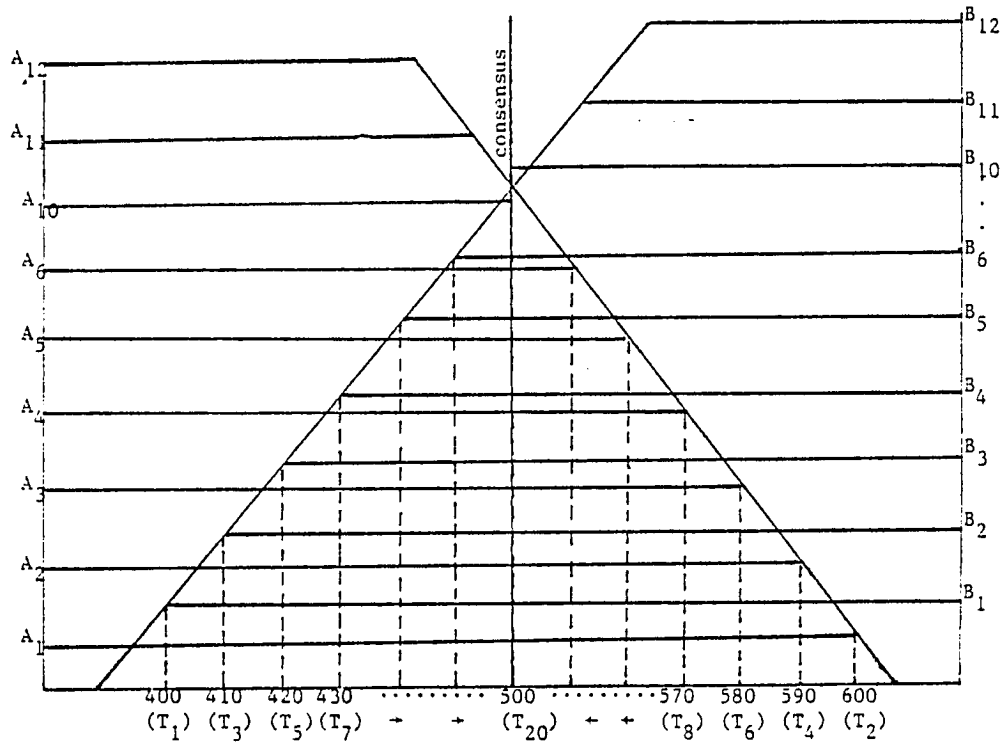
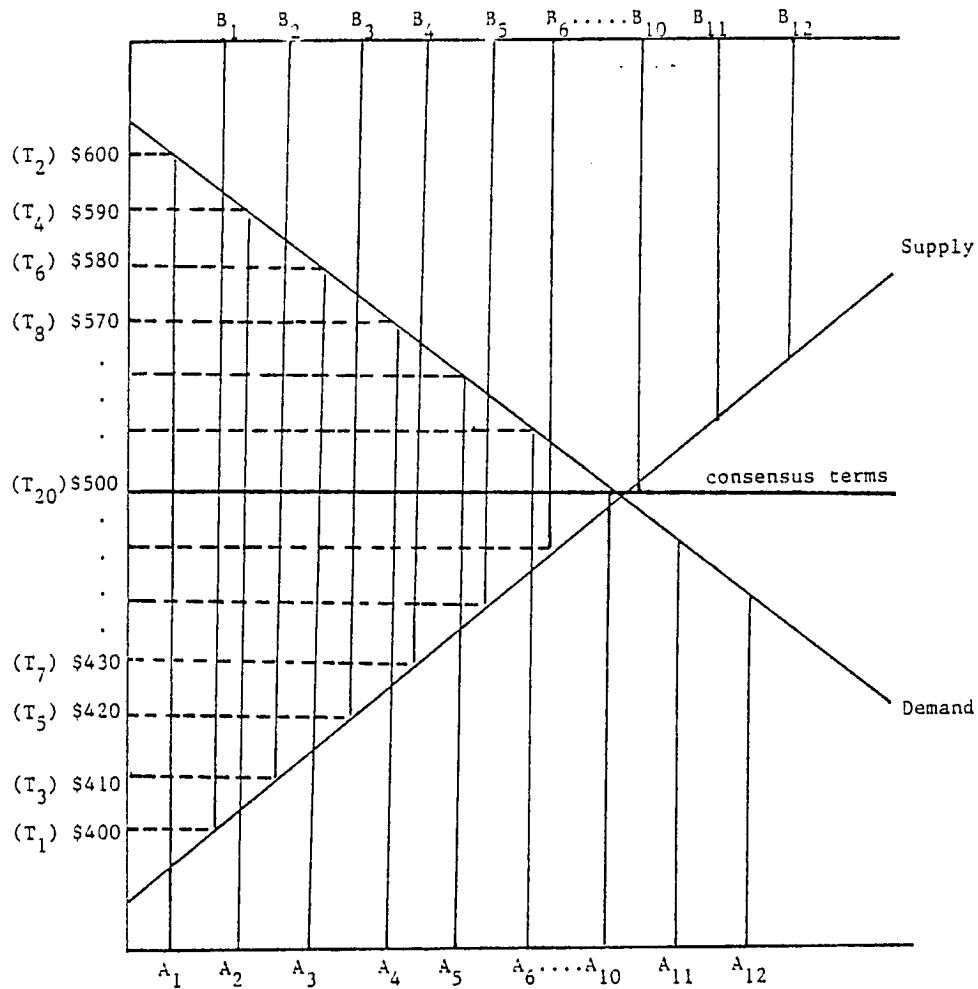


Diagram 19 is the same as our previous diagram except that here we have arranged all of the EP's in an order from shortest to longest. Any A numbered 1 through 10 can buy from any B numbered 1 through 10 at the consensus terms (T_{20}). All A's and B's numbered 11 through 12 would drop out of the market. The interaction will have reached an equilibrium of ten completed transactions at the consensus terms of T_{20} each. Thus the equilibrium quantity of transactions is determined once the consensus terms are achieved. The typical supply and demand diagram in

an economic market can be presented by diagram 20.¹⁵

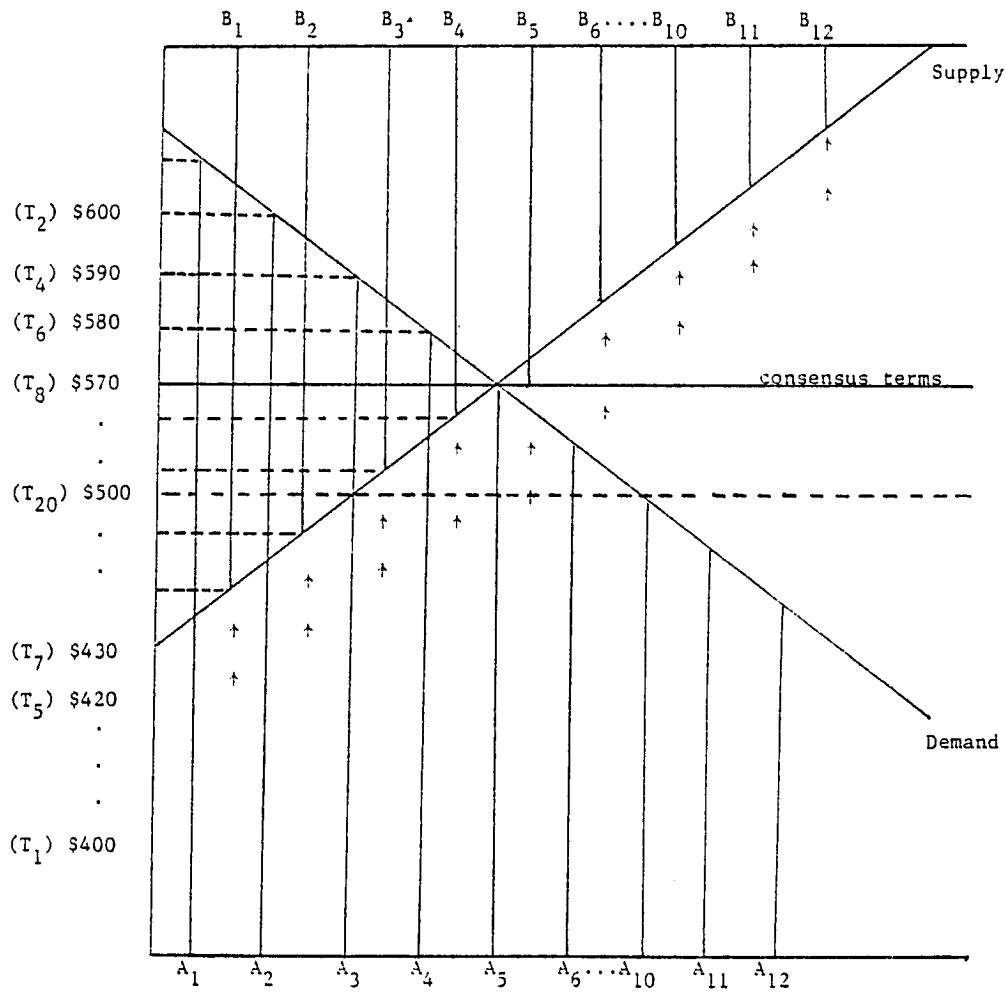
Diagram 20



¹⁵Diagram 20 illustrates the normal slopes of the supply and demand curves in a market of pure competition. Only lower prices will induce buyers to complete greater numbers of transactions with suppliers, while only higher prices will induce suppliers to complete greater numbers of transactions with buyers.

Diagram 21 has been altered to show price on the vertical axis. The tips of the EP's of all B's represent the market supply curve of Y, while the tips of the EP's of all A's represent the market demand for Y. At any set of terms on the vertical axis we can now observe the number of Y's available from B's (effective supply) as well as the number of Y's desired by A's (effective demand) at those terms.

Diagram 21



A cet.par. contraction in the EP's of sellers (as in diagram 21) will change the consensus terms of trade as well as the total number of completed transactions. Specifically, the consensus terms will rise to \$570 (T_8) and the number of completed transactions will fall to five. In addition, the decrease in plain power measured by the decrease in the range of overlap of EP's is itself a measure of decline in the number of completed transactions scaled on the horizontal axis. Theorems 59-62 below predict the direction of change in both the magnitude of transactions and the consensus terms of trade.

Market Transactions as Fixed - Term Transactions¹⁶

Market interactions involving large numbers of buyers and sellers of essentially homogeneous goods or services reflect terms of trade that are not subject to individual manipulation. Each party individually has no bargaining power in the exchange. Buyer A's power to acquire Y at the consensus terms depends on whether his EP is strong enough to justify giving up X in exchange. This is also true for any seller B's power to acquire X.

Fixed-term transactions result from market forces that mold the consensus price. We have demonstrated, however, that a stimulus change in the EP's of a sufficient number of sellers can shift the consensus

¹⁶Fixed-term transactions arise when the terms of exchange are determined by system parameters beyond the influence of any particular buyer or seller in the market (Kuhn, 1963, p.324). Fixed-term exchanges can also arise by government decree or prevailing social norms. Market forces in the circular flow are therefore only one of several ways that a consensus can arise.

terms and can thus affect the bargaining power of all sellers in transactions with all buyers. Thus, a contraction of sufficient magnitude in sellers' EP's for X will alter not only their plain power to complete transactions with buyers, but also their bargaining power as measured by the change in the consensus terms of trade. The following theorems apply to changes in the consensus terms as well as the number of completed transactions between buyers and sellers in the supply and demand model:

Theorem 59

A cet.par., contraction in the EP's of sellers¹⁷ (B's) will raise the consensus terms of trade and reduce the number of completed transactions between A's and B's. This results from the increase in the bargaining power of sellers and the decrease in their plain power with A's as their EP's contract.

Theorem 60

A cet.par., expansion in the EP's of sellers (B's) will lower the consensus terms of trade and raise the number of completed transactions between A's and B's. This results from the decrease in the bargaining power of sellers and the increase in their plain power with A's as their EP's expand.

Theorem 61

A cet.par., contraction in the EP's of buyers (A's) will lower the consensus terms of trade and reduce the number of completed transactions between A's and B's. This results from the increase in the bargaining power of buyers and the decrease in their plain power with B's as their EP's contract.

¹⁷The law of supply in economics reflects increasing marginal costs as output is increased. The EP's of sellers in product market transactions will contract as marginal costs rise, and will expand as marginal costs fall, cet.par. Those sellers that are operating at more efficient scales of plant will have longer EP's (and hence greater plain power) than will those sellers that are less efficient.

Theorem 62

A ceteris paribus, expansion in the EP's of buyers (A's) will raise the consensus terms of trade and raise the number of completed transactions between A's and B's. This results from the decrease in the bargaining power of buyers and the increase in their plain power with B's as their EP's expand.

The Model of Interrelated Transactions

Return to the basic transaction model and relax assumption 3.2.12 (that the transaction is unique) and assume instead that:

Assumption 3.2.12'

Transactions between parties are interrelated such that the terms of one transaction are affected by the actuality or expectation of terms in other transactions with the same or different parties.

Let us define the term "utility" as the satisfaction (positively-valenced selector state) of achieving or acquiring some desired external good.¹⁸ A party's utility for a given dollar is a function of the stock of dollars in his possession. More specifically, we shall suppose that a party's reluctance to part with a given dollar (AX or BY) varies inversely with changes in his stock of dollars (assuming constant prices). By extension, a party's EP in transactions involving dollar outflows is affected by the terms he achieves or expects to achieve in interrelated transactions involving dollar inflows. Under these circumstances the following theorems pertain to all interrelated transactions in our circular flow model:

¹⁸This term is used as it was originally defined by Kuhn, The Logic of Social Systems, p.106.

Theorem 63

Better terms achieved or expected by a party in circular flow transactions involving dollar inflows will expand his EP in interrelated transactions involving dollar outflows.

Theorem 64

Worse terms achieved or expected by a party in circular flow transactions involving dollar inflows will contract his EP in interrelated transactions involving dollar outflows.

This concludes the basic limited-purpose models (LPM's) that we shall employ to examine particular interactions of individuals and formal organizations of individuals who engage in circular flow transactions. We are now ready to specify some types of economic transactions which we include in our circular flow model as well as the main external power factors which mold the EP's of the parties in each.

CHAPTER FIVE - INTERSYSTEM TRANSACTIONS WITH FOREIGN ECONOMIES

Circular Flow Transactions With Foreign Economies

This chapter discusses the interactions that occur between domestic and foreign firms who compete to complete product market transactions with either domestic or foreign consumers. In order to describe interactions of this type, we shall employ our limited-purpose models in varying combinations. Throughout, our concern will be with changes in plain power and bargaining power between parties resulting from changes in exchange rates, relative rates of cost-push inflation, tariff rates, subsidies and customs regulations. Our analysis will proceed after we introduce the general definitions and assumptions of our model.

1.0 General Definitions

The Parties

We shall select for study one representative party from each category. This party is a role occupant whose goals are assumed identical with all other role occupants in the category he represents. Exchange rates, cost changes, and tariff rates are parametric power factors that affect the EP's of all role occupants of a particular category in a similar way. The following definitions make explicit the separate roles and goals of each of our representative parties.

- 1.1 Party A is the domestic (U.S.) consumer who seeks to purchase good Y from Parties B or C by providing currency (Good X) in exchange.
- 1.2 Party B is the domestic producer of good Y who seeks to provide it to Parties A or D in exchange for good X.
- 1.3 Party C is the foreign producer of good Y who also seeks to provide Y to A or D in exchange for good X.
- 1.4 Party D is the foreign consumer who seeks to purchase good Y from Parties B or C by providing good X in exchange.

- 1.5 The exchange rate, p , is measured in the domestic (U.S.) market as "units of foreign currency per dollar ($f/\$$)". In the foreign market the exchange rate is measured in "units of dollars per foreign currency ($\$/f$), or $1/p$ ".
- 1.6 Tariffs are defined as taxes which are added to each unit of Y 's supplied from abroad by the foreign producer.

2.0 General Assumptions

- 2.1 Theorems 23 - 28 of the competitive model are assumed operative in this chapter on intersystem interactions.
- 2.2 The transaction process has no costs or benefits to any party other than the sacrifice of Y for X and vice versa.
- 2.3 All transportation costs are assumed zero for purposes of our present analysis. If such costs were included, the EP's of the foreign producers would contract by the amount of these costs, thereby affecting the plain power and bargaining power forces in a predictable manner.
- 2.4 Currency values in the market for foreign exchange are assumed to fluctuate with changes in the EP's of currency traders, i.e., in accordance with shifts in supply and demand for currency.
- 2.5 Consumer EP's (both domestic and foreign) are assumed to vary with changes in incomes and exchange rates.
- 2.6 Producer EP's (both domestic and foreign) are assumed to vary with changes in production costs and exchange rates. Cost changes vary with changes in productivity, factor prices, subsidies, or tariffs. This assumption follows the traditional economic approach to decision-making for the firm, whose sponsor's motives are purely selfish-indifferent in product market transactions with both foreign and domestic consumers.

3.0 Power Factors

- 3.1 Party A's EP for Y reflects its net preference for Y in terms of the amount of X 's it is willing and able to provide to B or C . A's EP for good Y is determined by the difference between AY and AX in transactions with either B or C .
- 3.2 Party B's EP for X reflects its net preference for X in terms of the amount of good Y it is willing and able to provide to Party A or D in return for good X . B's EP for X is determined by the difference between BX and BY in transactions with either A or D .

- 3.3 Party C's EP for X reflects its net preference for X in terms of the amount of good Y it is willing and able to provide to Party A or D in return for X. C's EP for X is determined by the difference between CX and CY in transactions with either A or D.
- 3.4 Party D's EP for Y reflects its net preference for Y in terms of the amount of X's it is willing and able to provide to B or C. D's EP for good Y is determined by the difference between DY and DX in transactions with either B or C.

Under the above circumstances we may now state the following observations we shall employ later in our discussion of the circular flow as a social organization. Unless otherwise specified, the EP's of both domestic and foreign producers will be of equal length, a neutral point from which our logical analysis will proceed.

Exchange Rate Effects on Intersystem Transactions

The exchange rate is the consensus terms of completed transactions in the market for foreign exchange. It is the price of one currency in terms of another. It acts as an external power factor in determining the plain power and bargaining power of parties who complete intersystem transactions in our model. The theorem observations¹ below describe the

¹Intersystem transactions between subsystem parties in this circular flow model can be categorized within limited-purpose models for which theorems have been well specified. The limited-purpose models are entirely nomothetic; and X's and Y's, as well as the identity of the parties are completely general. Once we use these models to describe particular interaction patterns in the circular flow model (or, for that matter, to particular interactions in any of the other social science disciplines) we arrive at certain deduced conclusions about the power and bargaining power forces that mold the outcome of the interaction. These conclusions are not "theorems", but are merely "observations" reached when we match a particular interaction with the appropriate mix of LPM's that best describe it. This is the rationale for the term "theorem observation".

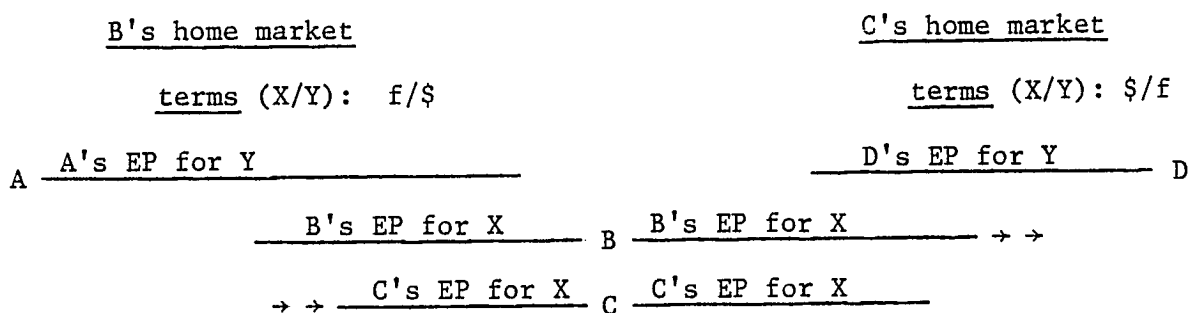
effects of changes in the exchange rate on the EP's (and power positions) of the parties.

Theorem Observation 1

A decline in the exchange rate (p), *cet.par.*, will raise the plain power and bargaining power of D in transactions with B in C's home market, while it will reduce the plain power and bargaining power of A in transactions with C in B's home market.

The following diagrams reflect an exchange of good Y for dollars in B's home market, and an exchange of good Y for foreign currency in the foreign market. Better terms for consumers reflect more of good Y per unit of currency, while better terms for producers reflect more currency per unit of good Y.

Diagram 22



Explanation

As the exchange rate decreases, *cet.par.*, domestic goods and services sold abroad become relatively cheaper there while goods sold domestically become relatively more expensive. Domestic producers are enabled to provide better terms to foreign consumers as reflected by the extension of B's EP in C's home market equal to the magnitude of change in the exchange rate. Likewise, domestic consumers (A's) receive worse terms from foreign producers, as evidenced by the contraction of C's EP in B's home market equal to the exchange rate decline. As these changes in EP's occur, theorems 24 and 25, pp.54 &55,

can be applied to confirm Theorem Observation 1. To generalize, falling exchange rates, *cet.par.*, can be expected to have the following effects:

1. The Domestic Market

The rise in C's price, *cet.par.*, is induced by the falling exchange rate. This will bring about both a substitution and an income effect as consumer A's make optimum adjustments in their consumption patterns. There will be a shift in market demand from the Y's provided by C to the substitute Y's provided by B as illustrated in diagrams 9a and 9b, p.55. Sales and profits will rise for Party B and will decline for Party C.

2. The Foreign Market

The decline in B's price, *cet.par.*, is also induced by the falling exchange rate. Consumer D's will adjust their consumption patterns and there will occur a shift in market demand from the Y's provided by C to the substitute Y's provided by B as illustrated in diagrams 8a and 8b, p.54. Sales and profits will rise for Party B and will decline for Party C.

For those A's who travel abroad, a falling exchange rate constitutes a decrease in their real incomes. Their EP's will contract for the Y's of B and C, and market demand will decrease at constant prices, as illustrated in diagrams 12a and 12b, p. 58.

For those D's who travel abroad, a falling exchange rate constitutes an increase in their real incomes. Their EP's will expand for the Y's of B and C, and market demand will increase at constant prices, as illustrated in diagrams 11a and 11b, p. 57.

"When the sharp decline of the dollar began...most Americans figured that the only major victims would be tourists...Now the greenback's sickness is infecting all Americans. Foreign sellers are increasing their prices to compensate for the dollar's fall, and some U.S. manufacturers of competitive products have felt freer to follow through with price rises of their own...Toyota, Datsun and Volkswagen all raised prices last month by 3.9% to 5.4%; about the same time, Ford Motor Co. lifted prices on

three of its smaller models. Indeed, major foreign carmakers have raised prices five or six times during the past year, making it easier for Detroit to post increases."

Time/May 15, 1978, p.74.

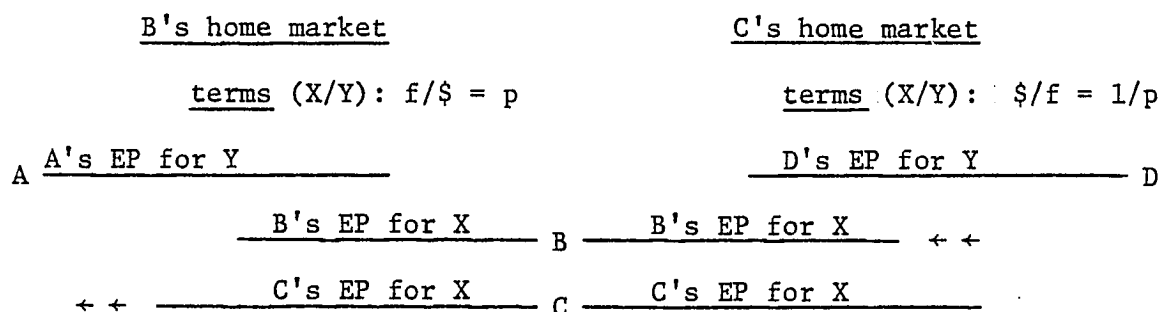
"The devaluing of the dollar has lured many foreigners to U.S. hotels. A record 2 million people from abroad visited New York City last year, an increase of 8% over 1977. Says a manager at the chic Beverly Wilshire Hotel, where foreign guests have risen from 10% of the clientele ten years ago to close to 25% now: 'We are getting so many Australians that I call one hallway my Australia Row'."

Time/January 22, 1979, p.60.

Theorem Observation 2

An increase in the exchange rate (p), *cet.par.*, will reduce the plain power and bargaining power of D in transactions with B in C's home market, while it will raise the plain power and bargaining power of A in transactions with C in B's home market.

Diagram 23



Explanation

As the exchange rate increases, *cet.par.*, domestic goods and services sold abroad become relatively more expensive there while foreign goods sold domestically become relatively less expensive. Foreign producers are enabled to provide better terms to domestic consumers as reflected by the extension of C's EP in B's home market equal to the magnitude of change in the exchange rate. Likewise, foreign consumers (D's) receive worse terms from domestic producers,

as reflected by the contraction of B's EP in C's home market equal to the magnitude of change in the exchange rate. As these changes in EP's occur, theorems 23 and 26, pp. 53 and 56, can be applied to confirm the validity of theorem observation 2. Rising exchange rates, cet.par., can be expected to have the following market effects:

1. The Domestic Market

The decline in C's price, cet.par., is induced by the rising exchange rate. This will bring about a shift in market demand for the Y's provided by B and C as consumers (A's) make optimal adjustments in their consumption patterns. With the decline in C's price relative to B, market demand for B's good will decline as illustrated in diagrams 10a and 10b, p.56.

2. The Foreign Market

The rise in B's price, cet.par., is also induced by the rising exchange rate. Consumer D's will shift their demand to the Y's of C, as illustrated in diagrams 7a and 7b, p. 53. Sales and profits will rise for Party C and will fall for Party B.

For those A's who travel abroad, a rising exchange rate constitutes an increase in their real incomes. Their EP's will expand for the Y's of B and C, and market demand will increase for both at constant prices, as illustrated in diagrams 11a and 11b, p.57. Sales and profits for B and C will rise.

For those D's who travel abroad, a rising exchange rate constitutes a decrease in their real incomes. Their EP's will contract for the Y's of B and C, and market demand will decrease for both at constant prices, as illustrated in diagrams 12a and 12b, p. 58. This will tend to reduce sales and profits for B and C.

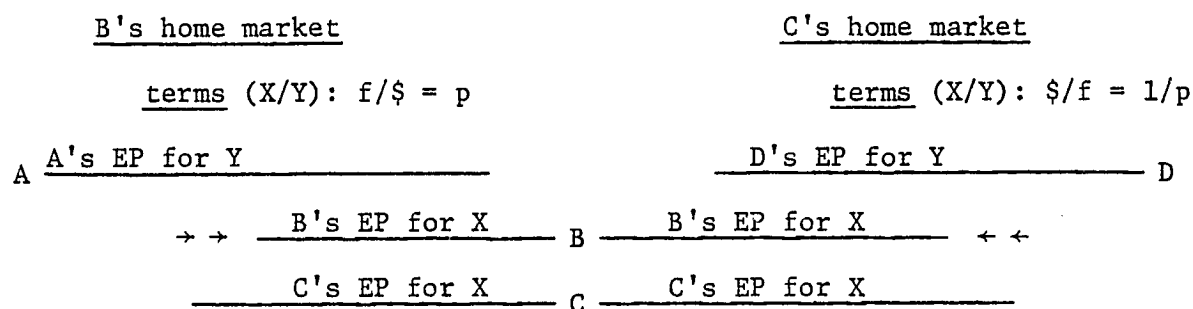
Cost-push Inflation Effects on Intersystem Transactions

In addition to the exchange rate, the rate of inflation is an external power factor which affects the competitive climate of parties in foreign and domestic product market transactions. Let us assume that exchange rates remain constant, but that a difference arises in the relative inflation rate between economies. How will this difference affect the plain power and bargaining power forces (EP's) of the parties?

Theorem Observation 3

An increase in the rate of factor price increases for Party B relative to Party C, cet.par., will reduce B's plain power but raise B's bargaining power in product market transactions with A's and D's both at home and abroad, while it raises the plain power and bargaining power of Party C in both markets.

Diagram 24



Explanation

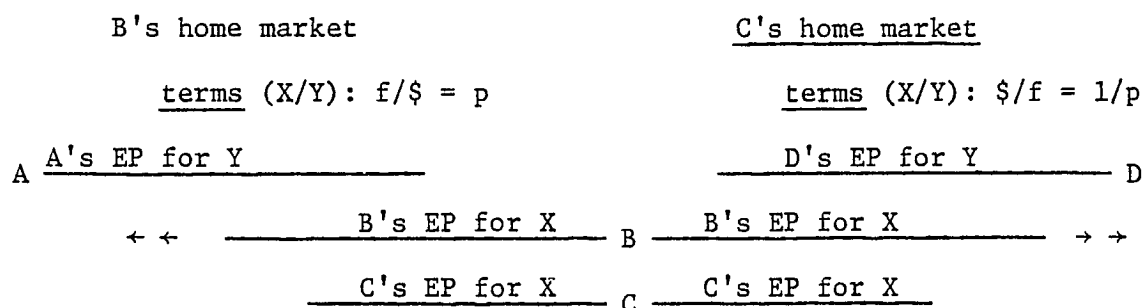
As the inflation rate rises in B's economy relative to C's, domestically produced goods and services will become relatively more expensive both at home and abroad (due to relative factor price increases). Party B's EP will contract relative to Party C's EP in both markets at home and abroad. As these changes occur, theorem 23, p. 53, can be applied to confirm theorem observation 3. Higher relative

rates of inflation in B's market, cet.par., will induce a demand shift from B's product to C's product in both the domestic and foreign market. Party B's sales and profits will decrease in both markets, while the sales and profits of Party C will rise in both, as illustrated in diagrams 7a and 7b, p. 53.

Theorem Observation 4

A decline in the rate of factor price increases for Party B relative to Party C, cet.par., will raise B's plain power and reduce his bargaining power in product market transactions with A and D both at home and abroad, while it reduces the plain power and bargaining power of Party C in both markets.

Diagram 25



Explanation

As the inflation rate falls in B's resource market relative to C's, domestically produced goods and services will become relatively less expensive both at home and abroad (due to relative factor price decreases). Party B's EP will expand relative to Party C's EP in both markets at home and abroad. As these changes occur, theorem 24, p. 54, can be applied to confirm theorem observation 5. Consumer A's and D's will optimally adjust their consumption patterns, and a demand shift will occur from C's product to B's product in both the domestic and foreign market. Party B's sales and profits will increase in both markets, while the

sales and profits of Party C will fall in both, as illustrated in diagrams 8a and 8b, p. 54.

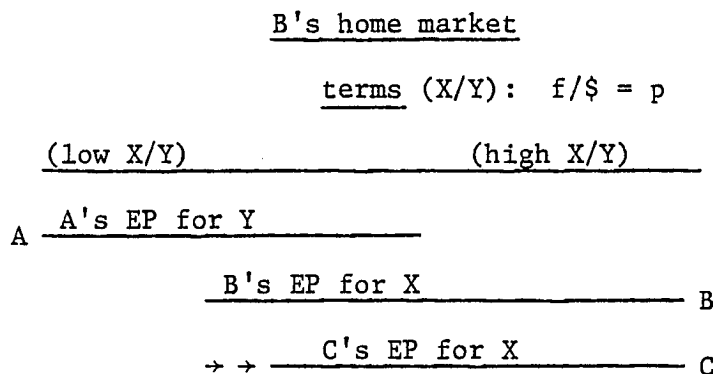
Tariff Effects on Intersystem Transactions

An important means by which government can alter the plain power and the bargaining power balances between domestic and foreign producers is through the imposition of a tariff on imports. It is also an important means by which the government can control the amount of currency inflows and outflows resulting from intersystem product market transactions. The following theorems pertain to the tariff's effects on the power factors affecting the volume and terms of trade in intersystem transactions.

Theorem Observation 5

A tariff increase by B's government on the Y's provided by Party C will raise the plain power and the bargaining power of Party B in domestic product market transactions with Party A. It will also reduce the plain power and the bargaining power of Party A in domestic product market transactions with Party C.

Diagram 26



Explanation

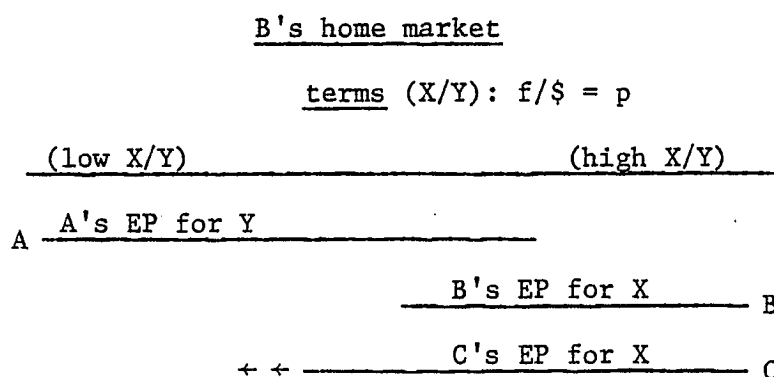
A tariff increase on C's product adds to C's cost of providing Y

to A. C's EP will contract by the amount of the tariff increase. As these changes occur, theorem 25, p. 55, can be applied to confirm the validity of theorem observation 5. The tariff is viewed as all cost to Parties A and C. Party A receives worse terms from Party C and no better terms from B, while Party C's competitive strength is weakened in B's home market by the amount of the tariff. The tariff increase is viewed as all benefit by B since its plain power and bargaining power in transactions with A are increased in proportion to the size of the tariff. We would therefore expect to see a decrease in the quantity demanded of C's product and an increase in demand for the product of Party B. C's sales and profits will decrease while B's sales and profits will increase, as illustrated in diagrams 9a and 9b, p. 55. With the appropriate substitution of symbols, similar deductions can also be made for a tariff increase on B's product in C's home market.

Theorem Observation 6

A tariff reduction by B's government on the Y's provided by Party C will decrease the plain power and the bargaining power of Party B in domestic product market transactions with Party A. It will also raise the plain power and the bargaining power of Party A in domestic product market transactions with Party C.

Diagram 27

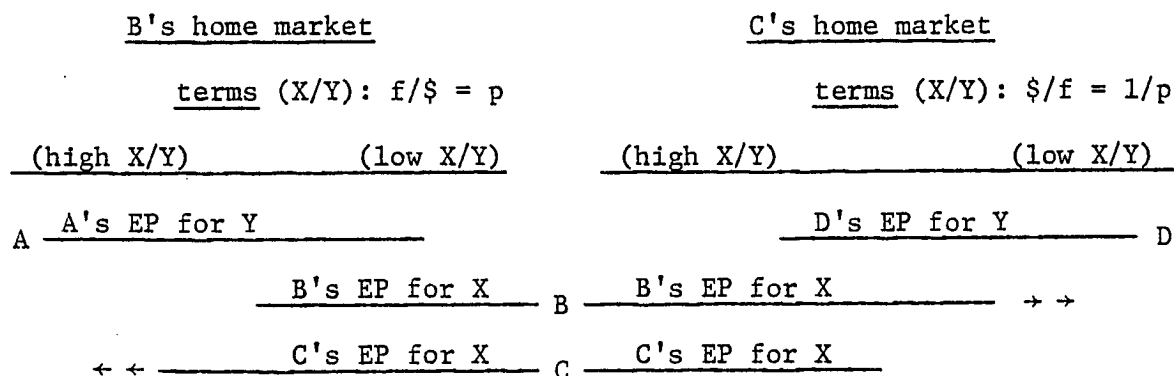


Explanation

A tariff decrease on C's product reduces C's cost of providing Y to A. C's EP will expand, *cet.par.*, and theorem 26, p. 56, can then be applied to confirm the validity of theorem observation 6. The tariff decrease is viewed as all cost to Party B as it induces an increase in the quantity demanded of C's product and a decrease in demand for his own, as illustrated in diagrams 10a and 10b, p. 56. We would therefore expect C's sales and profits to increase and B's sales and profits to decrease. With the appropriate substitution of symbols, similar deductions can also be made for a tariff decrease on B's product in C's home market.

Theorem Observation 7

A mutual reduction of tariffs by the governments of producers B and C will make B a stronger competitor in C's home market and will make C a stronger competitor in B's home market. The tariff reductions will also raise A's plain power to complete product market transactions with C as well as raise D's plain power to complete product market transactions with B.

Diagram 28Explanation

At the intrasystem level of analysis, a mutual reduction of tariffs

would allow Party C to extend better terms to A in B's home market, while it would allow Party B to extend better terms to D in C's home market. As these changes in EP's occur, theorems 24 and 26, pp. 54 and 56, can be applied at the intersystem level to confirm the validity of theorem observation 7. The mutual tariff reduction is viewed as both cost and benefit to Parties B and C. B's power to complete product market transactions with Party D increases, and its power to complete transactions with A decreases. C's power to complete transactions with Party A increases, but its power to complete transactions with D decreases. The mutual tariff reduction is viewed as all benefit to Parties D and A as each receives better terms from the foreign competitor. Viewed at the holistic main-system level, a mutual reduction in tariffs can lower the rate of inflation and raise employment in B's home market if B's enhanced power to get X's from D's adds to its stock of X's more than B's reduced power to get X's from A's subtracts from it. We would therefore expect C's sales and profits to increase and B's sales and profits to decrease in B's home market (diagrams 10a and 10b, p. 56). We would also expect B's sales and profits to increase and C's sales and profits to decrease in C's home market, as illustrated in diagrams 8a and 8b, p. 54. Market prices of the goods provided by both B and C will fall in both markets.

" What does the recently completed Tokyo Round of trade agreements have to do with inflation? According to experts, free trade among nations is one of the few ways left to reduce prices without losing jobs.

Trade agreements recently initialed in Geneva by 40 countries will reduce tariff barriers and therefore prices on nearly 90 percent of the manufactured goods entering this country...At the same time the new trade

treaty is lowering prices on consumer goods it will also help to create new jobs.

An increase in export-related employment should bring openings in entry level jobs, expanded training opportunities and more stable work conditions.

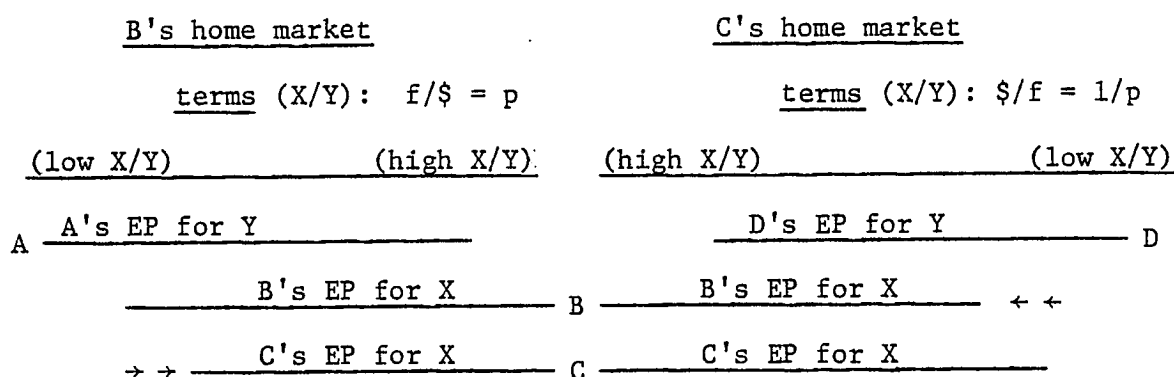
In short, free trade should contribute to the controlled expansion of the economy necessary for slowing down inflation and help substantially to maintain a desirable unemployment reduction rate."

Union County Review, June 5, 1979

Theorem Observation 8

Retaliatory tariff increases by the governments of producers B and C will raise the plain power and bargaining power of the domestic producer in the domestic market, and will reduce the plain power but increase the bargaining power of the domestic producer in the foreign market.

Diagram 29



Explanation

At the intrasystem level of analysis, a retaliatory tariff increase by the governments of B and C would add to each producer's costs of production and contract his EP in transactions with consumers in the foreign product market. As these changes occur, theorems 23 and 25, pp. 53 and 55, can be applied at the intersystem level to confirm the validity of theorem observation 8. The retaliatory tariff increase is viewed as both cost and benefit to Parties B and C. B's power and bargaining power increase in product market transactions with Party A,

while C's power and bargaining power increase in product market transactions with Party D. Each party's power to complete transactions with consumers in the foreign market is reduced. The retaliatory tariff increase is viewed as all cost to Parties A and D as each receives worse terms from the foreign competitor. We would therefore expect to see a decrease in sales and profits for Party B and an increase in sales and profits for Party C in C's home market (diagrams 7a and 7b, p 53). Party B's sales and profits will increase and C's will decrease in B's home market (diagrams 9a and 9b, p. 55).

Export Subsidy Effects on Intersystem Transactions

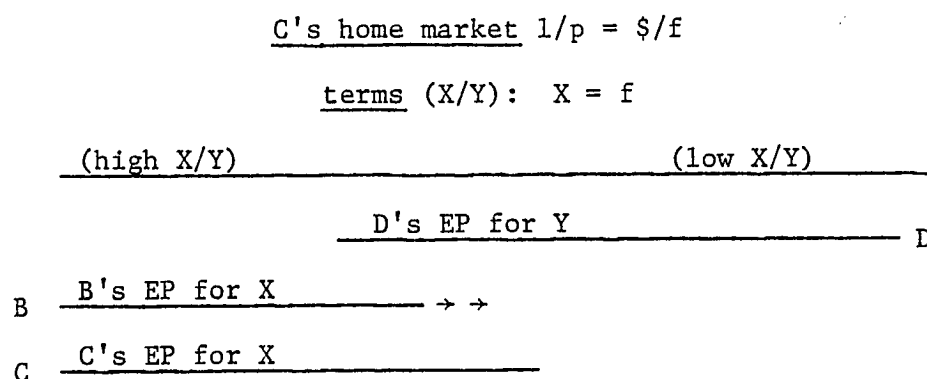
Protective tariffs limit the power of foreign producers to complete product market transactions with domestic consumers. Export subsidies, on the other hand, raise the power of domestic producers to complete product market transactions with foreign consumers in foreign markets. At the functionalist level of analysis, the government and Party B would organize a plain power coalition whose goal is to enable Party B to become a stronger competitor in C's market. At a reductionist-intrasystem level of analysis, a subsidy granted to Party B by B's government reduces marginal production costs, and enables B to extend better terms in transactions with foreign consumers than those that would exist without the subsidy. At the reductionist-intersystem level, such an extension of B's EP in transactions with D will have a predictable effect on the plain power and bargaining power forces inherent in the competitive interaction between Parties B, C, and D. The following

theorem observations pertain to the subsidy's effects on the power factors affecting the volume and terms of trade in intersystem transactions.

Theorem Observation 9

Export subsidies provided to Party B by B's government help to reduce the plain power and bargaining power of Party C in product market transactions with Party D. The subsidy will also raise the plain power and bargaining power of Party D in transactions with Party B.

Diagram 30



Explanation

Viewed at the intrasystem level, a subsidy reduces B's cost of providing Y to D. B's EP will expand in product market transactions with D. At the intersystem level, such an expansion will allow the analyst to apply theorem 24, p. 54, to confirm the validity of theorem observation 9. The export subsidy is viewed as all cost to Party C as its competitive strength is weakened in its home market. The subsidy is viewed as all benefit to Parties B and D. D receives better terms from B and no worse terms from C. Party B's sales and profits will increase while sales and profits of C will decrease (8a and 8b, p.54).

The withdrawal of an existing export subsidy on the good Y that Party B provides to Party D in C's home market will induce a contraction

of B's EP. Such a contraction of B's EP is viewed as all cost to Parties B and D. Party D now receives worse terms from B and no better terms from C. Party B loses competitive strength in C's market, while Party C's power and bargaining power in transactions with D are both increased.

With the appropriate substitutions of symbols, similar deductions can also be made for the provision and withdrawal of export subsidies by C's government on the good Y that Party C provides to Party A in B's home market.

Expectations and Bargaining Power in Exchange Rate Transactions

Exchange rate changes not only affect the terms of trade of all intersystem economic transactions, they also communicate a developmental change in the system states of currency traders toward the currencies exchanged. To investigate the logic of such change, we must add two additional parties to our model, and state the role and goal of each.

Additional Definitions (contd. from p.86)

- 1.5 Party F is the party who seeks to supply foreign currency in exchange for dollars.
- 1.6 Party G is the party who seeks to supply dollars in exchange for foreign currency.
- 1.7 Good V represents dollars provided by Party G.
- 1.8 Good Z represents foreign currency provided by Party F.

Additional Power Factors (contd. from p.88)

- 3.5 Party F's EP for V reflects its net preference for V in terms of the amount of Z it is willing and able to provide to Party G in exchange for V. Party F's EP for good V is determined by the difference between FV and FZ in transactions with Party G.

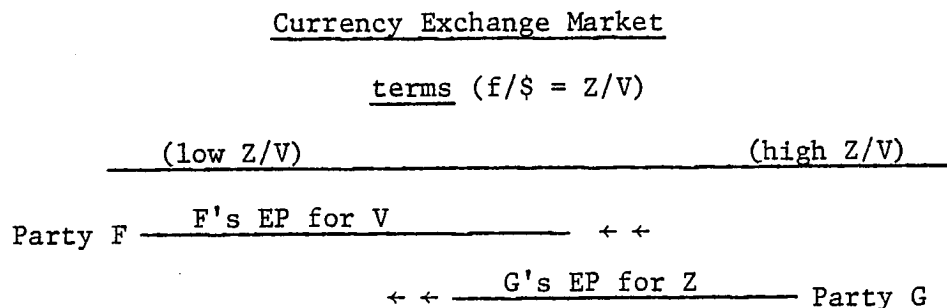
3.6 Party G's EP for Z reflects its net preference for Z in terms of the amount of V it is willing and able to provide to Party F in exchange for Z. Party G's EP for Z is determined by the difference between GZ and GV in transactions with Party F.

Under the above conditions we may now state the following theorem observations concerning expected changes in the exchange rate. The terms of trade will be measured in units of foreign currency per dollar, or (Z/V).

Theorem Observation 10

An actual or expected decrease in the relative value of the dollar on the currency exchange market, cet.par., will decrease the bargaining power of holders of dollars (G's) and increase the bargaining power of holders of foreign currency (F's) in currency market transactions involving dollars.

Diagram 31



Explanation

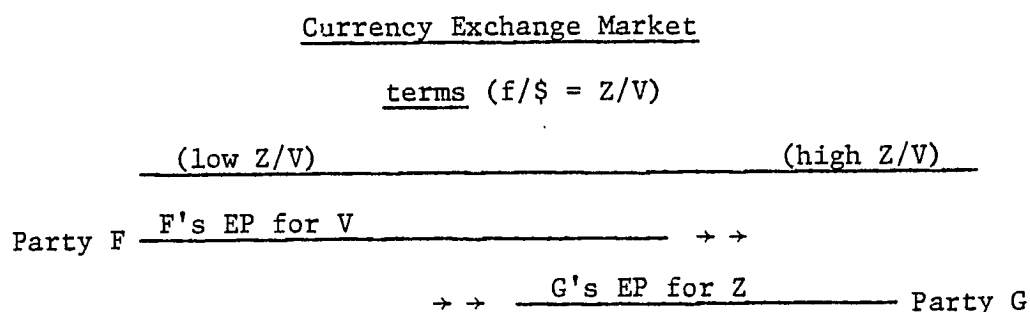
A decline in the exchange rate means that the dollar is falling in value relative to the value of foreign currency. The dollar therefore becomes a less desirable store of value for both Parties G and F. At the intrasystem level, the relative decline in the value of the dollar reduces GV (G's desire not to trade dollars for foreign currency) and raises FZ (F's desire not to trade foreign currency for dollars). At the intersystem level, the fall in GV extends G's EP for V while the

rise in FZ contracts F's EP for Z. If expectations are widespread, we can apply theorems 60 and 61, p. 83, to confirm the validity of theorem observation 10. Expectations of this type are subject to positive feedback in that confirming messages of a falling relative value of the dollar lead to a reduced desire for it by traders in the market, which then helps confirm expectations that its relative value will fall further in the future. Such expectations will persist until reversed by random events or by government policy.

Theorem Observation 11

An actual or expected increase in the relative value of the dollar on the currency exchange market, cet.par., will increase the bargaining power of holders of dollars (G's) and decrease the bargaining power of holders of foreign currency (F's) in currency market transactions involving dollars.

Diagram 32



Explanation

An increase in the exchange rate (p) means that the dollar is rising in value relative to the value of foreign currency. The dollar therefore becomes more desirable as a store of value for both Parties G and F. At the intrasystem level, the relative rise in the dollar's value increases GV (G's desire not to trade dollars for foreign currency) and reduces FZ (F's desire not to trade foreign currency for dollars).

At the intersystem level, the increase in GV contracts G's EP for V, while the fall in FZ extends F's EP for Z. If expectations of a rising dollar are widespread, we can apply theorems 59 and 62, pp. 83 and 84, to confirm the validity of theorem observation 11 (we implicitly assume that Party G's are 'sellers' of dollars and Party F's are 'buyers' of dollars). Expected increases in the dollar's relative value and its actual rise are subject to positive feedback in that confirming messages of a rising relative value of the dollar lead to an increased desire for it by traders in the market. An enhanced desire for the dollar raises its market price which helps confirm expectations that it will rise further in the future. Again, such expectations may persist until reversed by random events or by government policy.

The following chart summarizes the principle economic events and their respective effects on the intersystem transactions discussed in this chapter. Each of these events is viewed as a cost or benefit to each of the parties listed in the interaction. For example, a tariff reduction by C's government on the Y's provided by B to consumer D's in C's home market is seen as all cost to Party C who will stand to lose sales and profits. Party C may be willing to avoid this cost by providing wanted goods to its government to insure such an event does not occur. This point will be discussed in greater detail in the complex interaction, pp.107-117.

<u>EVENT</u> benefit (+) cost (-) not applicable (NA)	DOMESTIC CONSUMER (A)	DOMESTIC PRODUCER (B)	FOREIGN PRODUCER (C)	FOREIGN CONSUMER (D)
1. Rising U.S. exchange rates (p) relative to foreign currencies (Theorem observation 2, p.91)	+	-	+	-
2. Falling U.S. exchange rates (p) relative to foreign currencies (Theorem observation 1, p.89)	-	+	-	+
3. Rising U.S. inflation rates relative to foreign economies (Theorem observation 3, p.93)	-	-	+	+
4. Falling U.S. inflation rates relative to foreign economies (Theorem observation 4, p.94)	+	+	-	-
5. Tariff increases on C's product sold in B's home market (Theorem observation 5, p.95)	-	+	-	NA
6. Tariff reductions on C's pro- duct sold in B's home market (Theorem observation 6, p.96)	+	-	+	NA
7. Tariff increases on B's pro- duct sold in C's home market (Theorem observation 5, p.95)	NA	-	+	-
8. Tariff reductions on B's pro- duct sold in C's home market (Theorem observation 6, p.96)	NA	+	-	+
9. Subsidy provision by C's govt. on C's product sold to A in B's home market (Theorem observa- tion 9, p.101)	+	-	+	NA
10. Subsidy withdrawal by C's govt. on C's product sold to A in B's home market (Theorem observation 9, p. 101)	-	+	-	NA
11. Subsidy provision by B's govt. on B's product sold to D in C's home market (Theorem observation 9, p.101)	NA	+	-	+
12. Subsidy withdrawal by B's govt. on B's product sold to D in C's home market (Theorem observa- tion 9, p.101)	NA	-	+	-

Import Quotas and Customs Procedures

Import quotas and customs procedures are other means employed by sponsors of government to reduce the power of foreign producers to complete transactions with domestic consumers. Import quotas limit the quantity of completed transactions to some specified amount less than the free trade level, while customs procedures increase the costs to the producer of selling into another market. Both policies are instrumental in reducing currency outflows at the main system level by restricting the domestic consumer's power to get Y and the foreign producer's power to get X.

"...Japan throws up a bristling array of barriers to stop manufactured imports. To get a new car model past customs, a U.S. manufacturer must supply 400 to 500 pages of technical data. In addition, every car that enters the market must have the rear seats changed and headrests added, plastic floor covering installed, wheels rebalanced, fender mirrors attached, paint and finish work touched up. All this adds a markup, kicking the overall price of an auto skyward. For a Ford Mustang 2800cc Ghia that sells in the U.S. for \$4,920, the Japanese buyer must pay \$15,000. Small wonder that from January to August last year the U.S. exported only 7,900 cars to Japan, while the Japanese spewed 1.3 million autos into the U.S."

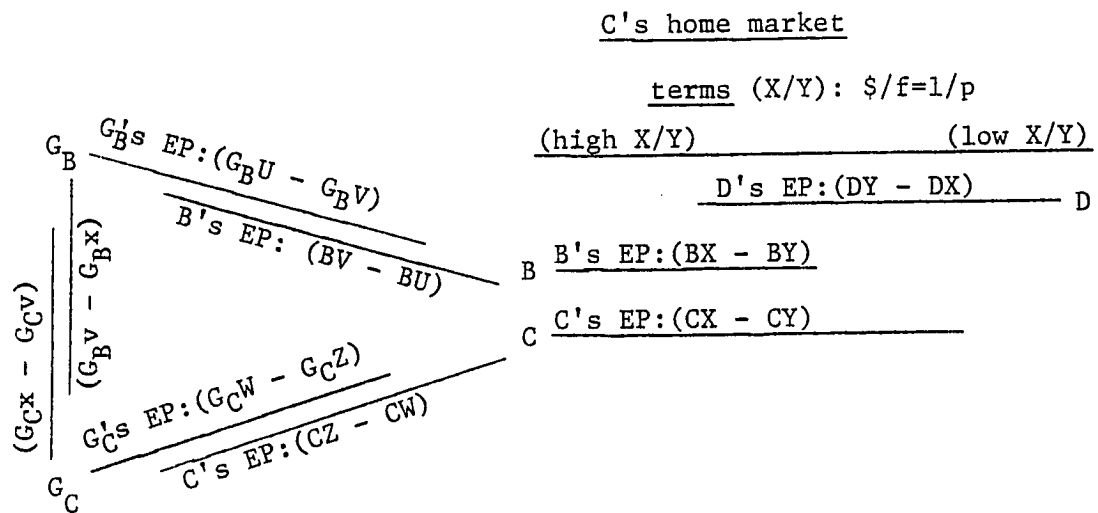
Time, May 14, 1979

Complex Intersystem Interactions: Cross-sectional Analysis

The analysis of the following complex interaction consists entirely of the principles developed in this paper and is constructed with the basic tools of social system analysis. The interaction concerns the

removal of trade barriers and is therefore considered relevant to this section on intersystem transactions between members of separate economic systems. The analysis will first deal with nomothetic principles about power and bargaining power before the interaction's idiographic counterpart is introduced. The following diagram, definitions and assumptions list the boundaries of the interaction, and specify the DSE and interactional role traits of its component subsystems.

Diagram 33



Overview

This interaction concerns B's attempts to raise its power to acquire X's from D's in C's home market by employing G_B (top staff of B's government) to successfully negotiate a reduction in trade barriers that raises B's plain power in product market transactions with D's. At the intrasystem level of analysis, a reduction in trade barriers on the Y's provided by B in C's home market would enable the B's to extend better terms to D's. Such an event has direct benefit for B's, and



direct costs for C's, who, at the intersystem level, would lose both plain and bargaining power in transactions with D's as a result. The goals of B's and C's are in direct conflict concerning trade restrictions in that better terms for one party mean worse terms for the other. Party C's therefore apply pressure to G_C to raise C_c 's concession costs in its negotiations with G_B in an attempt to decrease B's power to complete product market transactions with D's in C's home market.

Main Assumptions

1. There are five parties involved in this interaction; C, B, D, G_C , and G_B .
2. A party consists of a player, or a formal organization of players.
3. Each party makes rational decisions as a unit. Intraorganizational decisions are assumed to be arrived at through communication, transaction, dominant coalition, or some combination thereof.
4. Parties B and C are strict competitors who supply essentially substitute Y's to D's in C's home market. The limited-purpose competitive model is assumed applicable to the reductionist-intersystem interaction between Parties B, C, and D.
5. The interaction involving all parties is analyzed at the holistic-intrasystem level as an informal organization of interacting subsystems. The outcome of the interaction results directly from the interactions of the parties and is wholly uncontrolled at the main system level.
6. The trade restrictions in question are considered the "rules of the game". The interaction under investigation is centered around B's attempts to alter these game rules in ways that will raise its competitive strength relative to Party C in intersystem product market transactions with Party D in C's home market.
7. The Y's provided by Parties B and C are normal substitute goods. The substitution effect predominates the income effect with respect to a change in relative price of the Y's provided by B and C.

Main Definitions

1. Party C: a formal pressure organization of Player C's (foreign producers) who seek to apply pressure to G_C in an attempt to maintain their power position relative to Party B in dealing with Party D's in the home market.

2. Party G_C : the top staff of C's government through which negotiations with G_B are conducted.
3. Party G_B : the top staff of B's government through which negotiations with G_C are conducted.
4. Party B : a formal pressure organization of Player B's (domestic producers) who seek to exert pressure on G_C through G_B in an attempt to raise their power to complete product market transactions with D's in C's home market.
5. Party D: the foreign consumer in C's home market.
6. Good X: currency units provided by Party D's in exchange for good Y.
7. Good Y: a good or service provided by Parties B or C to Party D's in exchange for good X.
8. Good V represents trade barrier reductions on the Y's provided by Party B in product market transactions with D's in C's home market.
9. Good U represents the value to G_B of the relieved stress or threat in the pressure transaction with Party B.
10. Good v represents wanted trade concessions made by G_C on the Y's provided by Party B in product market transactions with D's in C's home market.
11. Good x represents the value to G_C of the relieved stress or threat in the pressure transaction with Party G_B .
12. Good W represents the value to G_C of the relieved stress or threat in the pressure transaction with Party C.
13. Good Z represents trade barrier reductions wanted by G_B but withheld by G_C on the Y's provided by Party B to D's in C's home market.
14. Parties B and G_B are engaged in a pressure transaction in which B agrees to relieve pressure applied to G_B in exchange for wanted trade reductions (good V) on the Y's provided by B to D's in C's home market.
15. Parties G_B and G_C are engaged in a pressure transaction in which G_B agrees to relieve pressure applied to G_C if G_C agrees to reduce trade barriers on the Y's provided by B to D's in C's home market.
16. Parties G_C and C are engaged in a pressure transaction in which C agrees to relieve pressure applied to G_C if G_C withholds trade concessions from G_B on the Y's provided by G_C to D's in C's home market.

Main Power Factors

1. Party B's EP for X, Party C's EP for X, and Party D's EP for Y have already been defined in our main model, p.86.
2. B's EP for V represents the gross benefit of V to B diminished by the opportunity costs of relieving the pressure applied to G_B .
3. G_B 's EP for U represents the gross benefit of U to G_B diminished by the opportunity costs of providing V to B.
4. G_B 's EP for v represents the gross benefit of v to G_B diminished by the opportunity costs of threat relief in the transaction with G_C .
5. G_C 's EP for x represents the gross benefit of x to G_C diminished by the opportunity costs of providing v to G_B .
6. G_C 's EP for W represents the gross benefit of W to G_C diminished by the opportunity costs of providing Z to C.
7. C's EP for Z represents the gross benefit of Z to C diminished by the opportunity costs of relieving the pressure applied to G_C .

Given the above definitions, assumptions, and power factors in this game, it is now possible to make the following inferences about inter-related changes in power and bargaining power inherent in the interaction:

Theorem 1

G_B 's EP for U is in direct proportion to the stress or threat applied by Party B (Theorem 11, p. 46)

Theorem 2

The amount of stress that G_B applies to G_C on behalf of B varies directly with changes in G_B 's EP for U in transactions with B (by definition of good V). This infers that G_C 's EP for x is related directly to G_B 's EP for U.

Theorem 3

G_C 's EP for x in transactions with G_B is inversely related to the stress of threat applied to G_C by C. This infers that G_C 's EP for x is inversely related to G_C 's EP for W in transactions with C. (by definition of good Z).

Theorem 4

G_C 's EP for x in transactions with G_B is in direct proportion to the stress or threat applied by G_B (from theorem 11).

Theorem 5

G_C 's EP for W in transactions with C is in direct proportion to the stress or threat applied by C (from theorem 11).

Theorem 6

B 's EP for X in transactions with D varies directly with G_C 's EP for x and inversely with G_B 's EP for v (this is because better C terms for G_B in the transaction with G_C mean a greater reduction in trade barriers which will allow B 's EP for X to expand in transactions with D in C 's home market).

Theorem 7

Party B 's power and bargaining power in transactions with G_B vary directly with the stress or threat applied by B (from theorem 1, p.111).

Theorem 8

Party G_B 's bargaining power in transactions with G_C varies inversely with G_B 's bargaining power in transactions with B (from theorem 2, p.111).

Theorem 9

Party G_C 's bargaining power in transactions with G_B varies inversely with G_C 's bargaining power in transactions with Party C (from theorem 3, p.111).

Theorem 10

Party B 's bargaining power in transactions with Party D varies inversely with G_B 's bargaining power in transactions with G_C (from theorem 6).

Theorem 11

Party C 's bargaining power in transactions with D varies directly with Party G_C 's bargaining power in transactions with Party G_B . (from theorem 6).

Implications of the Pressure Model

This section will illustrate two of the many possible parametric changes in power factors which might alter the interrelated plain power and bargaining power forces that are inherent in this complex interaction.

Intersystem Interactions: Developmental Analysis

Given the basic model, assume that a cet.par. increase occurs in the stress or threat applied to Party G_c by Party G_B . Such an increase will raise G_c 's desire for stress or threat relief ($G_c x$). Such an event will, by theorem 4, p. 112, increase G_B 's bargaining power and reduce G_c 's while it raises G_B 's power to get v and G_c 's power to get x . An increase in G_B 's bargaining power in the transaction with G_c allows for the possibility of a larger reduction in trade barriers to the Y's provided by Party B's to D's in C's home market. Reduced trade barriers allow for an extension of B's EP relative to C's EP in product market transactions with D's. By theorem 24, p.54, such an extension of B's EP will raise B's plain power and reduce C's in transactions with D's. We conclude therefore that a cet.par. increase in stress applied to G_c by G_B will raise B's plain power and reduce C's in product market transactions with Party D's.

Return to the basic model and assume instead that a cet.par. increase occurs in the stress or threat applied to Party G_c by Party C. Additional stress placed on G_c by Party C will raise the cost to G_c of providing v to G_B . Such an increased cost will raise $G_c v$ and contract G_c 's EP for x , raising G_c 's bargaining power and reducing G_B 's while it decreases

G_B 's power to get v and G_C 's power to get x . An increase in bargaining power for Party G_C opens the possibility for smaller reductions in trade barriers to occur, which, by theorems 10 & 11, p.112 and 25, p.55, helps to maintain Party C's power relative to Party B's in product market transactions with Party D's. We conclude therefore that a cet. par. increase in stress or threat applied to G_C by Party C will raise C's power and reduce B's in product market transactions with Party D's.

We note in passing that the goals of Parties C and B are in direct conflict, both in the transaction between G_C and G_B , and in the competitive product market transactions with Party D's. Interpersonal conflict exists between Parties C and B in that better terms for one in the final terms of settlement mean worse terms for the other. Presumably, if all parties were aware of the structure and properties of this interaction model, a zero-sum game² of strategy might develop in which the parties, as players, would engage in strategic manipulations of crucial EP's in an attempt to raise their power and bargaining power over the terms of settlement in the main transaction between G_C and G_B . At any rate, this model does appear to provide the analyst-observer with understanding through logical precision without sacrificing immediate relevance to real idiographic phenomena.

²Party B's gain is Party C's loss in the negotiations between G_B and G_C . If the EP's of D's remain fixed, then it is not possible for the plain power of B's to increase without a corresponding decrease in the plain power of C's in the transaction with D. This is the basis for the interpersonal conflict between B's and C's in C's home market. The literature in game theory typically alludes to zero-sum games within the context of parlor games such as chess or poker. The complex interaction between B and C is also zero-sum, and may involve similar types of strategy formulation.

"Despite repeated promises by the Japanese to dismantle their myriad nontariff barriers and allow more foreign goods into their potentially rich market, Japan's trade surplus continues to pile up...Sony TV's, Nikon cameras and other Japanese goods to the U.S. outpace American exports to Japan by \$13 billion, accounting for fully one third of the American trade deficit.

No substantive trade issues were resolved (between Prime Minister Masayoshi Ohira and President Carter during Ohira's visit to the U.S. this May) but Ohira showed a conciliatory attitude that managed to ease, if not erase, the skepticism about Japan's intentions and the talk of economic retaliation...Still, some Administration officials fear that Congress, in its present impatient mood, could take severe action against Japanese imports. Anger at Japan's nontariff restrictions has been intensifying in both the U.S. and Europe. Congressional leaders have warned that unless Japan moves more quickly to cut its surplus, Congress will impose a 15% tariff surcharge on Japanese goods, and take other retaliatory steps (see theorem observation 5, p.95). Says Senator Lloyd Bentsen of Texas: 'I can see no good reason for the U.S. to commit economic harakiri on the alter of a bogus free-trade relationship'... The threat of selective protectionism against Japan is rising (in both America and Europe) and it worries U.S. officials. It would dangerously damage relations with...the biggest customer in the Far East and possibly lead to an international trade war".

Time, May 14, 1979

A Note on Measurement and Prediction

A conclusion reached by most economists is that it is essential to deal with measurable quantities if economics is to achieve scientific status. The scope of economic theory has traditionally been limited to those phenomena which can be tested by measurement in terms of objective exchange value. Economics, as a science, deals with measurable data in which the question of "how much" is a part of accurate observation.

The hypotheses of any scientific theory must bear some relation to evidence. Evidence consists of observable objects or events in the real world. An event can signify changes in measurable economic magnitudes

as in quarterly changes in the rates of inflation or unemployment, or it can signify the overt behavior of parties in complex interactions. Both kinds of events are observable in the real world.

Our complex simulation model on the previous page utilizes deduced theorems concerning changes in power and bargaining power in transactions between the component parties of a social system. Such phenomena are essentially non-measurable in the overt, objective sense. However, actual or expected changes in the power positions of the parties at the intersystem level provide the cost and benefit "data" on which the observer-analyst can predict those behaviors which are advantageous to the parties in achieving their goals as well as those which are not. The actual behavior of the parties then provides an observable test of correspondence between the simulation model's predictions and social events in the real world.

According to our simulation model, Party C can take action to improve G_C 's bargaining power in the negotiations between G_C and G_B by reducing the pressure applied to G_B by Party B. Tactical messages communicated directly from Party C to Party B which reduce the gross benefit of V to Party B may also reduce the pressure that B applies to G_B in an attempt to acquire good v from Party G_C .

"A Message From Japan Information Center - 'The Japanese Market is Ready and Willing - If You've Done Your Homework'

...Over the last few months Americans have viewed their international trade balance with increasing alarm. One result has been a flurry of criticism of Japan's import practices. The Japanese market, it is said, is closed to U.S. merchandise, with complex tariff and nontariff

barriers blocking the way from abroad...With all due respect, it seems clear that one of the main barriers to an expansion of U.S. exports to Japan is a lack of understanding by American businessmen about what it takes to be a successful exporter.

In the 1950's when we (the Japanese) began to export to the United States we had to study everything about your country: climatic conditions, government controls, consumer preferences, lifestyles, etc. ...Today's successful Japanese exporter can project sales for Boston and Bakerfield, shipping costs to Seattle and Tampa and after-sales service requirements for every area of the U.S. He knows which products will sell well in New York but not in California, and why. He knows the exact day his factories must begin Christmas production in order to meet Pacific Shipping and U.S. distribution schedules for Yuletide sales. In short, he's an export professional...and he certainly knows better than to pull something off his domestic production line and expect it to be accepted "as is" in a country halfway across the world.

Japan is a huge and promising market, but it is not the same market as the United States. Failure to take this into account can lead to export problems which, with a minimum of research should never occur. Common sense? Yes, but a surprising number of American businessmen seem to lack this awareness..."

Fortune, December 31, 1978

CHAPTER SIX - THE CIRCULAR FLOW AS A SOCIAL ORGANIZATION: GOVERNMENTAL CONTROLS

The Circular Flow as a Social Organization

It is assumed in this model (assumption 1.1, p.23) that certain subsystem formal organizations of players, i.e., top staff of government and the Federal Reserve, display a sponsor attitude toward the economic performance of the system as a whole. The decision outputs of these organizations are designed to keep main system variables (employment, interest rates, and prices) within specified ranges. This chapter discusses the means by which the government and the Fed perform stabilizing roles in the organization at the macro level.

We can make use of selected theorems developed in the circular flow model to investigate the effects of monetary and fiscal actions on the intersystem power and bargaining power forces in each of the market interactions of our model. The following assumptions form the basis for the theoretical deductions that follow:

Main Assumptions

1. All market structures conform to assumptions listed in the model of supply and demand, pp. 75-84.
2. Prices and wages are completely flexible in all product, factor, and credit markets. Exchange rates are also flexible in the external currency market.
3. Money is non-neutral. Partial money illusion exists in the factor market.
4. Sponsors of the Federal Reserve possess the delegated authority sufficient to motivate sponsors of member commercial banks to alter their deposit reserves or discount borrowings as instructed.
5. All players, parties, and their formal organizations make decisions rationally in light of expected future costs and benefits of perceived alternatives.

6. The system states of parties are allowed to change during the analysis. Our interest is focused primarily on the developmental change of system variables at the holistic level.
7. Policy actions taken by the Fed and the government are sufficiently strong to alter the consensus terms of all market interactions in ways that their sponsors desire. The analysis is limited to the short-run only.
8. Transactions are not unique, but are interrelated as specified in theorems 63 and 64, p.85.
9. All parties know their own preferences for the goods they exchange, and make no errors in the terms they are willing to accept.
10. Intrasystem decision processes, as specified in sections 1.0-6.0, pp.25-28, are assumed operative in this model.

Chapter Overview

The crux of this macroeconomic section involves changes in the consensus terms as well as the number of completed circular flow transactions that result from policy actions that alter the preference functions of subsystem players toward the goods exchanged. The conclusions in this section parallel the traditional predictions arrived at through the IS-LM macroeconomic apparatus. The LOSS model tools, however, emphasize the effect that changes in the system states of parties will have on the consensus terms that prevail in the loan, product, and factor markets at the main system level. It is presumed that if a sufficiently large number of EP's are affected by monetary and fiscal policy actions, then the consensus terms will be altered in ways specified by theorems 59 - 62, pp.83-84. Again, this section is a redescription of the Keynesian macroeconomic model, but with emphasis on

the intersystem power forces that mold¹ the consensus terms on which transactions are completed. We shall begin the analysis with monetary controls before we investigate the response of the circular flow system to changes in spending, tax, and price controls by government.

Credit Power in Circular Flow Transactions

Tight Money: Holistic-Intrasystem Effects

A cet.par. reduction of the supply of bank credit created by a tight money policy of the Federal Reserve² will, by theorem 59, p.83, raise the consensus terms and reduce the number of completed loan transactions between financial intermediaries and the domestic or foreign public. Those prospective buyers of credit funds (including firms seeking to finance investment projects or consumers seeking to finance present purchases of goods and services by forfeiting future income) who fail to complete loan transactions with financial intermediaries will have contracted EP's³ in product market transactions with domestic or

¹This term is used in the sense that main system variables like the prime interest rate, the unemployment rate, and the rate of inflation register values which both reflect and affect the system states of its subsystems and the power forces which delimit the terms of their transactions.

²The Federal Reserve can create conditions of excess demand in the money markets by raising reserve requirements of member banks, engaging in sales of government securities in the open market, or by raising discount rates. Each of these "behaviors" of the Fed helps to dampen aggregate demand in the product market.

³All statements supported by theorems 63 and 64 of the interrelated transactions model refer to changes in demand induced by actual (or expected) changes in income. Inferior goods whose income effect is negative are excluded from the model.

foreign firms, which, by theorem 61, p.83, will lower the consensus terms and reduce the numbers of completed product market transactions. Those firms who fail to complete product market transactions will, by theorem 64, have contracted EP's in factor market transactions with factor suppliers of labor services⁴. A contraction in the EP's of buyers of labor services will, by theorem 61, p.83, lower the consensus terms of trade as well as reduce the number of completed transactions. With respect to our main system variables we would expect a decline in the level of employment, income, output, wages, and prices, and a rise in interest rates. The direction of change in these variables is subject to positive feedback, as factor suppliers who fail to complete factor market transactions will have contracted EP's for goods and services in the product market.

Holistic-Intersystem Effects

A tight money policy sufficient to raise interest rates and reduce prices, wages, employment, and incomes at the main system level will contribute to a balance of payments surplus as follows: currency inflows are increased as the rise in interest rates and the fall in relative prices raise the plain power of firms and financial intermediaries to complete product and deposit transactions respectively with parties in foreign economies. Currency outflows are decreased as those factor suppliers who fail to complete factor market transactions with employers will, as consumers (theorem 64, p.85) experience a decline in their plain power to complete product market transactions with foreign firms.

⁴We consider labor services the single variable input in the short run.

Any increase in the exchange rate as a result of the payments surplus will tend to restore balance of payments equilibrium. The exchange rate increase will help to contract the EP's of domestic producers in the foreign market and expand the EP's of foreign producers in the domestic market, which, by theorem observation 2, p.91, contributes to an increase in currency outflows and a decrease in currency inflows.

Easy Money: Holistic-Intrasystem Effects

A cet.par. expansion of the supply of bank credit by the Federal Reserve will, by theorem 60, p.83, lower the consensus terms and raise the number of completed loan transactions between financial intermediaries and the domestic or foreign public. Buyers of credit funds who complete loan transactions with intermediaries will, by theorem 63, p.85, have expanded EP's in product market transactions with domestic or foreign firms, which, by theorem 62, p.84, will raise the consensus terms as well as raise the numbers of completed product market transactions. Firms who complete added product market transactions with buyers will, by theorem 63, p.85, have expanded EP's for factors, which, by theorem 62, p.84, will raise consensus terms (wages) in factor market transactions as well as raise the number of completed transactions involving labor services. We would therefore expect an increase in the main system variables of employment, wages, income, output, and prices, while we would expect a decrease in the overall level of interest rates.

Holistic-Intersystem Effects

A loose monetary policy sufficient to reduce interest rates and raise prices, wages, employment, and incomes will contribute to a balance of payments deficit as follows: the rise in factor incomes will, by theorem 63, p.85, and theorem 27, p.57, raise the plain power of factors, as consumers, to complete domestic product market transactions with foreign producers. The rise in relative prices, induced in part by the rising cost of factors in B's market, will, by theorem observation 3, p.93, reduce the plain power of domestic producers (exporters) to complete product market transactions with foreign consumers (D's) in the foreign market. Also, the decline in interest rates will reduce the plain power of financial intermediaries to complete deposit transactions with holders of foreign investment capital. Any decrease in the exchange rate, p , that this deficit creates will, by theorem observation 1, p.89, contract the EP's of foreign producers in the domestic product market and expand the EP's of domestic producers in the foreign market. The exchange rate effect of a loose money policy therefore contributes directly to elimination of the deficit and a restoration of balance of payments equilibrium.

Fiscal Policy Effects on Power Forces in Circular Flow Transactions

Tax Rebates: Holistic-Intrasystem Effects

A cet.par. rebate in income taxes by government will raise disposable incomes of households and firms in the circular flow system. By theorem 63, p.85, the added disposable income will expand the EP's

of households and firms in product market transactions with domestic or foreign firms. By theorem 62, p.84, a tax rebate can be expected to raise the consensus terms of completed product market transactions as well as increase their number. Firms who complete added transactions with consumers at better terms will, by theorem 63, p.85, have expanded EP's for factors, which, by theorem 62, p.84, will also raise the consensus terms of factor market transactions as well as lead to an increase in their number. Tax rebates, which are not accompanied by expansionary monetary policies, will expand the EP's of buyers of credit funds in loan transactions with financial intermediaries (as the real value of the money stock decreases) and, by theorem 62, p.84, will raise the consensus terms of completed loan transactions. We would therefore expect to observe an overall increase in prices, output of goods and services, employment, wages, interest rates, and incomes to result from a tax rebate of sufficient magnitude by government.

Holistic-Intersystem Effects

The effect of the tax rebate policy on the consensus terms of trade in the external currency market is indeterminate. Currency outflows are increased as the rise in incomes increases the plain power of consumers to complete product market transactions with foreign producers. As a result, the EP's of suppliers of dollars are expanded in the external currency market. However, the direction of change in the EP's of buyers of dollars is uncertain. The relative rise in interest rates helps to raise the plain power of domestic financial intermediaries to complete deposit transactions with parties in foreign economies, while

the rise in relative factor prices, induced by the rise in factor incomes, will, by theorem observation 3, p.93, reduce the plain power of domestic producers in the foreign market. The direction of change in the overall demand for dollars in the external currency market is uncertain. Therefore the net effect of the tax rebate on the consensus terms in the currency market is also uncertain. A payments surplus will help to counteract the internal expansionary effects of the tax rebate by contributing to an increase in the exchange rate, which, by theorem observation 2, p.91, decreases the plain power of domestic producers to complete produce market transactions with both domestic and foreign buyers. A payments deficit, on the other hand, will help reinforce the expansion by contributing to a decrease in the exchange rate, which, by theorem observation 1, p.89, increases the plain power of domestic producers to complete product market transactions with both domestic and foreign buyers. The holistic-intersystem effect of a tax rebate policy depends, therefore, on the direction of change in the exchange rate.

Tax Surcharges: Holistic-Intrasystem Effects

A tax surcharge initiated by government will, cet.par. reduce the disposable incomes of households and firms in the circular flow system. By theorem 64, p.85, the reduction in disposable income will contract the EP's of households and firms in product market transactions with domestic or foreign firms. By theorem 61, p.83, a tax surcharge can be expected to help lower the consensus terms of completed product market

transactions as well as reduce their number. Firms who complete fewer transactions at worse terms will, by theorem 64, p.85, have contracted EP's as employers for factor inputs. By theorem 61, p.88, a contraction in the EP's of employers will help lower the consensus terms of factor market transactions as well as lead to a reduction in their number. Tax surcharges which are not accompanied by contractionary monetary policies will contract the EP's of buyers of credit funds in loan transactions with financial intermediaries, (as the real value of the money stock rises), and, by theorem 61, p.83, will help lower the consensus terms of completed loan transactions. We would therefore expect to observe an overall decrease in prices, output, employment, wages, interest rates, and incomes to result from a tax surcharge of sufficient magnitude by government.

Holistic-Intersystem Effects

The effect of the tax surcharge policy on the consensus terms of trade in the external currency market is indeterminate. Currency outflows are decreased as the fall in factor incomes decreases the plain power of consumers to complete product market transactions with foreign producers. As a result, the EP's of suppliers of dollars are contracted in the external currency market. The direction of change in the EP's of buyers of dollars is less certain. The relative decline in interest rates helps to reduce the plain power of domestic financial intermediaries to complete deposit transactions with parties in foreign economies, while the fall in relative factor prices, induced by the decline in factor incomes, will, by theorem observation 4, p.94, increase

the plain power of domestic producers in the foreign market. The direction of change in the overall demand for dollars in the external currency market is uncertain. As a result, the net effect of the tax surcharge on the consensus terms in the currency market is indeterminate. A payments surplus will help to reinforce the internal recessionary effects of the tax surcharge by contributing to an increase in the exchange rate. This increase will, by theorem observation 2, p.91 decrease the plain power of domestic producers to complete product market transactions with both domestic and foreign buyers. A payments deficit, on the other hand, will help counteract the recessionary effects of the tax surcharge by driving down exchange rates, which, by theorem observation 1, p.89, will increase the plain power of domestic producers in both the domestic and foreign product markets. The holistic-inter-system effect of a tax surcharge policy depends, therefore, on the direction of change in the exchange rate.

Fiscal Spending Effects on Power Forces in Circular Flow Transactions

Fiscal Spending Increase: Holistic-Intrasystem Effects

A cet.par. expansion in government's EP for the Y's of domestic firms or factor suppliers will have the following effects on main system variables in the circular flow. This policy is intended to raise the plain power of large numbers of domestic firms. By theorem 62, p.84, we should expect the consensus terms of trade to rise and the number of completed product market transactions to increase. Those firms who interact with government and who complete added transactions

will, by theorem 63, p.85, have expanded EP's for factors, which, by theorem 62, p.84, will raise the consensus terms of trade and increase the number of completed factor market transactions.⁵ Those factor suppliers who complete greater numbers of transactions at better terms will, by theorem 63, p.85, have expanded EP's in their deposit, tax, and product market transactions respectively. If this fiscal spending policy is financed directly from tax receipts, and if the supply of money remains unchanged, we should expect an overall increase in prices, output, wages, employment, incomes, and interest rates to occur at the holistic-intrasystem level.

Holistic-Intersystem Effects

The effect of a fiscal spending increase, cet.par., on the balance of payments at the holistic-intersystem level is indeterminate. The rise in incomes increases the plain power of consumers to complete product market transactions with foreign producers, but the rise in relative factor prices (induced by the rise in factor incomes) and the rise in interest rates will have opposing effects on currency inflows at the main system level. A balance of payments surplus will tend to raise the exchange rate which, by theorem observation 2, p.91, will help reduce the plain power and profits of domestic producers in the foreign market. The surplus will also help to dampen the increase in domestic prices and employment as the rising exchange rate, cet.par., increases the plain power and profits of foreign producers in the

⁵Government can also raise the plain power of factors directly through the institution of new government projects and programs.

domestic product market. A balance of payments deficit will tend to lower the exchange rate, which, by theorem observation 1, p.89, will help raise the plain power and profits of domestic producers in the foreign market. The deficit will also help to reinforce the increase in domestic prices and employment as the falling exchange rate, *cet.par.*, decreases the plain power and profits of foreign producers in the domestic product market (by theorem observation 1, p.89). The holistic-intersystem effect of a fiscal spending increase depends, therefore, on the direction of change in the exchange rate.

Fiscal Spending Decrease: Holistic-Intrasystem Effects

A *cet.par.* contraction in government's EP for the Y's of domestic firms or factor suppliers will reduce the plain power of large numbers of firms in the product market. By theorem 59, p.83, we should expect the consensus terms of trade to fall and the number of completed product market transactions to decrease. Those firms who interact with government, and who fail to complete transactions, will, by theorem 64, p.85, have contracted EP's for factors which, by theorem 61, p.83 will help to reduce the consensus terms and the number of completed transactions in the factor market. Those factor suppliers who fail to complete transactions with employers as a result, will, by theorem 64, p.85 have contracted EP's in their deposit, tax, and product market transactions respectively. If the supply of money remains unchanged, we would expect to observe an overall decrease in prices, output, wages, employment, incomes, and interest rates at the holistic-

intrasystem level.

Holistic-Intersystem Effects

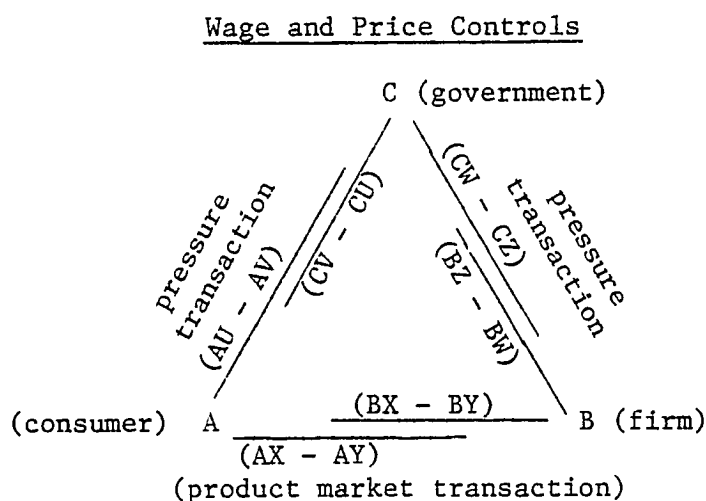
The effect of a fiscal spending decrease, *cet.par.*, on the balance of payments at the holistic-intersystem level is indeterminate. The decline in incomes decreases the plain power of domestic consumers to complete product market transactions with foreign producers, but the fall in relative factor prices (induced by the fall in factor incomes) and the decline in interest rates will have opposing effects on currency inflows at the main system level. A balance of payments surplus will tend to raise the exchange rate which, by theorem observation 2, p.91, will help reduce the plain power and profits of domestic producers in the foreign market. The surplus will also reinforce the decline in domestic prices and employment as the rising exchange rate, *cet.par.*, increases the plain power and profits of foreign producers in the domestic product market (by theorem observation 2, p.91). A balance of payments deficit will tend to lower the exchange rate, which, by theorem observation 1, p.89, will help to raise the plain power and profits of domestic producers in the foreign market. The deficit will also help to counteract the decrease in domestic prices and employment as the falling exchange rate, *cet.par.*, decreases the plain power and profits of foreign producers in the domestic product market. The holistic-intersystem effect of a fiscal spending decrease depends, therefore, on the direction of change in the exchange rate.

Wage and Price Controls

Administration pressure put on sponsors of firms and labor unions to maintain their price and wage demands within specified ranges is another means by which government controls the main system variables in the circular flow. Firms and unions are transformed into subsystem role occupants of a formal organization with the top staff of government as sponsors who use their monopoly on the legitimate use of force to induce participation by applying sanctions (bads) to subsystems who fail to perform their roles as instructed. The analysis of this type of complex interaction can be viewed as a three party pressure interaction as described by theorems 46-58, pp.69-72.

Diagram and Definitions

Diagram 34



1. Party C: government as a formal organization
2. Party B: a representative domestic firm
3. Party A: a representative domestic consumer
4. Good Y represents units of a good or service supplied by Party B to Party A.

5. Good X represents dollars supplied by consumer A to firm B.
6. Good W represents the value to government of firm B's compliance with the guidelines.
7. Good Z represents the value of stress or threat relief (avoided loss of government contracts, tariff reduction on competing imports, etc.) to firms.
8. Good U represents the desire of consumer pressure organizations for higher levels of real income (lower rates of inflation).

Main Power Factors

1. Party A's EP for Y and Party B's EP for X are defined in the original pressure model, p.69.
2. Party A's EP for U represents A's gross preference for lower rates of inflation diminished by the forgone benefit of relieving the stress applied to Party B.
3. Party C's EP for V represents C's gross preference for stress relief (CV) diminished by the cost of providing U to A. The cost to C of providing U to A is the amount of cost C is willing to absorb in applying stress to Party B.
4. Party C's EP for W represents C's gross preference for B's compliance with the price controls (CW) diminished by the cost of relieving the stress on B (CZ).
5. Party B's EP for Z represents B's gross preference for stress relief (BZ) diminished by the cost to B of compliance (BW) with the controls. BW represents B's desire not to comply with the controls.

Deductions From the Model

Theorems 46-58 can now be applied to this wage and price control model. Of primary importance is theorem 56, p.72, which states that the plain power and bargaining power of consumers in transactions with firms vary inversely with changes in firms' EP's to comply with the controls (B's EP for Z). Two factors tend to inhibit cohesion in the organization between parties C and B. The first is a game-theoretic concept known as the "prisoner's dilemma." Uncertainty about the

proposed actions of competitors fosters a lack of trust between firms. A lack of trust adds to the desire of firms not to comply with the controls. Therefore, a loss of trust between firms will raise BW, which decreases C's power to get W, and (by theorem 56), p.72) A's power to get Y. Enhanced trust has the opposite effect and promotes cohesion which generates trust in a positive feedback movement toward a stable organizational structure.

A second factor which impedes stability of the organization between government and business concerns the legitimacy of government's authority to use bads to induce the participation of firms into membership in the organization. A decline in government's authority to induce business membership in the organization will reduce the cost to firms of non-compliance. Their desire not to comply is increased; BW rises and thus the power of government to control B's EP in dealing with A is reduced, as is A's power to get Y.

"The Administration's wage and price guidelines, the program that business people and wage earners love to hate, has been as dead as Confederate currency since early spring. Last week a federal district court judge in Washington nailed the coffin shut. Judge Barrington D. Parker ruled in favor of the AFL-CIO and nine other union plaintiffs that President Carter had exceeded his authority in promulgating the guidelines. By threatening to withhold federal contracts from companies who violated the guidelines, the judge concluded, the program was coercive and thus 'establishes a mandatory system of wage and price controls, unsupported by law' ...Even as Judge Parker was gutting the program, White House Inflation Czar Alfred Kahn was publicly attacking Amerada Hess, an oil company, for breaching the price standards. A Hess spokesman retorted, almost sneeringly: 'We regret that the guidelines, as established by the council, do not allow us to comply.'" Groaned one Administration official: 'They're thumbing their noses at us.'"

Time/June 11, 1979

CHAPTER SEVEN - SUMMARY OF TEST RESULTS AND CONCLUSIONS

Summary and Conclusions

The basic model has now been constructed and a few principle topics in economic theory have been examined with it. The question we seek to answer in this chapter is not whether a simulation built from unified tools is possible, but whether or not the simulation has adequately met the test criteria set forth in chapter one. We proceed to answer this question by considering each criterion in turn:

Criterion 1

With any organization of humans, the analytic boundaries of that organization are drawn by the investigator, with respect to his interests. The basic analytic structure of our circular flow model parallels the standard conception of a neo-classical economic system. But whereas the conventional model focuses on the chief triad of basic economic problems - What, How, and For Whom, the simulation in this paper focuses on the circular flow as a large informal organization of subsystem players who interact as occupants of multiple, interdependent roles, and who participate in various special-purpose social systems (LPM's) that contribute to the satisfaction of their economic wants. A more balanced view of the economic system, both as an analytic yardstick of economic performance and as a unique pattern of social organization may be of practical advantage to those economists who seek greater understanding of and control over economic events involving interpersonal conflict. This is the spirit in which this paper seeks to add to the coverage of economic analysis, and has done so by

constructing a model that meets the requirements of criterion 1.

Criterion 2

Throughout this simulation, we have attempted to apply the LOSS model tools at different levels of systems analysis. We began in chapter three with cross-sectional holistic and reductionist analysis of the circular flow at the intrasystem and intersystem levels, before proceeding with the developmental in chapters four - six.

The flexibility of perspective provided by the systems approach to economic analysis, plus the tool of transaction theory as a general model of social exchange, allow the analyst to study a variety of economic problems¹ with the same set of tools. All that is necessary is a narrowing of analytic scope by making the appropriate substitution of assumptions in the general model developed in chapter three. We have sought to meet criterion 2 by demonstrating this method, particularly in the complex interaction of chapter five and the wage and price control section in chapter six.

Criterion 3

According to Professor Kuhn,² the distinguishing feature of a truly integrated social science is that all concepts and language it uses to describe social phenomena are ultimately reducible to a parsimonious,

¹Problems such as the effect of protectionist policies by government on the intrasystem and intersystem behavior of multinational corporations, or the effect of various incomes policies on the power forces which determine the terms of trade between nations, are problems to which our simulation can be applied.

²Kuhn, The Logic of Social Systems, p.17.

but general, set of analytic tools. Just as a lever in the most complex machine never follows different rules than a lever in isolation, so has the simulation developed in this paper attempted to study a variety of economic phenomena, i.e., the model of supply and demand, wage and price controls, trade negotiations, competition, etc., by properly intersecting the appropriate LOSS model concepts into configurations that are best suited to the particular interest of the observer-analyst.

One of the prices paid by the analyst for using general concepts to describe market interactions (especially in chapter six) is the loss of determinacy. Conventional market models show an intersection of price and quantity that is theoretically determinate for both variables. By focusing on power and bargaining power, our model shows the direction of change in price and quantity, but not their magnitude. The transaction model elicits deductions about the determinant of price, not price itself. But to say that the conclusions reached during analysis are not theoretically determinate does not mean that they are not measurable or testable, as demonstrated by our analysis of chapters five and six. One of the transaction model's greatest analytic strengths is its theoretical indeterminacy, the absence of which would prevent us from deducing the theorems required to construct the limited-purpose models necessary to meet criterion 3.

Criterion 4

Throughout this paper, an attempt has been made to illustrate real world interactions that correspond closely to the interactions studied

in our nomothetic simulation. We feel that an understanding of the power forces which motivate the behavior of players in circular flow interactions may prove useful to the policy economist, the game theorist, or anyone else interested in the effect of non-market³ interactions on the pattern of resource allocation, income distribution, or on the level of economic performance at the main system level. In addition, certain, seemingly disparate, types of economic interactions at the idiographic level (wage and price control and affirmative action interactions) are shown to be quite similar in their structure at the nomothetic level. There appears to be a distinct analytical advantage to adopting a general social science capable of making theoretical statements about each. We feel that the correspondence between the nomothetic and the idiographic demonstrated in this simulation meets the requirement of criterion 4.

Criterion 5

Chapter three of our simulation demonstrated the basic correspondence between the LOSS model of decision-making and the basic economic analyses of consumer preference, consumer demand, production theory, distribution theory, employment theory, and the theory of market price. All of these areas involve the making of rational decisions within constraints, or optimal allocation under conditions of scarcity. Aside from redescribing fundamental price-theory concepts

³In particular, the application of strategic bids (stress and threats) in simulating non-market pressure interactions, as originally developed in Kuhn's LOSS model, and theorems 11-22, pp.46-48, have proved quite useful.

at the micro level, the LOSS model tools were also used to simulate the economy's performance at the macro level, as presented in chapter six. The LOSS model tools were not applied in those areas of economic theory, such as technological change, whose origins are physical rather than social. We have only tested a subset of areas in economic theory, but there seem to be other potential correspondences which could be investigated with this general model. Even specialized economic topics as dissimilar as Leibenstein's "Band Wagon, Snob, and Veblen Effects in the Theory of Consumers' Demand"⁴ and Friedman's "Permanent Income Hypothesis"⁵ are descriptions of common intrasystem and inter-system behaviors of players in different roles and in different sets of circumstances. The variables may change, but the basic formulas remain the same. The use of LOSS model tools to understand these basic formulas in economic interactions may prove enlightening.⁶

Although the simulation model developed in this paper is still very young, we expect it to point the way toward further testing of the

⁴Harvey Leibenstein, "Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand", The Quarterly Journal of Economics (Cambridge, Mass.: Harvard University Press), May, 1950.

⁵Milton Friedman, A Theory of the Consumption Function (Princeton, N.J.: Princeton University Press, 1957), chapters 1-3, 6, 9.

⁶The reader is referred to Harvey Leibenstein's article in the June, 1979 issue of the Journal of Economic Literature entitled, "A Branch of Economics is Missing: Micro - Micro Theory". The application of the LOSS model tools of controlled systems behavior, decision theory, and organization theory to describe the manner in which individuals in multi-person firms influence firm decisions may enable the economist to explore this new "research frontier".

LOSS model concepts in economics, as well as in the other social science specialties. At this time, because of the correspondences demonstrated in this paper between the LOSS model concepts and extant economic analysis, we conclude that we are unable to reject the integrated social science hypothesis. Along with this conclusion we would like to add a few closing remarks concerning the potential significance of the LOSS model to the fields of game theory and integrative studies.

The Application of Transaction Theory to Games of Strategy

As defined by Rapoport, game theory can be identified as "an extension of a theory of rational decisions involving calculated risks to one involving calculations of strategies to be used against rational opponents, competitors, or enemies; that is, actors who are pursuing their goals, and typically, attempting to frustrate ours."⁷ We now refer the reader back to the complex interaction on pp.107-117. This simulation can be considered a game; the opponents behave rationally; the game "rules" are the deduced theorems (46-58, pp.69-72); actors pursue their own goals and make "moves" (engage in tactical or strategic manipulations of EP's) to frustrate the goals of others. Contingency moves can be considered with payoff values imputed to the set of all possible outcomes (all values to all parties of the final terms of trade) in the negotiation between Parties G_B and G_C .

⁷ Anatol Rapoport, N-Person Game Theory (Ann Arbor: University of Michigan Press, 1970), p.45.

Theorems 46-58 provide the constraints within which parties plot their game strategies, each party being aware of how its behavior will alter the power and bargaining power forces which mold the terms of trade between G_B and G_C . It is conceivable that any simulation we construct with our limited-purpose transaction tools can be viewed as a variant of a zero sum or non-zero sum game of strategy between opposing parties. The LOSS model tools can abstract real social problems into simulation models where the involved parties make rational decisions with full information about the "analytic" rules of the game. These same rules, however, do not include the logic of strategy calculation, and the game theorist's sophisticated mathematical solution concepts are needed if a "bargaining - equilibrium analysis of social behavior and of social institutions"⁸ is to be achieved. Game theorists and experimental gamers who demand immediate relevance as well as logical precision from their simulations may possibly benefit from a systems-based model that extends the static theories of the negotiation outcome to include a theory of the negotiation process.⁹

What then is the significance of game theory to the social scientist? First, because there has not been a plethora of applications in a dozen years, it does not follow that the theory will not ultimately be vital in applied problems. Judging by physics, the time scale for the impact of theoretical developments is often measured in decades...Much of the theory is of very

⁸ John C. Harsanyi, Rational Behavior and Bargaining Equilibrium in Games and Social Situations (Cambridge: Cambridge University Press, 1977), p.3.

⁹ Otomar J. Bartos, Process and Outcome of Negotiations (New York: Columbia University Press, 1974), p.21.

general importance, but some revision may be required for fruitful applications. Attention to the theory is needed, and not attention from the mathematician alone, as is now the case.¹⁰

Integrative Applications in the Social Sciences

As specialized research continues in the social sciences, the increased differentiation in each discipline evolves more particularized tools of analysis.¹¹ While the benefit of greater specialization is obvious, we must not overlook its cost. Specialization hardens the analytic boundaries and restricts the flow of ideas between disciplines. One way to soften these boundaries is for specialists to adopt the general-purpose LOSS model tools of analysis in their disciplines. The transaction model is a general tool of exchange behavior. It appears that limited-purpose simulation models similar to those developed in this paper can also be constructed by specialists in all the social science disciplines to investigate the logic of intrasystem and intersystem interactions between parties, regardless of the actual identity of the types of goods (social, political, economic, etc.) exchanged. It appears possible to identify the variations of interactions in the separate disciplines, note the modifications of the basic LOSS model theories that are necessary to explain them and then combine

¹⁰Luce and Raiffa, Games and Decisions, pp.10-11.

¹¹The reader is referred to Donald T. Campbell's "Ethnocentrism of Disciplines and the Fish-Scale Model of Omniscience", in Sherif & Sherif, Interdisciplinary Relationships in the Social Sciences, Aldine, 1969.

these modifications (limited-purpose models) into as many configurations as the simulation model requires. Granted this is possible, the doors would then be open to admit a cross-fertilization of ideas between disciplines. The means would also be available for specialists to use a common conceptual set to teach the content of their disciplines to students of integrative studies, or to explore social problems of scholastic interest previously considered beyond the scope of their specialized tools. Whether they are considered a sub- or super-discipline in their own right, the basic LOSS model tools of social system analysis used in this paper may enable scientists to build a more efficient¹² knowledge structure of the social system.

¹²Kuhn, The Logic of Social Systems, p. xix.

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