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AN EMPIRICAL STUDY OF LONG-RANGE PLANNING IN THE MOTOR FREIGHT INDUSTRY

by

ERNEST A. KALLMAN

A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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Abstract

AN EMPIRICAL STUDY OF LONG-RANGE PLANNING
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by

Ernest A. Kallman

Adviser: Professor H. Jack Shapiro

General Systems Theory provided the framework for this study by prescribing a long-range planning function for the firm. The premise is that the organization is an integral part of its environment and so must be examined as part of that whole. As an open system, the motor carrier both influenced and was influenced by the external environment. The external environment offered various uncertainties to the firm, and the planning process was assumed to be necessary to provide for that uncertainty and to be in proportion to that environmental uncertainty. Conversely, the more certain the environment, the less the need for planning and/or the less effect planning would have on corporate outcomes.

The design of the study called for the development of a specialized questionnaire defining through multiple choice and Likert-type questions a measure of the planning commitment of motor carrier firms. The questionnaire was sent to

886 Class I motor carriers regulated by the Interstate Commerce Commission (ICC). Responses were received from 498 firms of which 478 were usable for some analysis and 298 constituted the basic sample upon which the results were based. Economic performance data covering the years 1965 to 1974 was obtained from annual reports submitted to the ICC. A third variable termed "openness" measured the firm's interaction with and dependency upon the external environment.

The hypotheses tested and their results were as follows: Hypothesis 1 stated a positive relationship between planning committment, openness and economic performance. This hypothesis was rejected since the relationships found were at a rather inconsequential level. Hypothesis 1a was also not supported. Highly open firms which did have long-range plans, performed no better economically than those highly open firms which did not plan. Medium open firms also did not vary on economic performance according to their planning commitment, resulting in the rejection of hypothesis 1b. Low open firms according to hypothesis 1c were predicted to perform similarly irrespective of their planning practices. This hypothesis was accepted with one minor exception.

Geographic area of operation, commodity handled and the length of time a carrier planned all had no bearing on economic performance causing the rejection of hypotheses 2, 3 and 4.

Since the general result was that motor carriers did not succeed better economically through the use of long-range planning, a further analysis was made of the environment in which they operate. The explanation for this outcome could only be that there was less environmental uncertainty for the motor carrier than for firms in other industries. The forces that bring certainty or stability into the motor carrier environment are: 1) the influence of the ICC in rights of operation, pricing and financing, 2) the Teamsters union because of the labor-intensive nature of the industry, and 3) the high and uncontrollable costs of transportation, including equipment and fuel. All of these help to explain why the motor carrier industry has a limited capability for strategic response. Planning opportunities are very limited, and therefore, the effects of the plans produced are also limited.

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Professor H. Jack Shapiro served as chairman of my doctoral committee and provided both sound advice and often needed encouragement as he guided this research. His availability and the special interest he took by making industry visits were especially helpful. Professor Alfred Kana, of Seton Hall University, gave unselfishly of his time and advice in helping to analyze staggering amounts of computer output. The continuous guidance of both Professors N. Paul Loomba and Georghios Sphicas as this research progressed was invaluable. I am thankful for having had the opportunity to work with them and learn from them.

Very early in this research two major companies in the industry provided valuable background material and direction. These were Cooper-Jarrett, Inc. whose president,

Robert O. Hall welcomed us and provided guidance and support throughout the study. The other was APA Transport, where through the generosity of President Arthur Imperatore we were exposed to a most knowledgeable planner and industrial engineer, Bill Bacola. Without this early insight, the study as it was framed would not have materialized.

As the study progressed many New York and New Jersey motor carriers participated in the pre-testing of the questionnaire, and many of these were encouraged to participate through the urgings of the two top executives of the New Jersey Motor Truck Association, William E. Jayne, President, and Samuel S. Grossman, Managing Director. They were not only responsible for assisting with the questionnaire pre-test, but also with publicizing the study to their membership.

Special thanks must also be given to the American Trucking Associations, Inc. Without the assistance of this fine organization this study could not have taken place. Not only are we grateful for material support in the way of labels and stationery, but the access to libraries, industry experts, audiences and other sources of information and feedback added a quality to the research that could not have come from any other source. Special thanks go to Clifford R. Buys, Director of Management Systems of the ATA who was our chief contact and helper. Through him we gained the valuable support of Richard H. Hinchcliff, Managing Director of the Technical Services Division, Arch Raub in the Research

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I am afraid that many others who helped in many ways have been omitted here. I am sorry I cannot list them all, but they have my enduring thanks.

CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

The Problem

Since the time of Fayol (1916) management writers and theorists have exhorted businessmen to plan. And the effect has been a definite increase in the number of firms maintaining a corporate planning function (Steiner, 1970). According to Levey and Loomba (1973, p. 270): "Planning has been one of the basic managerial functions." However, managerial acceptance of the formal planning process as essential to effective decision making is not universal. There are many major companies which have no planning function at all, and decisions of such importance as the overall company strategy are made on an intuitive basis.

Almost everything that has been published on the planning process is prescriptive in nature, e.g., Steiner (1969), Ansoff (1965), Ackoff (1970), Cohen and Cyert (1973), Tilles (1970), among others. It would seem appropriate in view of the normative nature of the literature and the increasing but by no means universal practice of planning to determine if the businessman who does plan is better off for his effort and expense than his counterpart who does not plan.

For reasons which will be made clear in a following section, the motor freight industry will be studied within the theoretical framework presented. Specifically the task of this study is to determine whether or not motor carriers who develop strategic plans achieve a greater degree of financial success than their competitors who ignore this function.

Review of Existing Knowledge

There have been very few empirical research studies in the field of planning. Even fewer have been performed in the field of strategic planning. In their recent review article Fulmer and Rue (1974) find that since 1966 there were only six studies whose major focus was the worth of the long-range planning process. And they questioned the quality of some of these, particularly on the basis of sample size. In examining 30 Ph.D. dissertations in the field of planning since 1966, the researcher found that most (16) were concerned with either establishing the characteristics of long-range plans, the nature of the planning process, the amount of management involvement or the policies and practices of various companies.

Three dissertations were concerned with developing a philosophy of planning. Two were experimental studies of planning variations using MBA students. The remaining studies either defined long-range planning, defined the role of the

corporate planning staff, linked long-range plans to organization structure, were case studies of a single firm, dealt with operational planning or with the effects of the computer on the planning process. Only two dealt in any way with the results of planning. In one of these the main purpose was to examine the nature and structure of corporate plans; however, as an added feature the author attempted to make some determination of the success of the plans developed (Rue, 1973). The other study of the success of planning was a deliberate investigation of Texas namufacturing firms (Guynes, 1969). Both of these concluded some positive relationship between long-range planning and performance. Generally the journal articles in the field are spinoffs from the above dissertations, or in one case from an MBA thesis (Thune, 1967).

Thus the literature on planning suffers from a dearth of evidence as to the worth of the planning process, particularly the strategic planning process as measured in terms of corporate growth.

The Motor Freight Industry

The motor freight industry was chosen for this study because of its importance to the economy. In 1973 motor carriers accounted for $21 billion of the gross national product. In the same period railroads contributed only $14 billion (American Trucking Trends, 1974, p. 20). The industry

is characterized by great homogeneity. Some of this is due to the effect of regulation by the Interstate Commerce Commission (ICC) and also to the nature of the service being provided. There seems to be a basic way to operate a trucking company, and the variations on that basic approach are slight. Thus, large or small, most trucking companies have similar structure, organization, functions, skills, and problems.

There are various kinds of motor carriers ranging from those which carry general commodities to those transporting only certain products (steel, autos) to those which specialize in certain types of hauling (liquid, dry bulk, corrosive chemicals). Each of these faces similar planning needs in terms of competition, rates, routes, equipment, personnel, government and state regulation. There is also a tendency in the industry for things to remain the same. This applies to both method of operation and management techniques. For the most part freight is still handled today as it was in 1965 and management directs its operations in much the same manner. This is borne out by the vast majority of carriers who indicated that their planning practices have been the same since 1965 or before!

The regulated nature of the motor freight industry is a significant factor which distinguishes it from other industries. The influence of the regulating body is reflected in pricing, accounting practices, financing, methods of dealing

with customers, not to mention rights of operation and types of commodities handled. Specifically, a carrier is regulated as to the geographic area it can serve. The rates for the service are decided through a common rate bureau and are the same for all carriers servicing the same points. In addition an ICC regulated common carrier cannot refuse to take a bona fide shipment from a shipper, even if it is for a destination point he does not service. In such a case the carrier must transfer the shipment to another carrier who does serve that point. Accounting reports must be submitted to the ICC and in a specialized format. In addition all bills for services rendered must be paid by shippers within seven days. Lamentably for the industry this regulation is not closely followed.

Compared to manufacturing firms, and many other industries as well, trucking companies are rather small. A firm with over $100 million in revenues is quite large and the vast majority are well under $30 million. In 1975 there were some 886 firms in the industry as we define it. These are Class I Common Carriers. This means their annual revenue exceeded $3 million and that the firm was engaged in interstate commerce. This industry definition excludes the smaller ICC regulated carrier and those only operating in one state (and therefore, not regulated by the ICC).

For the most part, motor carriers are closely held firms. Many are individual entrepeneurships. A few are

public companies with their stock traded on well-known exchanges. The industry is characterized by relatively low profits. Net income before taxes of ten percent is high, twenty percent extraordinary.

Another characteristic of the industry is its spirit of cooperation and willingness to share. Motor carriers go to great lengths to learn from each other and to assist each other. When a new technique is developed or a better way of doing a thing is discovered it is made available to others in the industry through newspapers, magazines, the industry association and personal contact. It is this cooperative attitude which contributed to the large response received to the questionnaire used in this study.

Definitions

Although other definitions and perhaps more complete explanations appear in other parts of this study, it is important to list certain key definitions at this time.

Long-range planning for our purposes is any planning activity which carries beyond the end of one year. A more specific definition can be found in the section which describes the questionnaire development.

The major regulatory body of the Federal government for motor carriers is the Interstate Commerce Commission (ICC). The major industry association is the American Trucking Associations, Inc. (ATA).

General commodity carriers are those which carry almost any product imaginable and which service almost every city and town in the country. Special commodity carriers are just that: specialists. They may be household goods movers, heavy machinery movers or milk movers. For the purpose of this study we have two groups, general commodity carriers and all others.

Operating authority refers to the rights and routes granted to the carriers by the ICC through a certificate of authority. A carrier may only service those points for which it has rights. In some cases it may have rights to pass through an area but not be allowed to stop for pickup or delivery. For example, a carrier with rights from New York to Chicago must go through Ohio but does not necessarily have rights to deliver goods in Ohio. The expansion of a motor carrier often involves the acquisition of additional rights. Normally no new rights are issued by the ICC and expansion must be accomplished by purchasing them from another carrier or purchasing another carrier itself. Either way the ICC must grant approval for the expansion.

Plan of the Study

One substantial portion of the motor freight industry was chosen for this study: Class I motor carriers operating under ICC jurisdiction. These are essentially the largest carriers as measured by gross operating revenues. What is

even more important is that a great deal of information is available about these firms through the ICC, the industry association and other sources. Executive names and corporate addresses are public knowledge, and in addition annual financial information is available through the ICC and through Dun and Bradstreet publications.

Since the economic data is available without contacting any carrier directly, only the information about the long-range planning practices of the firm had to be obtained. This was accomplished by developing a questionnaire and sending it to all firms in the sample.

In order to elicit the greatest response, the questionnaire was mailed in official ATA envelopes to the president of each carrier. A cover letter encouraging cooperation was included which was signed by an official of the ATA. In addition a stamped return envelope was also enclosed. Non-respondents were sent a second mailing with another reminder from the ATA official.

For each of the carriers who responded, ten years' economic data (1965 to 1974) was generated by referencing the TRINC's Blue Book of the Motor Freight Industry. This is an annual publication of a Dun and Bradstreet subsidiary which publishes, for all carriers, ninety to one hundred elements of their performance.

In some cases it was necessary to supplement the information in TRINC's by using the ICC reference library

to obtain copies of the carrier's annual report.

With ten years' economic data and a classification of the carrier's planning practices over that ten-year period there was sufficient data with which to analyze the relationship between these two variables.

Limitations

Although there is much to be said for the interview method of gathering data, the number of carriers and their wide dispersion geographically made such an approach impossible. However, this limitation is mitigated by the author's own background and experience in the industry and his continual contact with carriers as a speaker at ATA meetings and as a consultant. Through these contacts, at least informal interviews and confirmations could be made.

In addition, though the questionnaire approach will sacrifice some of the completeness which may have been obtained through personal interviews, it allowed for a much larger sample to be surveyed. Also the effects of this loss are lessened by the objective nature of most of the data sought. The large sample size will enhance the statistical significance of the results and increase confidence in the generalizing of the conclusions.

An additional limitation was to exclude all but Class I motor carriers since less information is available on smaller carriers.

Before entering more fully into the investigation, it is necessary to firmly establish the strategic planning function in a theoretical framework in order to describe its relationship to other managerial functions and to other organizational activities. The next chapter provides this theoretical foundation.

CHAPTER II

THEORETICAL FRAMEWORK

Purpose

One purpose of this section is to show how General Systems Theory presents a perspective through which to view organizations. Then traditional and modern organization theories are discussed from the point of view of their perceptions of the organization as a system. Limitations of the traditional "closed" view are contrasted to the modern "open systems" perspective.

Further, the organization as an open system is described in more detail with particular emphasis on the managerial subsystem. This discussion centers on the decision making function and the theories applicable thereto. Planning emerges as a significant management function and a prime competitor with controlling and organizing for managerial time and attention.

General Systems Theory

General Systems Theory represents a way of thinking. It suggests that we look at the whole and its parts in relationship to one another, that we look at neither just the parts, nor just the whole, but at both in combination as

a system. Ackoff (1972) explains this concept and its evaluation as follows:

> In the machine age man sought to take the world apart, to analyze its contents and our experiences of them down to the ultimate invisible parts: atoms, chemical elements, cells, instincts, elementary perception, and so on. These elements were taken to be related by causal laws, laws which made the world behave like a machine. This mechanistic concept of the world left no place in science for the study of free will, goal seeking, and purposes . . . .
>
> With World War II we began to shift into the Systems Age. A system is a whole which cannot be taken apart without loss of its essential characteristics, and hence it must be studied as a whole. Now, instead of explaining a whole in terms of its parts, parts began to be explained in terms of the whole.

This point of view has been especially useful in the social sciences, where a functional approach has been used to analyze social and cultural life from the standpoint of wholes or systems (Johnson, Kast and Rosenzweig, 1973, P. 11). This functionalism emphasizes a system of relationships and the integration of parts and subsystems into a whole. Such a functionalistic point of view based in general systems theory offers a theoretical framework for the study of organizations (Johnson, Kast and Rosenzweig, 1973, p. 103).

In the next section this general system view and the functional approach will be applied to organizations as a basis for distinguishing between traditional and modern views of organizations and to define organizational components and the way they interrelate.

Systems Theory and Organizations

Traditional Theory

Traditional organization theory made major contributions to understanding organizations but also had serious deficiencies. Put in the perspective of the environment of the time in which it developed, it was a strong first attempt to solve those problems facing organizations of growing size and complexity. It attempted to define and conceptualize "principles" of management, and it focused on the key administrative problems of the time: structure, hierarchy, authority, specialization, span of control, and line and staff (Johnson, Kast and Rosenzweig, 1973, pp. 32-7). It predated the human relations and behavioral movement and was grounded in the physical sciences, engineering, and classical economics. And this is the problem. Traditional organization theory has adopted a relatively closed, mechanistic view of the organization. It does not fully consider environmental forces. It is as March and Simon (1958, p. 36) term it, "a machine model."

It is this closed nature of the organization which diminishes the value of traditional organization theory. Closing the organization or a closed system means that the unit has been isolated from the external environment (Richards and Greenlaw, 1972, p. 93). Neither matter nor information is exchanged with the outside environment. As a result such closed systems according to Katz and Kahn (1966, p. 19) have

a tendency toward entropy or death. They seek a static equilibrium, in an environment characterized by randomness and disorder.

Modern Theory

Modern organization theory has attempted to overcome the shortcomings of traditional theory by viewing the organization as an open system. Such a system "is in continual interaction with its environment and achieves a 'steady state' or dynamic equilibrium while still retaining the capacity for work and energy transformation" (Kast and Resenzweig, 1974, p. 110). In an absolute sense however, there are degrees of openness as certain aspects of the environment are often impeded from interacting with or upon the organization. The boundaries of the system will determine the extent of environmental interaction and thus the degree of openness.

Katz and Kahn (1966, pp. 19-26) present a comprehensive discussion of the characteristics of open systems. They are briefly described here. First is the importation of energy from the environment. Using this energy the system can then transform its inputs. The result of the transformation is some output to the environment. These three stages have a cyclic character such that we can expect a repetition of the functions as the system continues to exist. To achieve this continued existence or survival, the organization must

halt the entropic process mentioned above. It must acquire negative entropy, i.e., it must import in all forms greater amounts of energy than it returns to the environment as product (Katz and Kahn, 1966, p. 150). There is also an information element in open systems. They must have such inputs from the environment, particularly in the form of negative feedback, so that corrective action can be taken. Such inputs assist the organization in achieving a steady state. "There is a continuous inflow of energy from the external environment and a continuous export of the products of the system, but the character of the system, the ratio of the energy exchanges and the relation between parts, remains the same" (Katz and Kahn, 1966, p. 23).

In addition an open system must have a maintenance mechanism which keeps the various subsystems in balance, insures the perpetuation of the system, and regulates change in the system. Further, the system has adaptive mechanisms to provide a dynamic equilibrium, that is, a constantly changing state over time. Kast and Rosenzweig (1974, p. 117) agree that "the system must have adaptive mechanisms which allow it to respond to changing internal and external requirements." Katz and Kahn (1966, p. 39) comment more fully on these two mechanisms:

> If the system is to survive, <u>maintenance substructures</u> must be elaborated to hold the walls of the social maze in place. Even these would not suffice to insure organizational survival, however.

> The organization exists in a changing and demanding environment, and it must adapt constantly to the changing environmental demands. Adaptive structures develop in organizations to generate appropriate responses to external conditions.

Further, social systems have a tendency toward growth. They have excess capacity in their subsystems which create a pressure for growth, and they often try to encompass within their boundaries additional activities in order to limit uncertainties and to ensure their survival (Kast and Rosenzweig, 1974, p. 118). Lastly, open systems have the characteristic of equifinality, which simply means that final results can be achieved through different means. In other words, organizations can accomplish objectives with varying inputs and activities and are not restrained by the simple cause and effect relationships of closed systems (Kast and Rosenzweig, 1974, p. 119).

The Organization as an Open System

That an organization may be viewed as an open system should be quite clear from the previous discussion. It receives energy, materials and information inputs from the environment, transforms these, and returns outputs to the environment. In the words of Kast and Rosenzweig (1974, p. 111):

> Under this view an organization is not simply a technical or social system. Rather, it is the structuring and integrating of human activities around various technologies. The technologies affect the types of inputs into the organization,

> the nature of the transformation processes, and the outputs from the system. However, the social system determines the effectiveness and efficiency of the utilization of the technology.

Kast and Rosenzweig (1974, p. 111) elaborate further by defining five major subsystems within the organization. These are: 1) the goals and values subsystem; 2) the technical subsystem; 3) psychosocial subsystem; 4) structural subsystem, and 5) managerial subsystem. The goals and values subsystem describes the functions and purposes of the organization. These must conform to the environment, however. Technical subsystems provide for the transformation activities, whereas the psychosocial subsystem is concerned with group and individual behavior. Structural subsystems have to do with degrees of integration and differentiation in the organization. All of these four overlap with each other and interact with the environment. Finally, they are permeated by, influenced by and in turn influence, the managerial subsystem. "The managerial subsystem spans the entire organization by relating the organization to its environment, setting the goals, developing comprehensive, strategic, and operational plans, designing the structure, and establishing control processes (Kast and Resenzweig, 1974, p. 113).

These five subsystems parallel five offered by Katz and Kahn (1966, pp. 39-47). They suggest: 1) production or technical subsystems; 2) supportive subsystems; 3) maintenance subsystems; 4) adaptive subsystems, and 5) managerial

subsystems. Technical subsystems perform similarly to those proposed by Kast and Rosenzweig. Supportive subsystems carry on the interaction with the environment. Maintenance subsystems are concerned with human behavior and the survival of the organization. Adaptive subsystems provide for change. And the managerial subsystems are quite similar in concept. Katz and Kahn (1966, p. 42) support this view in their own words:

> These systems comprise the organized activities for controlling, coordinating, and directing the many subsystems of the structure. They . . . are made up of cycles of activities cutting across the structure horizontally to deal with coordination of subsystems and the adjustment of the total system to its environment.

Katz and Kahn (1966, p. 44) go on to describe as a significant feature of the managerial subsystem its authority structure. This is the way in which the system is organized with respect to decision making and implementation. There is some executive system for carrying out policy or the implementation of decisions. It is this managerial subsystem which is of most importance to the strategic planning process. In the next section this aspect of the organization will be discussed in detail.

The Managerial Subsystem

Background

The managerial subsystem pervades the entire organization. According to Churchman (1968, p. 8) "it is the

subsystem that thinks about the overall plan and implements its thinking." The managerial subsystem operates on three levels within the organization: 1) operating; 2) coordinative, and 3) strategic (Johnson, Kast and Rosenzweig, 1973, p. 17). On the operating level it seeks efficiency and effectiveness in the accomplishment of objectives. Through coordinative activities it seeks to integrate the internal activities of the system. And on the strategic level the goal of the managerial subsystem is to relate the organization to the environment and prepare a comprehensive system of plans. It is the strategic level which is emphasized in this study. Examined from the dimensions of environmental interaction, time, criterion of value and decision making, the strategic level appears as open to environmental interaction, concerned with the long run, satisficing its returns and dependent upon judgmental decision techniques (Kast and Rosenzweig, 1974, p. 121). This is in contrast to the other levels of the managerial subsystem which tend to be more closed, short run, optimizing and computational in nature.

This open systems view of the organization and the managerial process as a subsystem substantially changes the role of the manager from that described for him in traditional theory. Now the situations he faces are dynamic, uncertain and often ambiguous. He is not in full control of all the factors of production, and he is restrained by many environmental and internal forces (Kast and Rosenzweig,

1974, p. 123). As Leonard Sayles (1964, pp. 258-9) expresses it: "A system concept emphasizes that managerial assignments do not have those neat, clearly defined boundaries; rather the modern manager is placed in a network of mutually dependent relationships."

The organization represents the system to be managed. "This is accomplished via managers planning and controlling organizational endeavor (toward objective accomplishment) by means of an information-decision system" (Johnson, Kast and Rosenzweig, 1973, p. 18).

Decision Making

Decision making provides a sound viewpoint from which to examine the managerial subsystem. According to Kast and Rosenzweig (1974, p. 359) "Decision making is fundamental to organism and organization behavior. It provides the means for control and allows coherence in systems." In a sense all managerial activity is decision making. Herbert Simon (1960, p. 1) states: "What part does decision making play in managing? I shall find it convenient to take mild liberties with the English language by using 'decision making' as though it were synonymous with 'managing.'" The syllogism is completed by Kast and Rosenzweig (1974, p. 360), "If <u>all</u> behavior results from decision making and if management is a particular kind of behavior, then managing is decision making." Rather than describe the managerial

function as planning, organizing and controlling, as is often done, it would be more proper to look at management as decision making about planning, organizing and controlling.

Levey and Loomba (1973, p. 169) concur with this view, and they define a decision as "the conclusion of a process by which one chooses among available alternatives for the purpose of achieving a set of desired objectives." Archer (1964) describes the process referred to above in three steps: "1) the activities of discovering and defining things to decide about; 2) determining the objectives of the organization, and 3) the enumeration and preparation of the alternate ways of making a decision." At this point all that remains is the selection of the alternative that best meets the organization's objectives.

Planning

Realizing that the open systems view of the organization implies a planning function as part of the managerial subsystem in order to assist the organization in adapting to the environment, it is important to understand exactly what that function is. However, definitions of planning are either too simplistic--making decisions about the future--or too obscure--"any detailed method formulated beforehand, for doing or making something" (Webster's New World Dictionary, 1970, p. 1088). A better approach is to describe some of the characteristics of the strategic plan

and conclude that the best definition is one which reflects those characteristics.

According to Steiner (1969, p. 37) a strategic plan: 1) is conducted at the highest management level, 2) is prepared on a regular basis with provision for decisions as the opportunity demands, 3) is weighted with subjective values, 4) presents a large range of alternatives for management, 5) contains a high degree of uncertainty, 6) is concerned with unstructured and one of a kind problems, 7) requires large amounts of information (both internal and external), 8) covers a long time spectrum dictated by the subject, 9) covers the entire scope of the organization, 10) provides the framework for all other plans in the organization, 11) is contructed in a broad fashion, and 12) is rather difficult to evaluate.

Another way of defining strategic planning is through the process itself as described in Kast and Rosenzweig (1974, pp. 454-5):

> A logical approach to business planning would include the following steps:
>
> 1. Appraising the future political, economic, competitive, and technological environment.
> 2. Assessing the long-run values, interests, and aspirations of managers and other participants.
> 3. Visualizing the desired socioeconomic role of the organization in its future environment.
> 4. Analyzing the organization's resources and capabilities for fulfilling this desired role.

5. Designing a corporate strategy which matches the future environmental opportunity, values and aspirations, desired socioeconomic role, and organizational resources.

6. Developing specific objectives and strategic plans which will direct the efforts of the total organization.

7. Translating comprehensive plans into functional efforts on a more detailed basis--research, design and development, production, distribution, and service.

8. Developing more detailed planning and control of resource utilization within each of these functional areas--always related to the overall planning effort.

9. Providing a system of communication and information flow whereby organizational members can participate in planning processes.

10. Designing an information feedback and control system to determine the progress and problems in the implementation of plans.

Planning is essentially a decision function (Cleland and King, 1972, p. 122). Open organizations are so complex that managers need a framework for making decisions about them. Systems theory provides such a framework. The information decision system provides the means for carrying out the management task. "Planning is a key phase because it initiates behavior. Management is a continuing and sequential process of planning and implementing plans" (Kast and Rosenzweig, 1974, p. 452).

Problem Formulation

Modern management theory supports strategic planning. It requires it as a means of dealing with the uncertainties

of the external environment of the firm. Not all firms approach strategic planning with the same dedication and enthusiasm. It would therefore seem logical that similar firms with varying approaches to planning would have varying results. More specifically it would be expected that those firms which have the more sophisticated planning process would fare better economically than those who give that function lesser resources or none at all.

Expressed another way, the planning function is mandated by the open systems view of the organization. The more open the organization the more the need for planning. It would seem reasonable to expect those firms which adapt to the environment through strategic planning to succeed better economically than those which do not. The following hypotheses flow from these assumptions:

Hypothesis 1: There is a positive relationship between the degree of openness of the firm, its commitment to long-range planning and its economic performance.

Hypothesis 1a: Of the most highly open firms, those which have the greater commitment to planning have greater economic success than those with lesser commitments to planning.

Hypothesis 1b: Firms which are only somewhat (medium) open achieve greater economic success as they become more committed to planning. However,

they may reach a point where additional planning commitment results in no greater economic performance.

Hypothesis 1c: Firms which are only slightly (low) open achieve the same level of success no matter what their level of commitment to long-range planning.

Since motor freight operation is restricted to specific geographic areas and certain commodities it was necessary to test the following subsidiary hypotheses to determine if variation in geography or commodity affected planning and performance.

Hypothesis 2: The geographic area of operation of the motor carrier has no bearing on its economic performance relative to its degree of openness and commitment to planning.

Hypothesis 3: The kind of commodity handled by the motor carrier (general or specialized) has no bearing on its economic performance relative to its degree of openness and commitment to planning.

As explained later in the section titled "The Sample", only firms planning for ten or more years were included in the study. Therefore, it was believed to be important to determine if economic performance improved as experience with planning increased. As plans mature, does economic performance

improve? Hypothesis 4 addresses this sub-issue.

Hypothesis 4: When compared to non-planners in the same time periods, those firms performing long-range planning for ten or more years will perform better economically than those only planning five or more years.

CHAPTER III

METHODOLOGY

General Research Design

In order to test the hypotheses it is necessary to arrive at three basic measures: planning commitment, degree of openness and economic performance over a period. The planning commitment was measured through a questionnaire especially developed for this study. It divides the respondents into five groups representing no planning through four increasing degrees of commitment to planning.

Openness, or the measure of a carrier's interaction with the environment, was measured through a combination of the firm's characteristics representing various dimensions of that environment. These included the number of shipments, miles driven, and dollars spent on equipment, salaries, transportation, terminals, taxes and licensing fees. The result is three openness categories termed "high", "medium" and "low". High open firms have the greatest interaction with the environment, low open firms have the least, and medium open fall somewhere in between.

Economic performance was measured by five criteria: revenue growth, earnings growth, earnings/revenue ratio, earnings/total capital ratio, and earnings/equity ratio.

Growth rates were calculated over a ten year period for each of the responding firms.

The questionnaire was pre-tested on a number of firms and statistical analyses performed to insure the instrument's validity and reliability. Once this was satisfactorily accomplished it was necessary to obtain the assistance of the industry association, the American Trucking Associations, Inc. This is the organization to which all motor carriers belong and to which they look for guidance and counsel in many areas. It was logical to get an endorsement for this study from such a group in order to gain the respect, confidence and cooperation of the motor carriers who would be sent questionnaires.

Such an endorsement was forthcoming in the form of two letters, stationery and mailing labels. In addition, the weekly newspaper of the ATA ran a page one article about the study.

The approach was to mail questionnaires to each of the 886 Class I motor carriers, use the questionnaires as the basis of determining the firm's planning commitment and then gathering ten year's economic data about that firm. Provision was made for a follow-up questionnaire to be mailed to those who failed to respond to the first mailing. Once sufficient responses were received, statistical analyses were performed to test the hypotheses.

The Measurement of Openness

As shown in the theoretical framework, organizations interact with their environments. They receive inputs and provide outputs. Every organization has a domain, and according to Thompson (1967, p. 27) it is the "domain (which) identifies the points at which the organization is dependent on inputs from the environment. The composition of that environment . . . in turn determines upon whom the organization is dependent." This environment is described by Dill (1968) as the "task environment", that is, those parts of the environment which are "relevant or potentially relevant to goal setting and goal attainment."

Dill's (1968) task environment has four categories: customers, suppliers, competitors and regulatory groups. As Thompson (1967, p. 28) indicates, with appropriate modifications this task environment of Dill's is a useful concept to work with since it is much more limited in scope than the concept of environment. Thus the task environment is used to define the degree of openness of the firm. The more general and less specific environment is ignored since as Kast and Rosenzweig (1974, p. 137) state, "The individual organization while operating in the general environment setting . . . may not be directly influenced by nor can it respond to all these forces. The general environment is the same for all organizations in a given society. The task environment is different for each organization." My approach is to measure

the specific task environment for each motor carrier as a measure of its degree of dependence (openness).

For the motor freight industry there appeared to be a strong relationship between the size of the carriers, as measured in gross revenues, and the dependence on the task environment. In order to examine this relationship, a sample of fifty motor carriers ranging in gross revenue from $1,783,000 to $305,519,000 was chosen. To represent dependence on customers, the number of shipments for one year was used. For an expression of supplier dependence the aggregate dollars spent on equipment, transportation and salaries was calculated. The competitive dimension was measured through the total dollars spent on terminals since competitive posture of a carrier is reflected in the size, location and number of his freight terminals. Regulatory influence was represented by the amounts spent on taxes and licensing fees, as well as miles driven. The more miles driven, the greater the tax liability and the greater interaction with enforcement agencies. Miles is also a relative measure of competitiveness.

Scatter diagrams were made to display the relationship between gross revenue and the five summary surrogates for the task environment: terminal expense, taxes, miles, shipments and supplier expense. (See appendix G.) In all cases there was a distinct and clear linear (straight line) relationship. Since this was the case it was felt that

Pearson correlation analyses would be appropriate for further analysis. The results are displayed in table 1 and table 2. Table 1 shows the Pearson Product Moment Correlation Coefficient between revenue (REV) and each of the other five variables: terminal expense (TER), taxes (TAX), miles (MIL), shipments (SHP) and supplier costs (SPL). Table 2 shows the correlations of each variable with each other variable. In all cases the correlation coefficients were .96 or above with the most frequent being .99 and all were significant at the .001 level. This high relationship implies that the values for each of these variables vary similarly and therefore, it is acceptable to use one of them, gross revenue, to represent the others.

Measures of Economic Performance

There are many ways to measure economic performance for the firm. Ansoff (1965, p. 41) emphasizes that the selection of a measure of profitability (return on resources) rather than profit (excess of revenues over cost) is the more realistic method. Therefore, he offers long-term rate of return on the equity employed in the firm as the criterion of economic success. This reliance on resources reflects the fact that the firm's resources are not flexible and any change in the equity base generates costs to the firm. "In summary, the problem of the real-world firm is how to make available resources yield the best possible return, rather than to maximize profit on the assumption that the

TABLE 1

CORRELATION COEFFICIENTS FOR REVENUE AND FIVE OPENNESS VARIABLES*

	TER	TAX	MIL	SHP	SPL
REV	0.9961	0.9953	0.9945	0.9819	0.9960

*$p < 0.001$

TABLE 2

CORRELATION COEFFICIENTS AMONG
ALL OPENNESS VARIABLES*

	REV	TER	TAX	MIL	SHP	SPL
REV	1.0000	0.9961	0.9953	0.9945	0.9819	0.9960
TER	0.9961	1.0000	0.9895	0.9845	0.9899	0.9917
TAX	0.9953	0.9895	1.0000	0.9648	0.9705	0.9942
MIL	0.9945	0.9845	0.9948	1.0000	0.9660	0.9939
SHP	0.9819	0.9899	0.9705	0.9660	1.0000	0.9769
SPL	0.9960	0.9917	0.9942	0.9939	0.9769	1.0000

*$p < 0.001$

resource base can be adjusted at will" (Ansoff, 1965, p. 41).

Ansoff does not deny the existence of other objectives for the firm but in fact posits a "system of objectives" which include both economic objectives and "social" or non-economic objectives (1965, p. 38). However, he insists that the economic objectives exert the primary influence on management, and that the central purpose of the firm is to maximize long-term return on resources employed within the firm (1965, p. 38).

Steiner (1969, p. 372) endorses the use of return on investment (ROI) as a measure of economic success calling it "a well-used measure of managerial performance both for a company as a whole and for the individual organizational parts of it." The use of this measure is common in a great many studies seeking correlates to economic success (Fulmer and Rue, 1973; Ansoff, 1971; Thune, 1967; Paine and Naumes, 1974). Lawrence and Lorsch (1969, p. 39) express a preference for ROI but claim that such information was not available to them in their study.

However, to all of the researchers mentioned above, ROI is not a satisfactory measure of economic performance alone. Ansoff suggests measuring other characteristics of the firm which are representative of long-term ROI (1965, p. 50). These include: 1) sales growth, 2) market share, 3) earnings growth, 4) growth in earnings per share, 5) new

product additions, and 6) number of new customers. Lawrence and Lorsch (1969, p. 39) used sales growth, earnings growth and earnings/sales ratio. Each of the others used similar measures.

For this study it was decided to use the five most common measures and to measure each of them over a ten year time period. The five are: 1) revenue growth, 2) earnings growth, 3) earnings/revenue ratio, 4) earnings/total capital (return on total investment) and 5) earnings/equity ratio (return on shareholder's investment). Certain measures such as earnings per share and stock price were not included because of the preponderance of closely held corporations and partnerships which would make such data hard to obtain and perhaps harder still to interpret as a true economic measure.

The definition of revenue is the gross operating revenue of the firm. Earnings are net operating revenues before taxes. The earnings/revenue ratio is earnings divided by gross operating revenue. The two forms of ROI used are those suggested by Anthony (1970, p. 303). Return on shareholder's investment is net income divided by average shareholder's equity. Average shareholder's equity is computed by subtacting all liabilities from total assets.

Return on total investment is operating profit divided by the sum of average equity capital and average fixed liabilities. Operating profit is gross revenues less operating expenses.

Since these five measures were to be calculated as percentage increases or decreases over a ten year period, it was necessary to decide what averaging formula would be used. The basic formula employed was a weighted annual growth rate calculation. This took the form of the sum of the differences between successive pairs of years divided by the sum of the absolute value of each year except the most current year. For example, the weighted average for the period 1970 to 1974 would be calculated as follows:

$$\frac{(74-73)+(73-72)+(72-71)+(71-70)}{73 + 72 + 71 + 70}$$

This weighted average was chosen in favor is a simple average since the denominators were not equal. This method also avoids certain distortions when values are zero or very close to zero.

Though this formula was used with all five measures, it was decided to also calculate growth rates for two of the measures (earnings/revenue ratio and earnings/total capital ratio) with another formula. This is a method used by Ansoff (1971) to eliminate the effects of bias from only one type of formula. The formula used involves a simple average of the values. This is achieved by adding the values for each year and dividing by the number of years. Thus the final statistical analysis has seven economic data elements: all five measures calculated according to formula one, and two of the measures calculated according to formula two.

The Measure of Planning Commitment

The objective of the measure of planning commitment was to obtain in a simple and forthright fashion some indication of a firm's dedication to long-range planning. If this measure could be quantifiable so much the better. The few other researchers in this and related areas had used scales of their own to measure dimensions similar to this but for a number of reasons their scales or combinations of them were not satisfactory for this study.

Some of the above mentioned scales looked at the kinds of plans a firm used (Litschert, 1966; Ringbakk, 1968) rather than at commitment to planning. Others appeared to be too brief to encompass all the aspects of long-range planning (Fulmer and Rue, 1973; Thune, 1967). And others though they did seek to describe planning practices were too lengthy (Najjar, 1966; Guynes, 1969). In addition, none of these were validated or tested for reliability with much more than a pre-test for understandability. It was necessary, therefore, to develop a questionnaire specifically for this study.

The first step was to review the writing of experts in the field of planning and extract from them the elements of a long-range planning program. The basic definition of planning selected was found in Levey and Loomba (1973, p. 273):

> Planning is the process of analyzing and understanding a system, formulating its goals and objectives, assessing its capabilities, designing alternative courses of

> action or plans for the purpose of achieving these goals and objectives, evaluating the effectiveness of these plans, choosing the preferred plan, initiating necessary actions for its implementation, and engaging in continuous surveillance of the system in order to arrive at an optimal relationship between the plan and the system.

Steiner (1969, p. 19) elaborates on these somewhat when he includes as characteristics of plans, complexity, comprehensiveness, a qualitative aspect, written rather than unwritten, prepared formally, rational, flexible and always involving top management. It was these elements characterizing the long-range planning process that were reflected in the questionnaire developed as well as those described earlier in the section titled "Planning" in Chapter II.

Part I of the questionnaire (see appendix A) consists of five definitions of planning. This approach is similar to that used by Litschert (1966, p. 356). The respondent is asked to choose the definition of planning which most closely fits the kind of long-range planning performed in his company. If none of the definitions apply, there is a space provided for the respondent to describe what does take place. The distinction between the definitions is on two levels. Definitions A and B both describe formal planning systems, but B lacks the comprehensiveness of A. Definitions C and D describe informal planning systems with D being less comprehensive than C. Definition E admits to no long-range planning and those choosing that category were termed non-planners in this study.

As a check on the responses to Part I, as a means of adding face validity and as a source of subsidiary analysis, fifteen questions about the specifics of long-range planning were asked in Part III. The responses to these fifteen were made on a Likert-type scale. There were five possible responses for each question representing decreasing frequency of occurrence, i.e., A=always or very high occurrence, O=often or something less than always, P=periodically or some middle range of occurrence, S=seldom or not very frequent occurrence and N=never or hardly ever any occurrence at all. For scoring purposes these were scored five through one for A to N, although the scores did not appear on the questionnaire. The respondent was asked the frequency of occurrence in his firm of these fifteen items.

Some of these fifteen items are parallels to those in some of the scales mentioned above. In some cases phrasing has been modified to apply to the motor freight industry. But through all fifteen the essential elements of long-range planning as defined by Steiner, Levey and Loomba, Ansoff, Ackoff and others are reflected. There is the long-range aspect, top management involvement, the provision for a planning staff, goal setting, policy establishment, internal and external analysis, development of alternate plans, linkage with short run and tactical plans, written documentation, implementation planning, control systems and modification.

In addition to defining the planning in his firm the respondent is asked the year that such planning commenced. There is also some information collected about the board of directors and an option to indicate what person, by title, completed the questionnaire. This latter request is an attempt to encourage a top echelon respondent or at least one with a title to complete the questionnaire.

Questionnaire Development

Validity

In order to establish the validity and reliability of the questionnaire a pre-test was conducted. This consisted of administering the questionnaire to an executive and then interviewing him about his planning practices and the questionnaire. Through the assistance of the New Jersey Motor Truck Association (NJMTA) and other executives with whom this author was acquainted, 58 questionnaires were completed in this manner. The following is a description of the results of the analysis of these 58.

It is not my intention to discuss validity and reliability in great detail but some explanation is required to put these results in perspective. The first requirement aside from valid and reliable measurements was to have an understandable instrument. Through the interview technique confusing questions and terminology were discovered and corrections made. In addition, the questionnaire was also shown to people within and without the motor freight industry to insure its understandability.

This of course, did not indicate either validity or reliability. At best it inferred a kind of face validity, i.e. it appeared that the questionnaire was asking about planning practices and seemed to be thorough and complete. Although this is a worthy attribute, it alone does little for a questionnaire except to make the respondent feel that in fact he is answering questions about his planning practices.

The real question of validity is whether the questionnaire really measures commitment to planning. What may be inferred from the test (questionnaire) score? (American Psychological Association, Inc., 1974, p. 25) The APA manual adds (1974, p. 25) that "the measuring instrument is an operational definition of a specified domain of skill or knowledge . . . (the question is) how faithfully the score represents that domain." Though these definitions refer particularly to psychological constructs and the tests referred to examine human traits and behavior, the principles espoused do apply in some ways to a questionnaire that is seeking to measure a firm's planning commitment. Though in truth the planning commitment is an objective fact, it still must be shown that the questionnaire in fact reveals that fact.

The interest in this study is in concurrent validity. This means reflecting the <u>status quo</u> at a particular time (APA, 1974, p. 26). In other words, we wish to know, what the firm's planning commitment is now. We are not interested

in predicting its commitment in the future. According to Herold (1972, p. 92) "Two means of scale validity have been given credence in the social science literature." These are the multimethod approach and construct validation. This study uses a multimethod approach for establishing concurrent validity in the questionnaire but will present some evidence for construct validity as well.

The multimethod approach "determines the degree to which the properties which a scale purportedly measures vary in the same direction and magnitude as other measures of the same properties" (Herold, 1972, p. 92). Herold adds (1972, p. 92) that scales can be validated against observation, interview data, or experimental variations. Because of the nature of the subject both observation and interview data were used in this validation technique.

Once the questionnaire was administered to a respondent, an interview was held (see appendix B) to elicit his comments on the questionnaire itself and also to determine how closely the firm's actual planning practices were reflected in the questionnaire responses. Actual corporate plans were examined and company operations observed. This phase of the validation procedure was enhanced by the author's background and experience in the motor freight industry and his familiarity and past dealings with the very companies being observed. The general conclusion was that there was a high correspondence between what the respondent indicated

on the questionnaire and what was actually taking place in the organization. In many cases whatever discrepancies were noted were the result of definitional misunderstandings or interpretations of the questionnaire. These resulted in questionnaire refinements so that at the end of the pre-test, the questionnaire was "fine-tuned" to its present state.

Though Herold (1972, p. 93) claims that multimethod validity is usually considered a sufficient claim to scale validity, he notes that construct validity is regarded as necessary, but not a sufficient condition. "An hypothetical construct is an idea of an attribute or characteristic inferred from research" (Guion, 1965, p. 128). In psychology this refers to terms such as "anxiety" or "clerical aptitude", whereas in this study there is the construct of "planning commitment." "Construct validity is implied when one evaluates a test . . . in light of the specified construct (APA, 1974, p. 29). It is "the degree to which the variance in a given set of measures is due to variance in the underlying construct" (Guion, 1965, p. 128).

The notion that construct validity is implied is an important one. Guion (1965, p. 128) says that construct validity "must be expressed as a judgment, inferred from the weight of research evidence gathered in many independent studies." Guion concludes " . . . construct validity operationally is a judgment that a test does in fact measure

a specified attribute, or construct, to a significant and appreciable degree . . . " (1965, p. 129).

The underlying constructs in this questionnaire have all been excerpts from the classical definitions of the characteristics of long-range planning. This judgment of experts establishes the criteria for judging the degree of existence of a formal long-range planning process. The degree of adherance to the criteria represents the degree of commitment to the process. In addition, the bases for the items in this scale are the previous studies mentioned above. This constitutes to a degree the research evidence from previous independent studies which Guion asks for. Those researchers and respondents gave their judgment to the validity of their scales. This scale is a refinement of theirs and beneifts from their experience. As stated earlier, this does not represent a complete case for construct validity. But as Guion has said, "The process of construct validation is a continuous one" (1965, p. 129). The case for concurrent multimethod validity is clear. The case for construct validity is in process.

Reliability

Reliability is the consistency of measurement (Guion, 1965, p. 29). It is repeatibility. It answers the question of whether one always gets the same measurement with the instrument under the same circumstances. Specifically,

it is the extent that the scale is free from random error variance. Though Guion (1965, p. 31) states that "If a test is valid enough for its purpose, one need not worry much about its reliability," a number of measures were performed to insure the reliability of the questionnaire used in the study.

"Classical methods of estimating reliability coefficients call for correlating at least two sets of similar measurements" (APA, 1974, p. 48). One method of doing this is to give the same test twice with a time lapse in between. To do this was impractical in this study so the method used was an immediate re-test with parallel or equivalent forms. That is, the questionnaire had two sets of questions which asked the same thing or were selected according to the same specifications. A high degree of correspondence among the responses to the two sets would term the questionnaire reliable. The specific procedures are outlined below.

Section I of the questionnaire with its five definitions of long-range planning and section III with its fifteen characteristics of planning were matched against each other to establish scale reliability. The first test was a Pearson Product Moment Correlation Coefficient (PPMCC) of the relationship of the category chosen in section I against each of the fifteen responses in section III. All correlations were significant at the .001 level with the exception of item two of section III which was significant

at the .004 level. The conclusion is that there is a high correspondence between the category chosen in section I and the responses in section III.

The second approach was to calculate the PPMCC for the chosen category in section I and the total score achieved in section III. The result was an r of .7727 which was significant at the .001 level. The conclusion here is that the score does reflect the planning category (definition) chosen.

The third procedure was a PPMCC to obtain the inter-correlation of all fifteen responses in section III. Most of the correlations, 176 out of 210, were significant at the .001 level. None was higher than .05, meaning that the responses do reflect some stratification in the planning sophisitication of the respondent.

As a further check a series of chi-square analyses were performed to test the null hypothesis that there was no difference in the response (patterns) of the various groups of respondents according to their selection of a category in section I. In all cases the null hypothesis was rejected at the .001 level indicating that in fact respondents with total scores in section III in a certain range reflect certain categories in section I.

Finally, a test of the significance of the difference between two means was performed for each of the five categories in section I. The comparison was between the actual

means obtained from the pre-test respondents based on their responses in section III against the means of the expected scores in that category. In all cases the null hypothesis of the scores being from the same sample was accepted. This indicates that respondents in a given category in section I were responding to the questions in section III in such a way as to achieve a total score in the predicted range. This is another indication of a strong relation between the scores in section I and section III.

The conclusion of all these tests was that the questionnaire designed for this research did measure planning commitment and did discriminate between levels of that commitment. Thus, with a valid and reliable instrument, the next step was to administer the questionnaire to the sample and collect the data.

Data Gathering

As mentioned earlier, the success of the data gathering operation depended very heavily on the cooperation of the American Trucking Associations. The ATA, convinced of the value of such research, responded by providing letters to accompany the questionnaire urging their members cooperation (see appendices C and E) and also by providing large size mailing envelopes in which the letter and questionnaire would be sent. In addition they also provided two sets of pressure-sensitive mailing labels addressed to the president of each Class I carrier.

The major objective of the mailing was to elicit the greatest total response. It was for this reason that the questionnaire was kept to two sides of one page. The desire was not to overwhelm the recipient with a massive questionnaire. The questionnaire was printed by a professional printer after it had been set in type by a professional typesetter. Though this added to the expense, it was worth it in order to give a "professional" appearance to the scale. It was important that the respondent take the survey seriously. It was also important for me that I represent myself well since the ATA was endorsing what I was doing. Over all the questionnaire was neat and attractive and great advantage was taken of the use of bold face type and different type sizes.

Addressing the envelope to the president was an attempt to get the letter some attention and also get the response from a high level executive if not the president himself. Using ATA envelopes it was felt would get more attention than using plain envelopes with either a box number or the author's name as the return address. The use of large (9x12) envelopes avoided having to fold the letters and made a neater set of materials for the recipient. However, it added to the mailing cost.

Included with each letter and questionnaire was a stamped return envelope. This envelope was addressed to the author. It was also printed by a professional printer

for reasons similar to those above. In addition each return envelope was stamped with a large commemorative stamp. Stamps were used rather than meter postage to instill in the recipient that this was a personal response to the author and that he would be "wasting" the stamp if he discarded the questionnaire. It was felt that the meter would look too business-like and would not generate this "sympathy." To support this philosophy the largest and most attractive stamps available were used.

The initial mailing to all carriers was made on the same day. Two days later the first responses were received. (See table 3 for the response frequency by day.) On the Monday following the first mailing, a first page article appeared in Transport Topics, the weekly newspaper of the ATA, which is received by all motor carriers. The article described the survey and research and encouraged members to be on the lookout for their questionnaires. (See appendix D.)

One month to the day after the first mailing, a second mailing was sent to those carriers who had not responded to date. The timing of the second mailing was dictated by the trailing off of responses to the first mailing. It had always been planned to have a follow-up mailing but the timing was left to the circumstances. This mailing was also accompanied by a letter from the ATA (see appendix E). It referenced the first mailing and also included a copy of the original letter. Of course, a questionnaire and a stamped return envelope were also included.

TABLE 3

QUESTIONNAIRE RESPONSE FREQUENCY

Day	Number Received	Cumulative Number Received	Day	Number Received	Cumulative Number Received
1	3	3	31	2	266
2	4	7	32	6	272
3	24	31	33	Sunday	
4	57	88	34	9	281
5	Sunday		35	6	287
6	61	149	36	25	312
7	9	158	37	56	368
8	14	172	38	32	400
9	27	199	39	18	418
10	18	217	40	Sunday	
11	7	224	41	22	440
12	Sunday		42	1	441
13	6	230	43	8	449
14	0	230	44	11	460
15	3	233	45	12	472
16	7	240	46	5	477
17	4	244	47	Sunday	
18	3	247	48	Holiday	
19	Sunday		49	5	482
20	2	249	50	2	484
21	1	250	51	6	490
22	2	252	52	1	491
23	2	254	53	2	493
24	3	257	54	Sunday	
25	2	259	55	2	495
26	Sunday		56	1	496
27	0	259	57	0	496
28	0	259	58	0	496
29	1	260	59	1	497
30	4	264	60	1	498

Of the total mailing 276 responses were to the original mailing and 222 were from the follow-up mailing. The last response was received one month after the follow-up mailing went out. In order to insure that the responses from the original mailing and the follow-up mailing were similar, a series of Chi-square tests were run on the responses, testing the hypothesis that those responses do come from the same sample population. In all cases the hypothesis was accepted. What this means is that no particular size of carrier or any particular kind of planner was more prevalent in either the original or follow-up set of responses.

Each questionnaire contained a control number. Otherwise there was no identification of the respondent unless he chose to identify himself on the reverse side where his title was requested. This control number corresponded to a master list which provided the author with the name of the carrier. It was essential that we have the carrier name since a vast amount of data about the carrier's economic performance had to be generated once he responded, and this necessarily had to be linked to his questionnaire responses.

For each respondent a tally sheet was completed (see appendix F). This indicated the company name, control number, and the date the completed questionnaire was received. At this point it was necessary to "score" the questionnaire. This consisted of determining whether questions I, II and III were completed. These were the most essential to the survey.

Then the score of question III was calculated giving each response a 5 through 1 as described in an earlier section. The planning category, the year commenced planning and this raw score were entered on the tally sheet.

The remainder of the information on the tally sheet was obtained primarily from Trinc's Blue Book of the Trucking Industry. This publication provides economic performance data on each motor carrier as well as certain ownership information and operating information. It was from this source that the commodity carried, either general or specialized and the geographic territory covered was obtained. In addition using each annual publication from 1965 through 1974 the economic data of net worth, debt, gross and net revenue, net income and operating revenues as a percent of net revenues were entered on the tally sheet. Certain of the Blue Books needed were available from the ATA library in Washington, and others were obtained from a nearby carrier who was generous enough to lend them and from a private individual who lent me three of his personal copies. What little information could not be obtained from Trincs was obtained by going to the Interstate Commerce Commission in Washington, D.C. The information sought on these occasions consisted mainly of an occasional motor carrier listing which was omitted from Trincs because there was some delay in filing his annual report with the ICC. All the data in Trincs comes from the annual report the carriers must make to the ICC.

My preference is for Trincs rather than the ICC reports since Trincs presents the data in a much more usable form.

Once the economic data was collected on all the respondents it was necessary to apply the formulas to it to reduce it to percentage increases or decreases over the ten-year period. To do this a mini-computer was employed. Data was entered through a Cathode Ray Tube (CRT) and stored on a removable disc pack. One record was set up for each carrier and all the information on the tally sheet was keyed into that record. Then in order to verify its accuracy every element of data was printed out from the computer and manually checked against the tally sheets. Once verified as accurate the formulas were applied and seven measures of performance printed out for each carrier. These were then punched into eighty column data processing cards and used as input to the Baruch College (CUNY) computer system using the Statistical Package for the Social Sciences (SPSS).

A further use of the mini-computer was to provide a listing of the carriers in sequence by their gross revenue performance. This gross revenue figure was shown previously to be an indicator of the openness of the firm. With this gross revenue analysis it was found that the carriers fall into three logical categories. There were a large number of carriers doing under $10 million in annual revenues, (152), 59 were doing over $30 million and the remainder (87) were in between.

With the data thus reduced to cards and ready for SPSS and all the responses in and recorded, only the statistical analysis remained.

CHAPTER IV

FINDINGS

Preliminary Data Analysis

With the exception of some chi-square analyses and the calculation of some variations which were both done by hand, all statistical analyses were performed using the Statistical Package for the Social Sciences as available through the Educational Computer Center at Baruch College (CUNY). This package is supported by a text of the same name authored by Nie, Hull, Jenkins, Steinbrenner and Bent (1975). References to both the statistical package and the text will be shortened to "SPSS" for ease of reference. Text references will be accompanied by appropriate page notations.

The SPSS text (Nie et al., 1975, p. 4) makes a distinction between the social sciences and others. This two-level distinction is in the nature of the research questions which each answers and also in the nature of the data which each uses. We have said much about the research question; it is the nature of the data which is discussed here.

The most basic information that a researcher must have before selecting the statistical techniques that will be applied to the data is the level of measurement of each of the variables in the user's data set (Nie et al., 1975, p. 4).

The levels of measurement are designations which distinguish data on the basis of their ordering and distance properties. Knowledge of what properties apply to what levels is important to the researcher since different statistical techniques are appropriate for different levels of measurement.

S. S. Stevens (1946) developed the traditional four level typology of measurement levels: nominal, ordinal, interval and ratio. These are defined further in the SPSS text (Nie et al., 1975, pp. 4-5). However, there are variations on Stevens typology, and it is important to mention them here. First, however, it is necessary to describe the data in this study. The three major variables are economic performance data, degree of openness as measured by gross revenues and planning commitment as measured by planning score of planning category chosen.

The first one may easily be described as ratio level data. This means it carries the property of ordinal level data in that ranking is inherent in it, and also it has the properties of interval level measurement of fixed and equal distances between categories. But additionally, this data has a natural zero point. This should be obvious since we are working with dollars or percentage increases and decreases. The natural zero point allows such statements as the firm making a profit of $100 is twice as profitable as one making only $50. Or by the same token it makes sense to say that the firm with ten percent ROI is only one-third the performer

as the firm with a thirty percent ROI.

That these data are ratio level means that a great many statistics are appropriate for them. This is also true for interval level data (Nie et al., 1975, p. 5). The problem then lies with the planning commitment variable and the openness variable. If we use the planning category of one through five as the planning variable and gross revenue as a measure of openness we can see that they most certainly have ordinal properties. But do they have interval properties? Is it proper to say that a planner in category five is equally higher than one in category four as a category three planner is to a category two planner? Or is a ten million dollar carrier twice as open as a five million dollar carrier? There are a number of answers to this dilemma and they are discussed here.

The easiest solution is to dichotomize the data. A dichotomy is a variable with only two possible categories and for much of the analysis the planning dimension was divided into planners and non-planners as the only two groups. This was done by taking all those who chose category one and calling them non-planners and placing all others in the planner category. Since any dichotomy can be treated as though it were an interval level measure (SPSS, Nie et al., 1975, p. 5), a full range of statistics could be used.

A second solution is to expand the typology to include Coombs' (1953) category of ordered metric level of measurement.

This falls between the ordinal and interval levels and " . . . consists of ordered categories where the relative ordering of the intercategory distances is known even though their absolute magnitude cannot be measured" (Nie et al., 1975, p. 6). In this method the distances between categories are established on a relative basis through judgment. In the case of the planning categories it was the intent in setting them up that the interval between them be approximately equal and that is the interpretation given to them to make them an ordered metric scale. For openness, three groupings of high, medium and low were judged to be appropriate. "Abelson and Tukey (1959) argue that the proper assignment of numeric values to the categories of an ordered metric scale will allow it to be treated as though it were measured at the interval level" (Nie et al., 1975, p. 6).

A third solution denies the existence of the problem altogether. "Labovitz (1970) goes further by arguing that, except for extreme situations, interval statistics can be applied to <u>any</u> ordinal-level variable" (Nie et al., 1975, p. 6). In addition the SPSS authors themselves admit that although the various statistics make assumptions about the distribution of the data "These assumptions are so often violated (often with justifiable reasons) during the process of data analysis that their utility is questionable" (Nie et al., 1975, p. 6). The power of the statistic seems to outweigh the stretching of an assumption about the data. In the final

analysis the authors conclude "It remains (the) responsibility (of the researcher) to select an appropriate statistic and to interpret the results in light of the nature of the data" (Nie et al., 1975, p. 6).

In spite of the fact that the data analysis would seem to conclude that all three major variables could be considered to be at least ordered metric level measures and therefore appropriate for most statistics, this study has not limited itself to just those. This seemed to this author a defect of previous studies. They were either heavily correlational or just used analysis of variance with an occasional regression analysis. I test both the data attributes and contents through a series of tests using both parametric and non-parametric statistics.

The first analysis consists of displaying the relationship between the variables being analyzed on a scatter diagram. This presents a graphic idea of how the variables interact. Next, means and standard deviations are run. This gives some indication of the stability of the data and has an important bearing on the results of subsequent analyses as will be shown later. Then further tests are made using multiple and simple regression and correlation techniques, partial correlation analysis, one way analysis of variance, chi-square, t-tests and variations. Each of these is explained in more detail as the findings are explained.

The Sample

As shown in table 3, a total of 498 responses were received to the mailings. This represented a response of 56.2 percent of the 886 firms polled. Of these 498, twenty were completely unusable. Of the remaining 478 complete economic data for the full ten year period (1965 through 1974) could not be obtained for 93 respondents. This left 385 fully completed questionnaires with full ten year economic data. Of these, 298 started planning in 1965 or before and the others started in the years 1966 through 1975. The 298 which started planning in or before 1965 constituted a rather large homogeneous group and are the basis for this study. The others, though providing some interesting low level information are too small a sample from any one year to be usable in the major analysis.

The number of carriers in each planning group and the year in which they commenced planning are shown in table 4. Note that planning category number one, the non-planners, must necessarily fall into the 1965 (and prior) category. This figure includes all 478 usable questionnaires even though full economic data may not have been available for the carrier. The extremely large number of carriers in the 1965 or earlier group supports the contention that the industry and its management practices are somewhat static.

Table 5 shows the breakdown of planners by commodity handled and includes all 478 respondents. The categories are

TABLE 4

NUMBER OF CARRIERS BY PLANNING CATEGORY
AND YEAR COMMENCED PLANNING

Year Commenced Planning	Planning Category					Total
	1	2	3	4	5	
1965 or before	128	99	65	19	36	347
1966		1	1			2
1967		2	2	2		6
1968		3	4		1	8
1969		1	4		3	8
1970		11	9	5	3	28
1971		4	2		3	9
1972		9	9	3	12	33
1973		2	7	5	4	18
1974		3	3	1	4	11
1975			3		5	8
Total	128	135	109	35	68	478

TABLE 5

NUMBER OF CARRIERS BY PLANNING CATEGORY AND COMMODITY HANDLED

Commodity	Planning Category 1	2	3	4	5	Total
01 General	61	73	48	18	39	239
02 Household	5	5	6	3	3	22
03 Machinery	2	6	6		2	16
04 Liquid Petroleum	14	12	6	2	6	40
05 Refrigerated Liquid	1		1			2
06 Refrigerated Solid	9	6	14	2	2	33
07 Dump Trucking			2	1		3
08 Agricultural	3	3	1			7
09 Motor Vehicles	3	2	4	4	2	15
10 Armored Truck						
11 Building Materials	5	4	4		1	14
12 Films		1				1
13 Forest Products		1				1
14 Mine Ores						
15 Retail Store Dely	1	3	1		1	6
16 Explosives		1				1
17 Miscellaneous	24	18	16	5	15	78
Total	128	135	109	35	71	478

the ones used by Trincs (1972, p. 2) Table 6 shows the planning groups on a geographic basis. The groupings represent combinations of the Trincs territories, but only the general commodity carriers are represented and only those with complete economic data.

The openness analysis is displayed in more detail in table 7. The size of the carriers in total gross revenues is displayed as well as the number achieving that level and the cumulative number in the sample. The resultant grouping was 59 high open firms, 87 medium open and 152 low open.

Table 8 summarizes the breakdown by planning category for the entire response set, for the usable sample of 298 and then for the low, medium and high open firms. In addition the totals for general and special commodities are shown as they apply to the usable sample, and the geographic totals are included as well. It should be noted here that when dichotomous analyses were made, planning group one was matched against the total of the other four groups. In some instances however, planning group one was matched against only group five planners to get the results of an extreme comparison. Sometimes a trichotomous analysis was performed with group one being tested against group two and three combined and group four and five combined. If nothing to the contrary is noted, whenever an analysis or set of results is described it should be assumed that the full sample of 298 was used and that all five planning categories were used.

TABLE 6

NUMBER OF CARRIERS BY PLANNING CATEGORY
AND GEOGRAPHIC TERRITORY

Territory	Planning Category					Total
	1	2	3	4	5	
Eastern	10	11	9	3	5	38
Central	18	21	7	3	4	53
Southern	7	7	5	3	4	26
Western	15	12	4	3	5	39
Transcontinental	4		3		1	8
Total	54	51	28	12	19	164

TABLE 7

CARRIER ANNUAL GROSS REVENUE ANALYSIS (1974)
(Money Amounts in Millions of Dollars)

Gross Revenue	Number of Carriers	Cumulative Total
Over 100	15	15
90-100	2	17
80-89	3	20
70-79	3	23
60-69	6	29
50-59	5	34
40-49	8	42
30-39	17	59
20-29	21	80
10-19	66	146
Under 10	152	298

TABLE 8

SUMMARY OF NUMBER OF CARRIERS BY PLANNING CATEGORY WITHIN ALL SAMPLES

Sample	Planning Category					Total
	1	2	3	4	5	
All Respondents	128	135	109	35	71	478
Major Sample	111	84	55	17	31	298
High Open Firms	12	17	8	7	15	59
Medium Open Firms	33	26	13	7	8	87
Low Open Firms	66	41	34	3	8	152
General Commodity	55	54	26	12	17	164
Special Commodity	56	31	29	5	13	134
Eastern	10	11	9	3	5	38
Central	18	21	7	3	4	53
Southern	7	7	5	3	4	26
Western	15	12	4	3	5	39
Transcontinental	4		3		1	8

Findings Relative to Hypothesis 1

Hypothesis 1 stated that a motor carrier's economic performance is some function of its planning commitment and its degree of openness. The appropriate statistic for examining such a set of variables is multiple regression analysis. "Multiple regression is a general statistical technique through which one can analyze the relationship between a dependent . . . variable and a set of independent . . . variables" (Nie et al., 1975, p. 321). The dependent variable in this study is the measure of economic performance. Since there are seven different measures of economic performance, all statistics are performed seven times. The independent variables are planning commitment and openness.

The major multiple regression used planning category as the indicator of planning commitment and the gross revenue of the carrier as the indication of its openness. It is felt that using gross revenue allows for a greater number of data points for the openness variable and thus adds to the precision of the calculations. The results are summarized in table 9. In all but one case (Earnings/ Sales ratio: formula 2) the F values were not significant. In the one significant case the F was 4.05 with a probability of between .01 and .025. In this case also the R^2 was only .02672. Although there was some significance, the conclusion is that the relationship is weak and barely more than two percent of the variation in the earnings/sales ratio is

TABLE 9

MULTIPLE CORRELATIONS AMONG PLANNING AND OPENNESS FOR EACH ECONOMIC CRITERION

	Sample							
	All Firms N=298 df=2/295		High Open Firms N=59 df=2/56		Medium Open Firms N=87 df=2/84		Low Open Firms N=152 df=2/149	
Economic Criterion	R^2	F	R^2	F	R^2	F	R^2	F
Revenue	.01242	1.85	.00113	0.03	.01194	0.51	.09448	7.77**
Net Revenue	.00041	0.06	.00356	0.10	.01598	0.68	.04007	3.11*
Earnings/ Revenue(1)	.00422	0.63	.01254	0.36	.01123	0.48	.01735	1.32
Earnings/ Revenue(2)	.02672	4.05*	.03484	1.01	.00286	0.12	.00887	0.67
Earnings/ Capital(1)	.00579	0.84	.01897	0.54	.03762	1.64	.02826	2.17
Earnings/ Capital(2)	.00231	0.34	.02163	0.62	.03995	1.75	.00297	0.22
Earnings/ Equity	.00463	0.69	.01740	0.50	.01910	0.82	.01924	1.46

*$p < 0.05$

**$p < 0.01$

explained by planning commitment and openness operating jointly.

As a further analysis of this one significant statistic, a partial correlation analysis was performed, first controlling for planning and then controlling for openness. (See table 10.) "Partial correlation provides the researcher with a single measure of association describing the relationship between two variables while adjusting for the effects of one or more additional variables" (Nie et al., 1975, p. 302). When controlling for planning, openness showed a value of .1488 which was significant at the .005 level. Planning showed a value of .0279, significant at the .316 level. Thus the contribution of openness (or size) is much greater than a commitment to planning, even though both effects taken together are significant.

As a further analysis, the sample of 298 was stratified into groups of high, medium and low openness. Then each group was processed separately through the multiple regression program. The results are displayed in table 9. For the high and medium open carriers there were no significant relationships. Planning and openness did not contribute significantly to economic performance. The same result was true for low open firms with the exception of two economic measures: gross revenue and net operating revenue. The former had an F-value of 7.77 and an R^2 of .09448 and the latter had an F-value of 3.11 and an R^2 equal to .04007.

TABLE 10

PARTIAL CORRELATION COEFFICIENTS
FOR SIGNIFICANT F-VALUES

	Significant F-Values					
	Earnings Revenue(2) (All Firms)		Revenue (Low Open Firms)		Net Revenue (Low Open Firms)	
Values	Control For Plan Group	Control For Openness	Control For Plan Group	Control For Openness	Control For Plan Group	Control For Openness
r	.1488	.0279	.3045	.0386	.1261	.0330
p	.005	.316	.001	.319	.061	.344

The partial correlations on these variables also showed the contribution of size to be more important than that of planning.

This finding is one of the most important of the study. Theory would lead one to expect that the smaller firms (low open) would have a lesser need for planning and therefore could achieve higher levels of economic performance with lower levels of planning. However, the results are somewhat the opposite. Among the 152 smallest carriers, those with the higher level of planning and the larger gross revenues had the greater ten-year growth in gross and net revenue. On the other hand such a relationship does not apply to medium or large carriers. But even these signicant results only account for a little over nine percent in the variation in gross revenues.

In order to investigate further the results discovered with the basic analysis, additional multiple regressions were performed. The dependent variable was always one of the seven different economic performance indicators. However, different representations were used for the independent variables. In one set the openness code of a one, two or three was substituted for the gross revenue. In another the planning (raw) score from section three was substituted for the planning group. A third variation included trichotomizing planning into three categories and finally dichotomizing planning into just two groups. All these

variations were performed for the entire sample and for each of the three openness groups. In all cases the results were similar to those already discussed. As for the significant relationships for gross revenue and net revenue in the smaller planners, these were even more significant when planning was dichotomized.

To better understand the variables in the study, Pearson Product Moment Correlation Coefficients (PPMCC) were performed among them. Table 11 displays the resulting correlations. The first set is the correlation of all five planning groups to each of the seven economic variables. The next group is the relation between a dichotomized planning score and economic performance. Then there is a breakdown for low, medium and high open firms and the relation of their planning categories to economics. The second section of the table relates gross revenues to economic performance, first for all in the sample and then for the low, medium and high openness groups. As can be seen, none of the relationships are very strong and none are significant at the .05 level or below. These same results were found when other variations were employed, such as planning score rather than planning group and by dichotomizing and trichotomizing planning group.

Continuing the analysis of the major variables a series of one-way analyses of variance was performed to test the hypothesis that the sets of data came from the same population. The dependent variable was the economic

TABLE 11

PEARSON CORRELATION COEFFICIENTS BETWEEN VARIOUS PLANNING AND GROSS REVENUE GROUPINGS AND EACH ECONOMIC CRITERION

Sample Group	Economic Criterion							
	Revenue	Net Revenue	Earnings/ Revenue(1)	Earnings/ Revenue(2)	Earnings/ Capital(1)	Earnings/ Capital(2)	Earnings/ Equity	N
All Five Planning Groups	.029	.013	.023	.068	.012	.041	.068	298
Two Planning Groups	.027	.014	.047	.003	.042	.074	.038	298
Low Open Firms 5 Planning Groups	.044	.051	.088	-.093	.123	-.052	-.020	152
Medium Open Firms 5 Planning Groups	-.097	-.122	-.093	.053	-.171	.129	.025	87
High Open Firms 5 Planning Groups	-.033	.058	.078	.163	.062	.064	.095	59
Gross Revenue All Firms	.111	.018	-.052	.161	-.069	.035	.023	298
Gross Revenue Low Open Firms	.305	.194	.100	.113	.117	.012	.136	152

TABLE 11--Continued

Sample Group	Economic Criterion							
	Revenue	Net Revenue	Earnings/ Revenue(1)	Earnings/ Revenue(2)	Earnings/ Capital(1)	Earnings/ Capital(2)	Earnings/ Equity	N
Gross Revenue Medium Open Firms	.028	-.057	-.068	.008	-.125	-.121	-.127	87
Gross Revenue High Open Firms	.0006	-.0005	-.067	-.009	-.113	.140	-.076	59

performance value and the independent variable was planning group, openness and then variations on these two major variables. The results at best are mixed. (See table 12.) In only two cases (earnings/total capital ratio (2) and earnings/equity) does planning make a significant distinction in performance. When openness is the independent variable revenue and earnings/revenue ratio (2) are significant. However, when highly open firms are examined alone according to their planning group, there are no significant results, for medium openness only earnings/total capital (2) is significant, and for low openness only earnings/revenue (1) is significant. When only the low and high open firms are matched, the extreme comparison results in revenue and earnings/revenue (2) being highly significant.

There seems to be no really consistent pattern in these results. Certain strong relationships appear under certain conditions. But it would be risky to generalize from such results.

To approach the analysis with an ordinal level statistic two chi-square analyses were performed. The first contingency table matched the five planning groups against the three openness categories. (See table 13.) The null hypothesis was that there was no difference in planning commitment relative to corporate size or openness. This hypothesis was rejected at the .00001 level. It was apparent from the analysis that the largest firms most often were the

TABLE 12

ANALYSIS OF VARIANCE RESULTS FOR EACH ECONOMIC CRITERION AND VARIOUS PLANNING AND OPENNESS GROUPINGS

	F-Value					
Economic Criterion	Five Planning Groups N=298 df=4/293	Three Openness Groups N=298 df=2/295	High Open Firms 5 Planning Groups N=59 df=4/54	Medium Open Firms 5 Planning Groups N=87 df=4/82	Low Open Firms 5 Planning Groups N=152 df=4/147	Two Openness Groups (Low/ High) N=211 df=1/209
Revenue	.50	3.087*	1.140	2.036	.949	4.316*
Net Revenue	.08	.981	1.362	.579	1.986	.085
Earnings/ Revenue(1)	.76	1.756	.899	.214	2.453*	.759
Earnings/ Revenue(2)	1.21	5.267**	.615	.497	1.012	11.543**
Earnings/ Capital(1)	.80	.832	.762	1.265	1.556	.838
Earnings/ Capital(2)	3.85*	2.506	.699	2.716*	1.961	.288
Earnings/ Equity	3.618**	1.457	1.646	.378	.193	1.610

*p < 0.05
**p < 0.01

TABLE 13

CHI-SQUARE CONTINCENCY TABLE: FIVE PLANNING GROUPS VS. THREE OPENNESS GROUPS

	Planning Group					
Openness Group	1	2	3	4	5	Total
Low Open Firms	66	41	34	3	8	152
Medium Open Firms	33	26	13	7	8	87
High Open Firms	12	17	8	7	15	59
Total	111	84	55	17	31	298

NOTE: df=8

Chi-square=34.12788, reject Ho at .00001 level

most sophisticated (category five) planners. Conversely, of the non-planners, the largest percentage is from the smallest firms. These findings were confirmed by performing other contingency tests trichotomizing and dichotomizing the planning variable.

The second chi-square was a series of tests of each of the economic variables and planners and non-planners. In all cases, for all variables, the null hypothesis that there was no difference in economic performance by planners and non-planners was accepted. These results confirm those already established by the previous analyses.

A further variation on the above analyses was to perform a series of t-tests. The hypothesis to be tested was as follows: as planning commitment increases, economic performance (as reflected in the t-value) will improve. In other words group five planners should do much better compared to non-planners than group four planners. Likewise group four should do better than group three when compared to non-planners and group two should have the lowest score when compared to non-planners. These tests were performed for each openness group separately. (See tables 14, 15 and 16.)

For low open firms (table 14) the difference between the F-values of group 1-2 and group 1-5 show an improvement in five of the seven cases. Only earnings/revenue and earnings/equity show counter trends. However, the pattern

TABLE 14

t-TEST FOR DIFFERENCE IN PERFORMANCE BETWEEN PLANNING GROUPS FOR EACH ECONOMIC CRITERION: LOW OPEN FIRMS

	F-Value			
Economic Criterion	Group 1-2	Group 1-3	Group 1-4	Group 1-5
Revenue	1.74	1.33	1.11	2.98
Net Revenue	1.17	1.49	1.56	1.34
Earnings/Revenue(1)	1.32	1.06	2.35	1.01
Earnings/Revenue(2)	1.06	2.04	1.02	1.19
Earnings/Capital(1)	1.10	1.51	1.30	1.36
Earnings/Capital(2)	2.50	1.15	12.89	3.56
Earnings/Equity	6.35	2.17	3.57	3.58

TABLE 15

t-TEST FOR DIFFERENCE IN PERFORMANCE BETWEEN PLANNING GROUPS FOR EACH ECONOMIC CRITERION: MEDIUM OPEN FIRMS

	F-Value			
Economic Criterion	Group 1-2	Group 1-3	Group 1-4	Group 1-5
Revenue	1.25	1.36	2.53	3.46
Net Revenue	1.29	1.15	3.00	1.99
Earnings/Revenue(1)	1.73	1.01	5.36	1.75
Earnings/Revenue(2)	1.41	1.30	2.75	4.68
Earnings/Capital(1)	1.93	1.07	1.54	2.69
Earnings/Capital(2)	1.24	2.88	3.57	6.94
Earnings/Equity	1.65	2.98	7.01	2.38

TABLE 16

t-TEST FOR DIFFERENCE IN PERFORMANCE BETWEEN PLANNING GROUPS FOR EACH ECONOMIC CRITERION: HIGH OPEN FIRMS

	F-Value			
Economic Criterion	Group 1-2	Group 1-3	Group 1-4	Group 1-5
Revenue	1.9	5.58	1.91	1.26
Net Revenue	1.04	2.28	5.11	3.34
Earnings/Revenue(1)	1.55	1.27	4.17	3.74
Earnings/Revenue(2)	1.43	2.07	2.08	2.09
Earnings/Capital(1)	2.38	1.01	1.30	2.87
Earnings/Capital(2)	2.88	2.03	1.54	1.39
Earnings/Equity	1.06	2.36	369.02	3.10

is not consistent when groups 1-3 and 1-4 are included. Sometimes the 1-3 value is lower than the 1-2 value (revenue, earnings/revenue, earnings/total capital, earnings/equity) and sometimes the 1-4 value is higher than the 1-5 value (net revenue, earnings/revenue, earnings/capital). These"bumps" or inconsistencies in the pattern weaken any conclusions about greater performance as planning commitment is increased. In many cases it is just as well not to plan at all or to plan minimally.

For the medium open firms (table 15), in all seven cases, there is an improved F-Value when moving from group 1-2 to 1-5. However, once again there is often better economic performance in the other categories than in 1-5 or worse economic performance than in 1-2. Once again the pattern does not hold. Similar results appear for the high open firms (table 16). Additional analyses included trichotomizing the planning groups and the results were similar. These conclusions of the minimal or random or scattered effect of planning on economic performance are consistent with our previous findings.

A similar technique to the t-tests mentioned above is to compare two or more distributions in respect to their dispersions. Such a measure of relative dispersion is the coefficient of variation. It is calculated by dividing the standard deviation by the mean and multiplying by 100. The resulting percentage is a pure number which can be

compared. The hypothesis to be tested is that as planning becomes more sophisticated (as we move from planning group one to five), there should be more stability reflected in the variation (the V-value should be lower). In other words, the variation in economic performance for planners will be across a narrower range than that for non-planners. (See table 17.)

The results of this analysis too were mixed. When planning is dichotomized, lower V-values are found for revenue, net revenue, and earnings/total capital (2) whereas higher V-values were found for the rest. Comparison of non-planners with group five planners shows similar mixed results, lower V-values for revenue, earnings/revenue (1) and earnings/ total capital (2) and higher values for the others. In addition, similar to the t-tests the intermediate values for planning groups two, three and four are both higher and lower than those for planning groups one and five. Sometimes planners have greater stability than non-planners and sometimes lesser planners have more stability than sophisticated planners.

The only clear pattern of results is in the comparison of openness categories. With one minor exception (medium open firms earnings/revenue (2)) as firms get more open, there is a greater stability in their economic performance. Or another way, the larger firms have less fluctuation in their economic performance. They may improve or decline

TABLE 17

COEFFICIENTS OF VARIATION FOR EACH ECONOMIC CRITERION AND VARIOUS PLANNING AND OPENNESS GROUPINGS
(All Values Are Percentages)

	Coefficient of Variation								
Economic Criterion	Group 1 Non-Planners N=111	All Planners N=187	Group 2 Planners N=84	Group 3 Planners N=55	Group 4 Planners N=17	Group 5 Planners N=31	Low Open Firms N=152	Medium Open Firms N=87	High Open Firms N=59
Revenue	550	471	461	524	533	385	556	472	404
Net Revenue	207	178	136	195	317	237	229	171	137
Earnings/ Revenue(1)	341	433	684	595	183	233	375	596	267
Earnings/ Revenue(2)	593	642	597	541	759	631	617	591	556
Earnings/ Capital(1)	449	537	541	1196	237	491	614	502	329
Earnings/ Capital(2)	68	58	59	53	62	61	66	61	57
Earnings/ Equity	226	340	263	664	426	244	334	251	233

from year to year but with less severity than smaller firms. These results are consistent over all seven economic criteria. Unfortunately, there is no test of significance for the variation, but in this case the relative magnitude of the V-values shows a sharp distinction between categories. This at least gives some confidence in the results.

Similar calculations were performed for the entire sample and for the sample less the extreme values in each category. In both instances the results were the same. Table 17 shows the results without the extreme values.

Findings in Relation to Hypothesis 2

Hypothesis 2 examines the economic performance of general commodity carriers versus those handling special commodities. It states that there is no difference in the economic performance of these two groups. Similar statistical analyses were performed for testing this hypothesis as with hypothesis 1: multiple regression, simple correlations and chi-square. The results follow much the same pattern.

The R^2 and F-values for the multiple regression are found in table 18. None of the F-values was significant and in the case of the general commodity carriers only three percent of the variation was explained by planning and openness taken together and with the special commodity carriers just four percent of the difference in economic performance

TABLE 18

MULTIPLE CORRELATIONS AMONG PLANNING AND OPENNESS FOR EACH ECONOMIC CRITERION BY COMMODITY

	Sample			
	General Commodity Carriers N=164 df=2/161		Special Commodity Carriers N=134 df=2/131	
Economic Criterion	R^2	F	R^2	F
Revenue	.02397	1.971	.04056	2.768
Net Revenue	.00519	0.420	.01701	1.133
Earnings/Revenue(1)	.01679	1.374	.00823	0.543
Earnings/Revenue(2)	.03116	2.588	.01537	1.022
Earnings/Capital(1)	.01952	1.603	.00781	0.516
Earnings/Capital(2)	0.2368	1.952	.00803	0.530
Earnings/Equity	.01383	1.129	.00523	0.344

could be explained by these two variables. There was really very little difference between the two groups of carriers. Therefore, planning does not assist either general or special commodity carriers in their economic performance.

Further analysis consisted of stratifying the sample into low, medium and high openness. (See table 19.) As the result of this breakdown there were scattered significant F-values, but none of them accounted for more than eighteen percent of the variance. Once again, as with the entire sample, these significant values were found in the low open category and no significant relationships were found at all in the high open group.

The Pearson correlations for commodity and economic performance also indicated a very weak relationship. (See table 20.) The strongest relationship was a negative .12. The chi-square analyses took the form of matching the commodities against the planning groups and against the openness groups. The purpose of this was to determine whether the same planning habits were held by the general and special carriers. The results showed that there was a chi-square value of 6.67 which translated to approximately a fifteen percent probability that such a result could happen by chance. Proportionately there were a few more non-planners among the special commodity carriers (41.8% vs. 33.5%). But in planning categories two through five the proportions were about the same. (See tables 21 and 22.)

TABLE 19

MULTIPLE CORRELATIONS AMONG PLANNING AND OPENNESS FOR EACH ECONOMIC CRITERION BY COMMODITY AND OPENNESS GROUP

	Openness Group											
	Low Open Firms				Medium Open Firms				High Open Firms			
	General Commodities N=84 df=2/81		Special Commodities N=68 df=2/65		General Commodities N=51 df=2/48		Special Commodities N=36 df=2/33		General Commodities N=45 df=2/42		Special Commodities N=14 df=2/11	
Economic Criterion	R^2	F	R^2	F	R^2	F	R^2	F	R^2	F	R^2	F
Revenue	.19	9.49**	.06	2.10	.04	1.10	.002	0.03	.01	0.31	.05	0.28
Net Revenue	.08	3.50*	.06	2.25	.12	3.42*	.13	2.46	.02	0.33	.09	0.55
Earnings/ Revenue(1)	.04	1.77	.60	2.07	.10	2.54	.14	2.57	.03	0.59	.14	0.92
Earnings/ Revenue(2)	.004	0.18	.02	0.62	.02	0.52	.04	0.65	.05	1.15	.01	0.07
Earnings/ Capital(1)	.05	1.96	.13	4.72*	.17	4.75*	.29	0.61	.03	0.59	.08	0.45
Earnings/ Capital(2)	.05	1.98	.02	1.26	.03	0.65	.06	1.06	.07	1.50	.13	0.79
Earnings/ Equity	.03	1.44	.04	1.22	.04	1.03	.24	5.24*	.02	0.49	.04	0.21

*$p < 0.05$
**$P < 0.01$

TABLE 20

PEARSON CORRELATION COEFFICIENTS BETWEEN ECONOMIC PERFORMANCE AND COMMODITY HANDLED

Economic Criterion	r
Revenue	.11
Net Revenue	.07
Earnings/Revenue(1)	.06
Earnings/Revenue(2)	-.12
Earnings/Capital(1)	.08
Earnings/Capital(2)	.002
Earnings/Equity	-.01

TABLE 21

CHI-SQUARE CONTINGENCY TABLE: FIVE PLANNING GROUPS VS. TWO COMMODITY GROUPS

	Planning Group					
Commodity Group	1	2	3	4	5	Total
General	55	53	26	12	18	164
Special	56	31	29	5	13	134
Total	111	84	55	17	31	298

NOTE: df=4

Chi-square=6.67082, p=0.1543, accept Ho

TABLE 22

CHI-SQUARE CONTINGENCY TABLE: THREE OPENNESS GROUPS VS. TWO COMMODITY GROUPS

	Openness Group			
Commodity Group	Low	Medium	High	Total
General	68	51	45	164
Special	84	36	14	134
Total	152	87	59	298

NOTE: df=2

Chi-square=17.71799, reject Ho at 0.0001 level

The conclusions about commodity types parallel those drawn about the entire sample. Where there is any variation in results between firms, size is the significant factor. But even the influence of size is not overpowering.

Findings in Relation to Hypothesis 3

A second variation on the major sample is that of geographic influence. Geographic divisions are not easy to establish. The ICC has nine geographic regions. But these only reflect where the carrier's home office is and not the extent of his operation in that region. For this analysis, each general commodity carrier was analyzed according to his Trinc's territory and these territories logically combined to obtain five groups. Similar analyses were again performed and similar results achieved.

The multiple regression yielded only scattered significant F-values (see table 23), and once again these explain or predict little of economic performance. The simple r's are also very weak. (See table 24.)

Chi-square contingencies were performed on the entire sample to see if geography caused a variation in planning practices. First an overall five by five contingency was calculated (see table 25) and then each geographic region was compared against each other region. In all cases the null hypothesis was accepted, that there was no signigicant difference in planning commitment from geographic region to region.

TABLE 23

MULTIPLE CORRELATIONS AMONG PLANNING AND OPENNESS FOR EACH ECONOMIC CRITERION BY GEOGRAPHIC AREA

Economic Criterion	Geographic Area									
	East N=38 df=2/35		South N=26 df=2/23		Central N=53 df=2/50		Transcon-tinental N=8 df=2/5		West N=39 df=2/36	
	R^2	F	R^2	F	R^2	F	R^2	F	R^2	F
Revenue	.21	4.60*	.04	0.52	.11	3.12	.14	0.39	.05	0.97
Net Revenue	.02	0.25	.13	1.75	.13	3.47*	.23	0.72	.08	1.49
Earnings/ Revenue(1)	.01	0.19	.21	3.09	.08	2.27	.19	0.58	.07	1.34
Earnings/ Revenue(2)	.14	2.73	.04	0.43	.02	0.46	.03	0.08	.09	1.82
Earnings/ Capital(1)	.09	1.71	.18	2.55	.12	3.40*	.20	0.61	.05	0.92
Earnings/ Capital(2)	.20	4.50*	.03	0.31	.003	0.08	.03	0.06	.08	1.57
Earnings/ Equity	.10	2.01	.08	0.98	.06	1.59	.11	0.30	.002	0.12

*$p < 0.05$

TABLE 24

PEARSON CORRELATION COEFFICIENTS BETWEEN ECONOMIC PERFORMANCE AND GEOGRAPHIC AREA

Economic Criterion	r
Revenue	.06
Net Revenue	.09
Earnings/Revenue(1)	.02
Earnings/Revenue(2)	.04
Earnings/Capital(1)	.01
Earnings/Capital(2)	.10
Earnings/Equity	-.03

TABLE 25

CHI-SQUARE CONTINGENCY TABLE: FIVE PLANNING GROUPS
FIVE GEOGRAPHIC AREAS

	Planning Group					
Geographic Area	1	2	3	4	5	Total
Transcontinental	4	0	3	0	1	8
South	7	7	5	3	4	26
East	10	12	9	3	4	38
West	15	12	4	3	5	39
Central	19	22	5	3	4	53
Total	55	53	26	12	18	164

NOTE: df=16

Chi-square=14.96844, p=0.5270, accept Ho

Further chi-square contingencies were calculated to examine openness in relation to geography. (See table 26.) There was some significant difference here in that there seemed to be a preponderance of smaller carriers in the Eastern and Central regions.

Findings Relative to Hypothesis 4

Hypothesis 4 concerns itself with the long term effect of planning. It addresses the question of whether firms which plan improve their economic performance more as they "settle into" their plans. The hypothesis tested is that there is no difference in economic performance between planners and non-planners when compared over time.

To make this analysis, the seven economic indicators were re-calculated for the entire sample on the basis of two periods: 1965-1969 and 1970-1974. The difference between these two periods was then determined and chi-square analyses performed to test the hypothesis. In all cases the hypothesis was accepted. That is, even after years of experience planners fare no better than non-planners. In other words the improvement or decline from period one to period two was essentially the same for the planners and non-planners. A firm was just as likely to succeed more if it were a non-planner than if it were a planner. These results are consistent with the results from the tests of the other hypotheses. Planning does not seem to make a significant difference to the economic performance of the motor carrier.

TABLE 26

CHI-SQUARE CONTINGENCY TABLE: THREE OPENNESS GROUPS VS. FIVE GEOGRAPHIC AREAS

	Openness Group			
Geographic Area	Low	Medium	High	Total
Transcontinental	2	1	5	8
South	7	7	12	26
East	21	11	5	38
West	13	17	9	39
Central	25	15	13	53
Total	68	51	45	164

NOTE: df=8

Chi-square=17.03046, reject Ho at .0298 level

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The Need for an Explanation

In the previous chapter the analyses showed these results. Hypothesis 1 stated a positive relationship between planning commitment, openness and economic performance. This hypothesis was rejected since the relationships found were at a rather inconsequential level. Firms which planned did have greater stability in their year-to-year performance as measured by their coefficient of variation, but of the two major variables studied, planning and openness, openness (or size) had a greater influence on economic performance.

Hypothesis 1a was also not supported. Highly open firms which did have long-range plans, performed no better economically than those highly open firms which did not plan. Medium open firms also did not vary on economic performance according to their planning commitment, resulting in the rejection of hypothesis 1b. Low open firms according to hypothesis 1c were predicted to perform similarly irrespective of their planning practices. This hypothesis was accepted with one minor exception. It seems that low open carriers which do plan can make an improvement in gross revenues.

Geographic area of operation has no bearing on performance therefore rejecting hypothesis 2. Hypothesis 3 is rejected, since stratifying the sample on a commodity dimension does not alter the results of no effect on economic performance through planning and openness. Likewise hypothesis 4 was rejected in that carriers which planned for more than ten years did not perform significantly better than those which only planned for five or more years when compared to non-planners.

The Theoretical Background

In Chapter II the necessity for long-range planning was explained using a General Systems Theory framework. Briefly the premise was that the organization was an integral part of its environment and so must be examined as a part of the whole. As an open system, the motor carrier both influenced and was influenced by the external environment. This external environment offered various uncertainties to the firm and the planning process was prescribed to be in proportion to that environmental uncertainty. Conversely, the more certain the environment, the less the need for planning and/or the less effect planning would have on corporate outcomes. If we examine the findings of this study in light of this theoretical framework, we must logically conclude that the motor freight industry as represented by Class I, ICC regulated common carriers, operates in a rather certain

environment. In such an environment long-range planning where performed does not have the ability to influence economic performance. On the other hand if the findings showed a positive relationship between planning, openness and economic performance, the conclusion would have to be that there was a breakdown in regulation and a lessening of the influence of organized labor and other factors, thereby making the environment less certain and increasing the need for planning.

However, since long-range planning is not effective for the motor carrier it is important to examine the reasons why.

Limits to Strategic Alternatives

If the external environment for the motor carrier has fewer uncertainties than those of other firms, in other industries, then the motor carrier has fewer strategic alternatives to choose from. If he is limited in his strategic alternatives, then he does not need a sophisticated planning function to guide his decision making. If he has a sophisticated planning function it may not be necessary. In other words, although there are many forces that influence a motor carrier, they may be outside his control and therefore unable to be planned for effectively on a long-term basis. Some of these forces are discussed here.

One constraint on long-range decision making is

regulation by the Interstate Commerce Commission. The specific effects of the Motor Carrier Act of 1935 which brought truck transportation under the jurisdiction of the ICC are reflected in three areas: rights to serve specific territories for specified commodities, rates charged for service rendered and the finances of the regulated carriers (Kruger, 1975, p. 6). The implication here is that three major areas of strategic planning are not sufficiently under the carrier's control to make planning effective. Expansion of the territory served and the routes travelled can only be accomplished by presenting to the ICC well documented proof of inadequate existing service. Even the acquisition of another carrier must be justified to the ICC.

Though the carriers have a voice in rate setting, through the ten regional rate bureaus, rate increases must be justified to and approved by the ICC before they become effective (Kruger, 1975, p. 6). Additionally, without the approval of the ICC, carriers cannot issue capital stock, bonds and certain note obligations.

Note: It is appropriate to mention here that the comments about and explanations of ICC regulation are in no way intended to make a case for or against such regulation. It is the planning function which is being analyzed and not regulation. If regulation reduces the need for planning, that is a fact and not necessarily a reason to reduce regulation. The certainty provided by regulation may be a

positive force in motor carrier performance.

A second constraint on long-range planning may be the labor intensity of the industry. According to Trucking Trends (1975, p. 1) 61.5 percent of carrier revenue went for wages and fringes in 1973. This large proportion of income coupled with the strength of the Teamsters union reduces the effect that management can have on an extremely large portion of its operation, in the long run. Once again, this analysis is not a comment for or against labor rates or organized labor but a statement of fact about the industry.

The third constrainst is transportation costs. These include trucks and other equipment, fuel and road taxes. The inability to control fuel price rises as well as the inflationary effects on equipment and other costs has contributed to constraining motor carrier management in this area as well.

All of the above help to explain why the motor carrier industry has a limited capability for strategic response. There are some other lesser reasons, which may also contribute some explanation as to why long-range planning does not seem to have an effect on carrier economic performance. The first is that the industry is generally one of low profit. Table 27 shows the ranges of performance for each of the economic variables as a percentage over the ten years 1965 through 1974. In some cases extreme values have been eliminated. In almost all cases the range runs a few percent

TABLE 27

PERFORMANCE RANGES OF THE SEVEN ECONOMIC CRITERIA EXPRESSED AS A PERCENTAGE INCREASE OR DECREASE OVER THE PERIOD 1965-1974

	Performance Range	
Economic Criteria	Low Value	High Value
Revenue	-0.65	3.29
Net Revenue	-3.70	3.99
Earnings/Revenue(1)	-3.99	2.91
Earnings/Revenue(2)	-0.80	9.84
Earnings/Capital(1)	-3.69	2.55
Earnings/Capital(2)	-0.09	0.75
Earnings/Equity	-4.60	2.02

below zero and a few percent above that point. The losers do not lose too much and the profit makers do not earn very much. The largest positive percentage ranges are found in earnings/revenue (2) and these results could be a function of the way the averaging formula was constructed rather than a reflection of the earnings/revenue performance itself.

This low profit profile could be explained by the fact that rates are so closely regulated and in times of inflation there is a lag before higher rates can be instituted. For example, Kruger (1975, p. 5) reports that in 1974 there was a rate increase to cover fuel increases and one to cover the Teamster contract increases but rate relief on the whole was still not fully responsive to cost escalations on a timely basis. In other words, carriers have to bear the brunt of cost increases until they can satisfy the requirements for being granted an increase. Thus, as mentioned above, one major strategic area, that of price setting, is not fully available to the motor carrier as a strategic alternative in his planning, and this seems to account for the low profit profile of the industry to some degree. Additionally, the industry is composed of many family owned firms and many that are quite closely held. It is possible that the objectives of such firms do not include the maximizing of the economic performance variables we have chosen for this study. Though economic performance may be important to a degree, there may be other advantages accruing to the owners which

are not dependent on or which negatively affect these variables. For instance, large personal salaries, company automobiles, boats and homes are often part of the owner's remuneration.

Another strategic area which seems less fertile for the motor carrier than for other forms of business is that of research and development (R&D). The R&D function, in the sense that it is found in other industries, does not exist in the motor freight industry. There is little that can be done in the area of product development since in effect there is no product except service. There are of course, some attempts at developing materials handling equipment and more functional facilities. And innovative use of computers and commications devices represent an area of current effort. However, such actions are not likely to make dramatic impacts on the firm'slong-term position in the way a new wonder drug would for a pharmaceutical house. For the most part instead of R&D, the industry has been concerned with lobbying-type efforts such as those to increase payloads through influencing individual states to increase their maximum gross weight allowances (Trucking Trends, 1975, p. 30).

The conclusion is that the motor carrier industry is a rather static one. It does not change much from year to year, either in its financial performance (see table 28) or in its managerial approaches. This study itself has shown a consistency of planning performance going back ten

TABLE 28

FINANCIAL RATIOS FOR THE MOTOR FREIGHT INDUSTRY
(1965-1973)

Financial Ratio	Year								
	1965	1966	1967	1968	1969	1970	1971	1972	1973
Current Assets to Current Liabilities	1.23	1.16	1.17	1.11	1.10	1.08	1.14	1.16	1.16
Worth to Debt	.78	.76	.81	.81	.77	.76	.88	.99	.95
Worth to Net Debt	2.31	2.00	2.25	2.32	1.98	1.97	2.72	3.33	2.92
Revenue to Worth	5.16	5.11	4.77	4.98	5.04	4.96	4.84	4.75	4.93
Profit to Worth	.16	.14	.08	.12	.09	.06	.17	.15	.13
Profit to Revenue	.031	.027	.017	.023	.018	.013	.034	.032	.027
Number of Carriers	1,159	1,217	1,152	1,067	1,037	1,120	1,135	1,193	1,144

SOURCE: American Trucking Associations, Inc., American Trucking Trends (Washington, D.C.: American Trucking Associations, Inc., 1975), p. 27.

or more years. It is very much dependent on the state of the economy (Kruger, 1975, p. 4) and the cooperation of the regulatory agencies (both state and federal) and the Teamsters union (both national and local). Under circumstances such as these, planning opportunities are very limited and the effect will also be limited.

These conclusions are consistent with the observations of Murray (1976, p. 10) in regard to the electric power industry which has many parallels to the motor freight industry in terms of regulation. He sees management of regulated industries as having to "negotiate within a context of 'irrational' regulations, institutions . . . or at least an environment characterized by . . . inconsistency." He concludes that "Strategic options can be and often are preempted" (1976, p. 10).

Fulmer and Rue (p. 33) had some similar findings in the part of their 1973 study which dealt with service-type industries. Service industries for them included, besides transportation, communications, wholesale and retail trade, finance, insurance, and real estate. Motor freight, if included under transportation, was not listed as a separate category. Their findings seem to show a trend toward non-planners being more profitable than planners. Although there were some methodological problems with the study (Hofer, 1976, p. 263) it does give an additional indication that service industries are perhaps different from other industries in their long-range planning requirements.

The Nature of Motor Carrier Planning

Another aspect of the explanation of the ineffectiveness of long-range planning in the motor freight industry may be explained by the nature of the planning function as it is practiced in motor freight firms. The large number of non-planners and the preponderance of informal planners among those who do plan indicates a certain lack of sophisitication in the planning process. This characterization of planning and the conclusions about the limits to strategic alternatives are supported by the comments of many of the carriers on the questionnaires they returned. Some are excerpted here.

Excerpt 1: "Long range planning is limited to route extensions and market penetration planning."

Excerpt 2: "There is always a desire by top management to find ways to increase revenue and profitability by acquisition of new companies, expanding the capabilities of the present operation and by opening new terminals."

Excerpt 3: "Long range planning is designed to adapt to the drastic long range changes occurring in our industry. Greatly increased competitive conditions call for changes in the basic operations of the company, which may take years to bring about. Examples: acquiring additional operating authorities, changes from owner operation to

company operations, financial planning for terminals and equipment as needed over the next ten years."

Excerpt 4: "Frankly in an organization that has been doing the same type work for nearly fifty years the only question, if you have proper controls, is your own pricing policy and your expansion policy. Formal plans would have been a waste of time in 1975--we are victims of our economic environment far more than we are controllers of our destiny."

Excerpt 5: "Our principle plans are toward improving our operating ratio by developing return movements in line with our authority, maintaining an adequate rate structure, working with safety people to hold insurance costs down and keeping a tight hold on equipment repair and maintenance costs. Projections are necessarily based on the activity in the industries we serve."

Excerpt 6: "Most plans over one year ahead are a waste of time except for terminals and equipment purchase."

Excerpt 7: "Our plans can be changed drastically by the Commission's decision on one sub-number. Therefore, it is difficult, if not impossible, for our company to do sophisticated long range planning."

Excerpt 8: "What good is planning when dealing with such a powerful union as the Teamsters?"

Excerpt 9: "Most of the time we fly by the seat of our pants."

The concensus seems to be that planning is limited and that the influence of the ICC is strong, that of the Teamsters formidable and that the areas worth planning for are expansion, terminal operations and market penetration. Over all, there seems to be only mild enthusiasm for planning at all. Perhaps motor carriers are following the advice of Steiner (1974, p. 15) in his discussion of how to improve long range planning. Steiner insists that management make sure the system (of planning) fits the unique characteristics of the company and that firms should avoid over planning. The uniqueness of each company (and of the industry) should be taken into consideration. Companies differ on many dimensions and the planning must be tailored to fit these variables, not the other way around.

Carrier Feedback to the Conclusions Presented

A unique opportunity was presented to this author to review the findings of this study with a group of sixty motor carrier people attending a management conference. Their conclusions paralleled those suggested. When asked for explanations for the findings, the responses included: the effects of regulation, the influence of the national

economy, the nature of the industry (or major customers) served, and the strength of the Teamsters union, all mentioned above. In response to a specific question an overwhelming majority (51) felt that any significant de-regulation by the government would force a carrier to have to perform much more long-range planning. Only a small number (5) felt no change in planning practices would be required from such an occurrence. The balance (4) had no opinion.

In addition, the participants also suggested poor implementation of plans, the low quality of planning, being inflexible to needed changes in plans and placing emphasis in the wrong areas, as reasons why planning results may not be what was expected. All of these are consistent with the conclusions of this study and suggest some fruitful areas for future research.

Recommendations for Future Research

This study used a somewhat traditional approach to answering the question of the effectiveness of the long-range planning function. It was similar to but more comprehensive than other studies of this type. Now perhaps some different approaches should be used to further study planning in general and the motor freight industry in particular.

One approach would be to examine successful and non-successful carriers for differences on other than the planning dimension. We know from this study that there is little

difference in long-range planning committment. Perhaps as Steiner (1974, p. 13) and Fulmer and Rue (1973, p. 41) suggest, planning is only one of the elements of the "managerial process" and only one indication of managerial performance. It may well be that it is inappropriate to examine planning practices alone. Perhaps some composite index of managerial performance including, planning, organizing, motivating and controlling should be developed and this matched against economic variables. This index might even include any particular industry-related managerial qualities that are important to success in this industry.

A second approach might be to look at the kinds of plans. This is a two-sided approach. Plans can be examined as to their contents and their time frame. Once again dichotomizing carriers into successful and unsuccessful, the areas in which the successful carriers planned and the method of planning in those areas could be examined. This could be compared with what was or was not done by the unsuccessful carriers.

The time dimension offers another opportunity for study. In this research there is an inconsistency between the present-time view of General Systems theory and the future orientation of the planning function. This time bias may be overcome through examining the more current functions in the organization. Because of the nature of the environment for the motor carrier, short-range or tactical planning may

be of greater importance than long-range planning. It would be through tactical planning that situations like high labor intensity and rising transportation costs would be met. Programs for driver and dock productivity and improved industrial engineering techniques of the type suggested by Wyckoff (1972, pp. 154-7) would be responses to tactical planning situations. Perhaps it is the success of the short-range planning, irrespective of the kind of long-range planning which makes the difference. Many of the more successful carriers (APA Transport, Roadway) have reputations for rather successful short-range approaches (driver pick-up and delivery routing, driver and dock productivity, line-haul dispatching, etc.) as well as for their long-range plans. The question is which makes the most significant contribution or does success depend on some specific combination of short- and long-range plans?

Other areas of interest which are integral to the above are the examination of the quality of the plans, the accuracy of their forecasts and how they are produced and monitored. What are the true objectives of the firm and are these objectives being met? Perhaps it is improper to measure all firms against a standard set of objectives. The firm might be asked what its objectives are and be measured against that criteria. Managerial opinions as to their satisfaction with their firm's performance should be included as well as their opinions as to the contribution of planning to that record.

Lastly, if we concede the impact of ICC regulation and Teamster union influence on the planning process in the motor carrier, more research should be done in this area. The possible changes in regulation and possible future demands of the union should be analyzed with a view to how the carrier should prepare to meet these situations. If more planning is needed as the environment becomes more uncertain what specifically should carriers do as specific environmental changes take place. This research would be almost a comprehensive external environmental analysis to define the exact degree of the present limits to strategic decision making in motor carriers and what would be required as those limits change in very specific ways.

Concluding Remarks

General System Theory has been shown to be a way of thinking, a point of view, a perspective. Through this perspective, organizations are seen as existing as part of a larger system. They are seen as being dependent on the influence of the larger system and also influencing the larger system. The more that an organization is influenced or impacted by the larger system or environment the more open it is termed to be. Being open however, poses problems for the firm, and it has been shown that within the firm itself certain subsystems were developed to cope with these problems. One such subsystem is the managerial subsystem which includes

the decision making function in the organization. This decision making function is further subdivided to include a specific subsystem for dealing with environmental influence. Such a subsystem is characterized by the long-range planning function.

The environmental influence which causes the long-range planning function to exist varies in intensity. The greater the environmental influences the more extensive the planning function has to be to adapt to them. Conversely, a firm less open to external influences would need a planning function only proportional to that lesser influence. In the extreme, if a firm could be closed to all environmental influences then no strategic or long-range planning function at all would be required.

Long-range planning in the motor freight industry has been shown to be less valuable than originally thought. The reason for this is that the industry in a theoretical sense is really quite closed to environmental influences and consequently management has very small degrees of freedom in the area of strategic decision making. In such a situation the best of plans will not be able to alter or perhaps even predict future outcomes. Those carriers which are economically successful are perhaps performing well because of management attributes which go beyond just the planning function. In addition, as Fulmer and Rue (1973, p. 41) indicate "Still unaccounted for are the very real variables of luck, timing,

and other unpredictable natural phenomena." In addition, there seems to be strong intuitive feeling that short-range planning wields a greater influence on motor carrier performance due to the nature of the environment in which carriers operate.

For the motor carrier who does not use long-range planning we can say that perhaps he should examine very closely whether he should institute such a program. For the carrier who is planning and doing well, perhaps similar results can be achieved with less cost and effort in the planning area. For the successful non-planners we urge no move toward formalized planning.

This study was limited to long-range planning in one segment of the motor freight industry. The time dimension of plans and the various kinds of plans as well as the nature of the outside influences such as the Interstate Commerce Commission and the Teamsters union may well influence the variables under study. Future research in this area should be conducted to uncover the effects of these factors on planning.

Control Number _____

PLANNING QUESTIONNAIRE

NATIONAL SURVEY OF MOTOR CARRIER PLANNING PRACTICES

(Return To: Motor Carrier Planning Survey c/o Ernest A. Kallman 456 Heights Road Ridgewood, N.J. 07450).

I. Listed below are representative descriptions of long-range planning as might exist in a motor carrier. Check the one that most closely seems to fit the kind of long-range planning performed by your company. If none of the categories apply, briefly describe your long-range planning on the reverse side.

_____A. Goals for more than one year ahead are **formally** determined on a **company-wide basis.** A written strategy is developed resulting in specific action programs, projects, and procedures for achievement of these goals.

_____B. Goals for more than one year ahead are **formally** determined but **only for one or more areas separately,** such as sales, terminal operations, linehaul, etc. A written strategy is developed but the resulting action programs are not necessarily integrated or coordinated.

_____C. Goals for more than one year ahead are **informally** determined on a **company-wide basis.** The action program may be written and is informally monitored.

_____D. Goals for more than one year ahead are **informally** determined **only to handle particular situations,** such as an acquisition, new terminal, etc. The action program may be written and is informally monitored.

_____E. All planning activities, if any, are short-range and cover one year or less.

II. In what year was the planning approach indicated in question I. first used? _____
(If prior to 1965 enter 1965.)

III. Please answer the following questions by circling the most appropriate response in terms of your firm's activities. Please answer **every** question. The five possible responses for each question representing decreasing frequency of occurrence are:

A = always, **O** = often, **P** = periodically, **S** = seldom, **N** = never

In terms of your firm's future activities with what frequency are the following performed by your company...

1.	Long-range plans (for more than one year ahead) are prepared	A	O	P	S	N
2.	Key executives participate in the planning process	A	O	P	S	N
3.	A staff or planning department assists top management in long-range planning	A	O	P	S	N
4.	Goals are formally established for more than one year ahead	A	O	P	S	N
5.	Goals are set for the total corporation, not just for each function	A	O	P	S	N
6.	Plans are based on written policies	A	O	P	S	N
7.	Strengths and weaknesses of the firm are systematically analyzed and influence the plans developed	A	O	P	S	N
8.	Economic, political and social factors are analyzed and forecasted as input to the planning process	A	O	P	S	N
9.	Alternate courses of action for each goal are thoroughly evaluated	A	O	P	S	N
10.	Specific action programs are prepared and tied into short-range plans and budgets	A	O	P	S	N
11.	Plans are kept in written form	A	O	P	S	N
12.	Plans are distributed to those responsible for their implementation	A	O	P	S	N
13.	Contingency or alternate plans are prepared to allow for changes	A	O	P	S	N
14.	A formal control system is established to audit long-range plans	A	O	P	S	N
15.	Plans are formally reviewed and appropriate revisions made	A	O	P	S	N

PLEASE TURN TO OTHER SIDE!

IV. Does your firm have an active board of directors? YES ____ NO ____
If yes, how many directors are also company employees ____ not company employees ____?
Of the non-employees, how many are lawyers ____ commercial bankers ____ accountants ____
investment bankers ____?
With respect to director's fees, check the one which is true of your firm:
no fees paid ____ pay less than $50 per session ____ $50-$100 ____ $101-$200 ____
$201-$300 ____ $301-$500 ____ more than $500 ____.
Does the board actively participate in the planning process? Formally ____ Informally ____ Not at all ____

If the planning activities at your company do not correspond to any of the descriptions in Part I of this questionnaire, briefly describe here the kind of planning that is performed. (This space may also be used for any other comments you may wish to add.)

_____

_____

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_____

_____

Title of person completing questionnaire (optional)

Thank you for your time and cooperation!

(Return To: Motor Carrier Planning Survey c/o Ernest A. Kallman 456 Heights Road Ridgewood, N.J. 07450).

APPENDIX B

INTERVIEW GUIDELINES

(After Pre-test Questionnaire Completion)

1. What areas do your plans cover?
   (Revenue/expense/ROI/profit/operating ratio/equipment/
   acquisition)

2. Who initiates these plans?
   Who (titles) participates in the planning process?

3. What "technical" support is available?
   Do you use economic forecasts?
   What other outside factors are considered?
   What "inside" factors are considered?

4. What steps do you go thorugh from the recognition of
   the need to the actual plan?

5. How specific do your plans become? (ask to see them)

6. Who follows up on plans?
   How is this done?

7. Any other comments on planning at your company.

8. Ask appropriate questions about board of directors
   depending on responses to 1 through 7 above.

Questions re questionnaire per se:

1. Were there any questions which were confusing?

2. Were there any questions which you could not answer?

3. Were there any questions, the answer to which you could
   not get with a minimum of effort?

4. Did the questionnaire appear to have a purpose? Was it
   logical? Did any element seem unimportant?

5. Would you be more inclined to return such a questionnaire
   if a stamped envelope were included?

AMERICAN
TRUCKING
ASSOCIATIONS, INC.
1616 P Street, N.W., Washington, D. C. 20036

TECHNICAL SERVICES
DIVISION
Richard H. Hinchcliff
Managing Director
(202) 797-5220

APPENDIX C

April 12, 1976

Dear Mr. President:

On behalf of its members, ATA seeks to maintain good relations with the academic community and encourages research which is of value to the motor carrier industry. Your response to the enclosed questionnaire on Long Range Planning will assist in those efforts.

Ernest Kallman, a doctoral candidate in Management Planning Systems and a frequent participant in ATA Management Systems Workshops and other motor carrier educational programs, is investigating the value, if any, of the Long Range Planning process and its effects on profits. In other words, are carriers who formally prepare a long range plan more profitable than those who do not? Management "experts" are always urging us to make plans but no one has ever discovered whether they really do contribute to profitability. We feel this is a worthy study whose results can have practical value for motor carrier management, and we urge you to fill out and return the questionnaire.

This is NOT an appraisal of companies nor an evaluation of management effectiveness, but simply an attempt to find out what planning is done and what emphasis it is given in the organization. As you will see, the data requested in the questionnaire is not at all sensitive to your competitive position, but of course all responses will be treated as confidential and no company names will be published.

The questionnaire has been kept as short as possible. Won't you please take five minutes to fill it out now and return it in the stamped envelope provided? Thank you. The sooner your response is received, the sooner the results can be made available to you and to the motor carrier industry through ATA.

Sincerely,

Richard H. Hinchcliff

APPENDIX D

TRADE PAPER ARTICLE

TRANSPORT TOPICS

National Newspaper of the Motor Freight Carriers

No. 2123 | Published weekly at 1616 P St. NW, 20036 Second Class Postage paid at Washington, DC | WASHINGTON, DC, APRIL 19, 1976

Study Seeks Link Of Motor Carrier Planning to Profits

A study to determine what effect planning has on profitability in the motor carrier industry is being launched this month with the distribution of questionnaires to all Class I motor carriers.

The study project is being jointly carried out by American Trucking Associations and Ernest Kallman, a doctoral candidate in management planning systems at Baruch College of the City University of New York.

Richard Hinchcliff, managing director of the ATA Technical Services Division, said ATA was encouraging this research because of its potential value to the motor carrier industry. Results will be made available to all carriers upon completion of the project, he said.

Questionnaires will seek to determine the extent of long-range plan-

(Continued on page 26)

Study Seeks Link

(Continued from page 1)

ning practices and what emphasis planning is given in each organization. In the final report, no company names will be used, and no confidential information is sought in completing the questionnaires.

Mr. Kallman emphasized that the study is not an appraisal of companies or of management performance.

Expenses of the report are being borne by Mr. Kallman. He said the motor freight industry was chosen for this study because of its great homogeneity, since the same basic functions are found in the very smallest through the very largest.

Mr. Kallman marketed computer hardware to transportation firms for seven years and later became president of a company offering computerized services to the motor carrier industry. For the last six years he has been a consultant and teacher of management and computer science at Baruch College.

He is a frequent guest speaker at ATA Management Systems Committee workshops and meetings.

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APPENDIX E

May 12, 1976

Dear Mr. President:

In early April, we sent you a letter asking you to take a few minutes to complete a questionnaire about your firm's long-range planning practices. To date we have not received your reply. To make this study as comprehensive as possible, we need your response. Won't you please take five minutes now to fill it out?

Enclosed are a copy of the questionnaire as well as a stamped envelope for your convenience. Thank you.

Sincerely,

Richard H. Hinchcliff

RHH/moj

Enclosure(s)

APPENDIX F

TALLY SHEET

COMPANY NAME _____ CONTROL NUMBER _____ DATE RECEIVED _____

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
NET WORTH										
DEBT DUE WITHIN 1 YEAR										
DEBT DUE AFTER 1 YEAR										
GROSS REVENUES										
NET REVENUES										
NET INCOME AFTER TAXES										
% OF NET REVENUES										

COMMODITY _____

TERRITORY _____

PLANNING CATEGORY (Ques. I) _____

YEAR COMMENCED PLANNING (Ques. II) _____

PLANNING (raw) SCORE (Ques. III) _____

APPENDIX G

OPENNESS SCATTER DIAGRAMS

DIAGRAM 1: REVENUE, TERRITORY

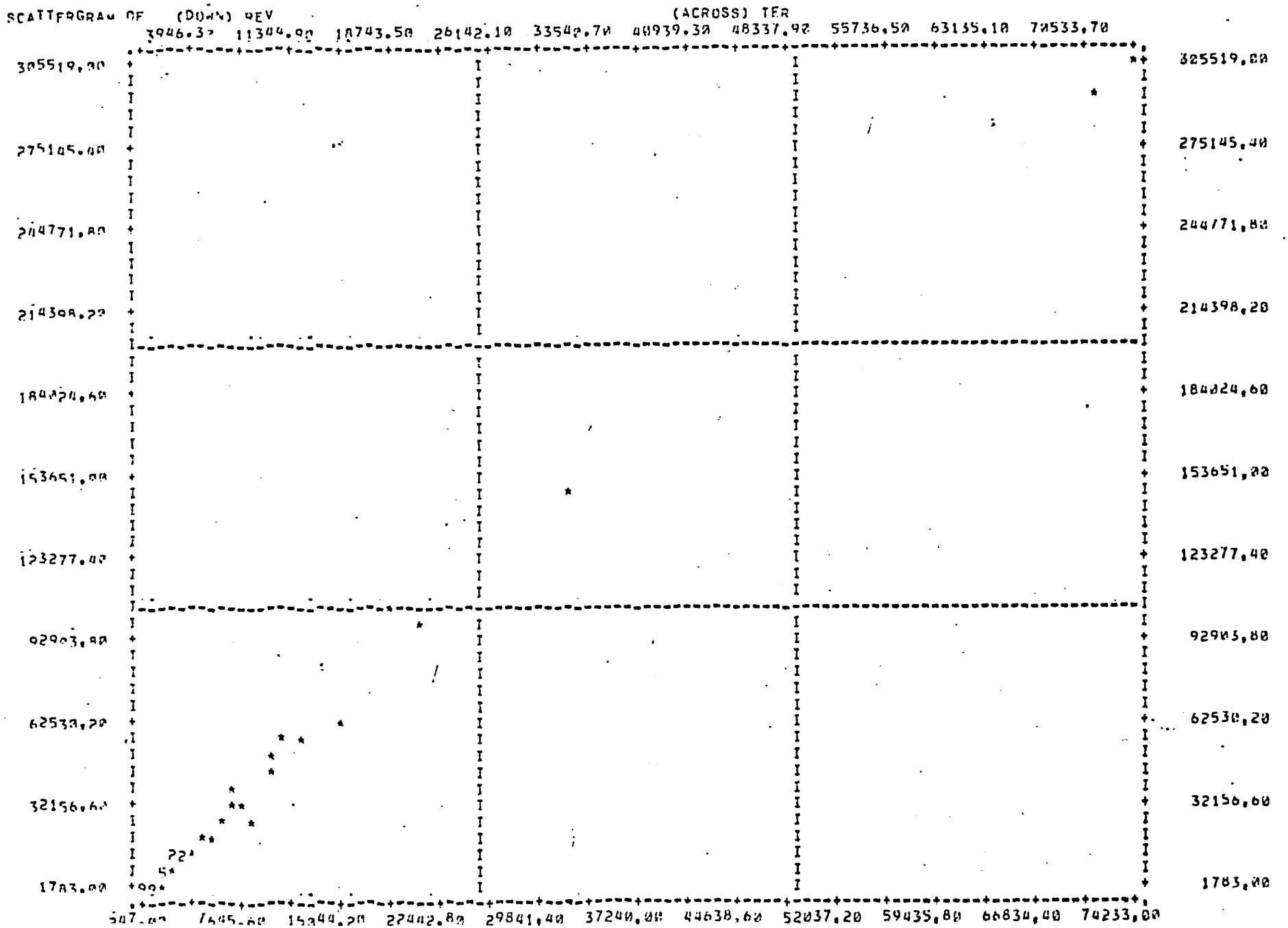


DIAGRAM 2: REVENUE, TAX

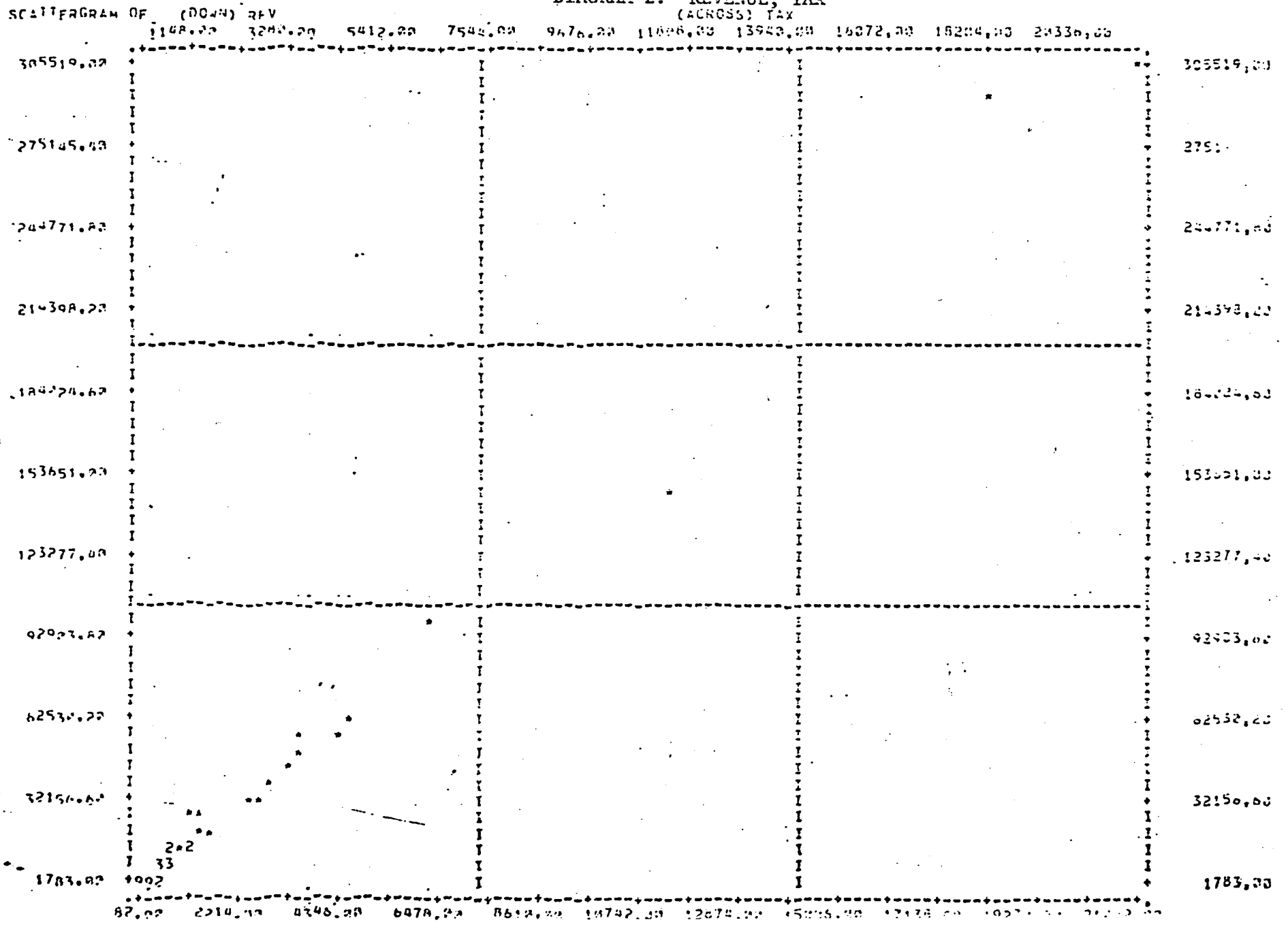


DIAGRAM 3: REVENUE, MILES

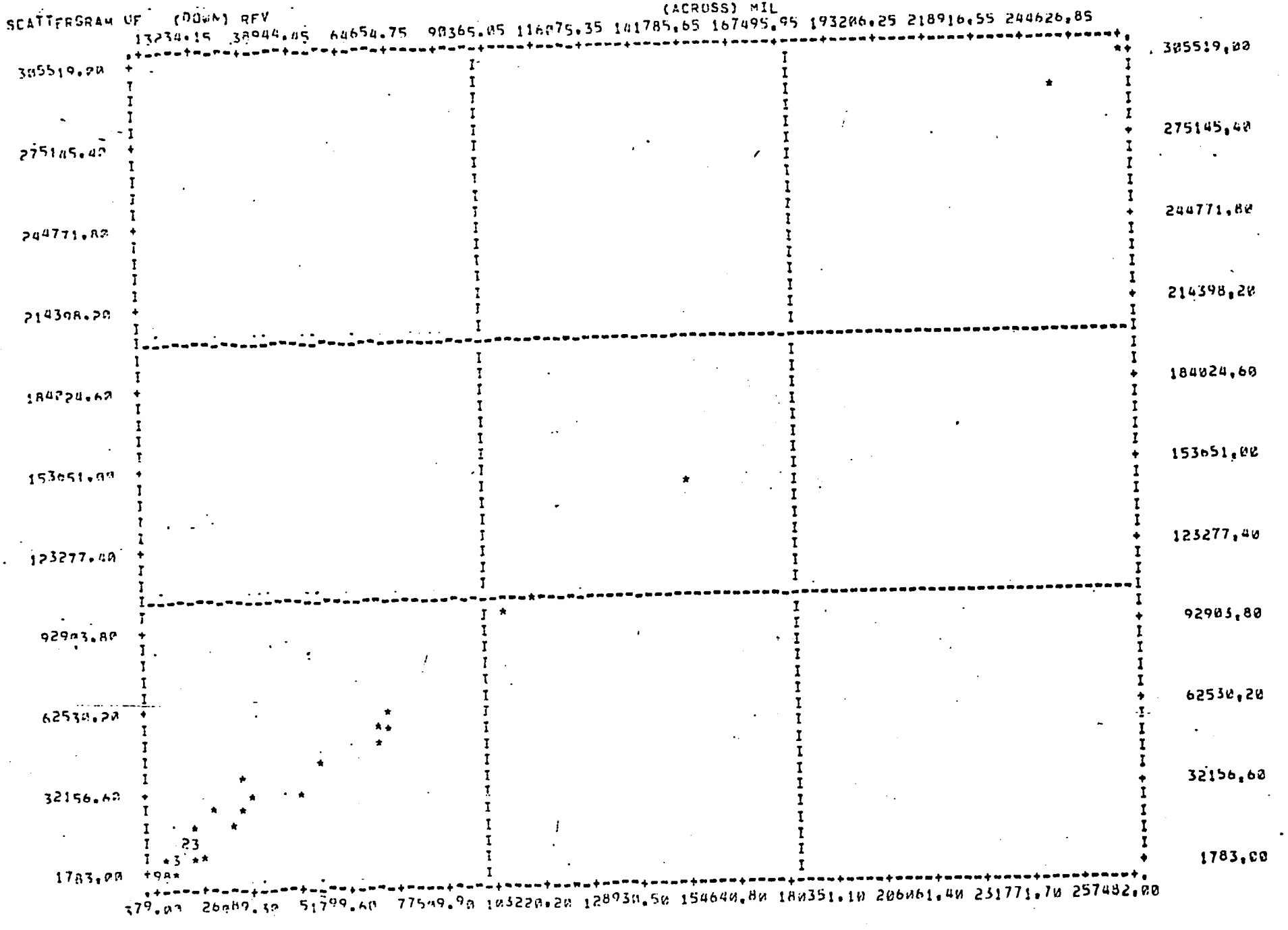


DIAGRAM 4: REVENUE, SHIPMENTS

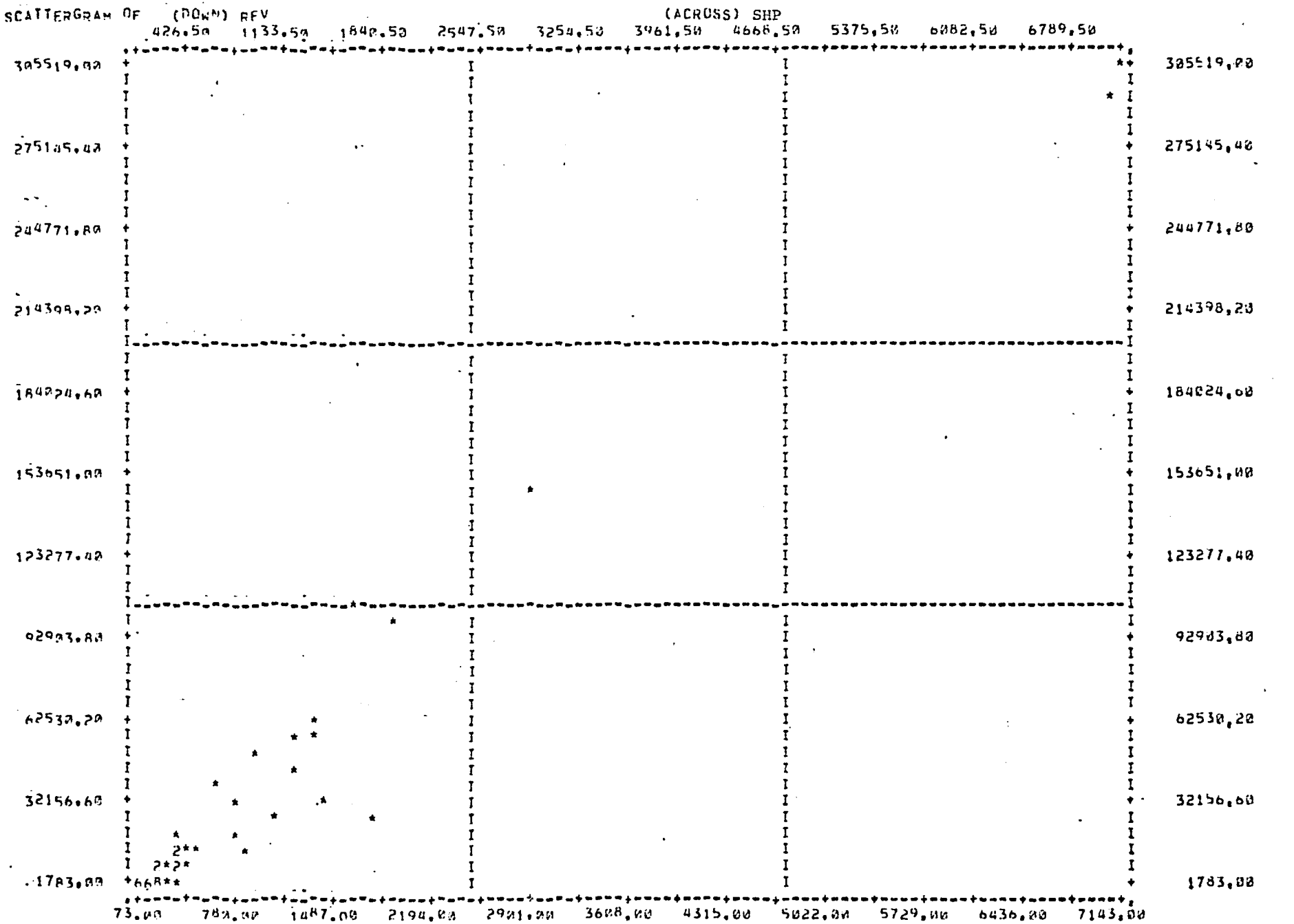
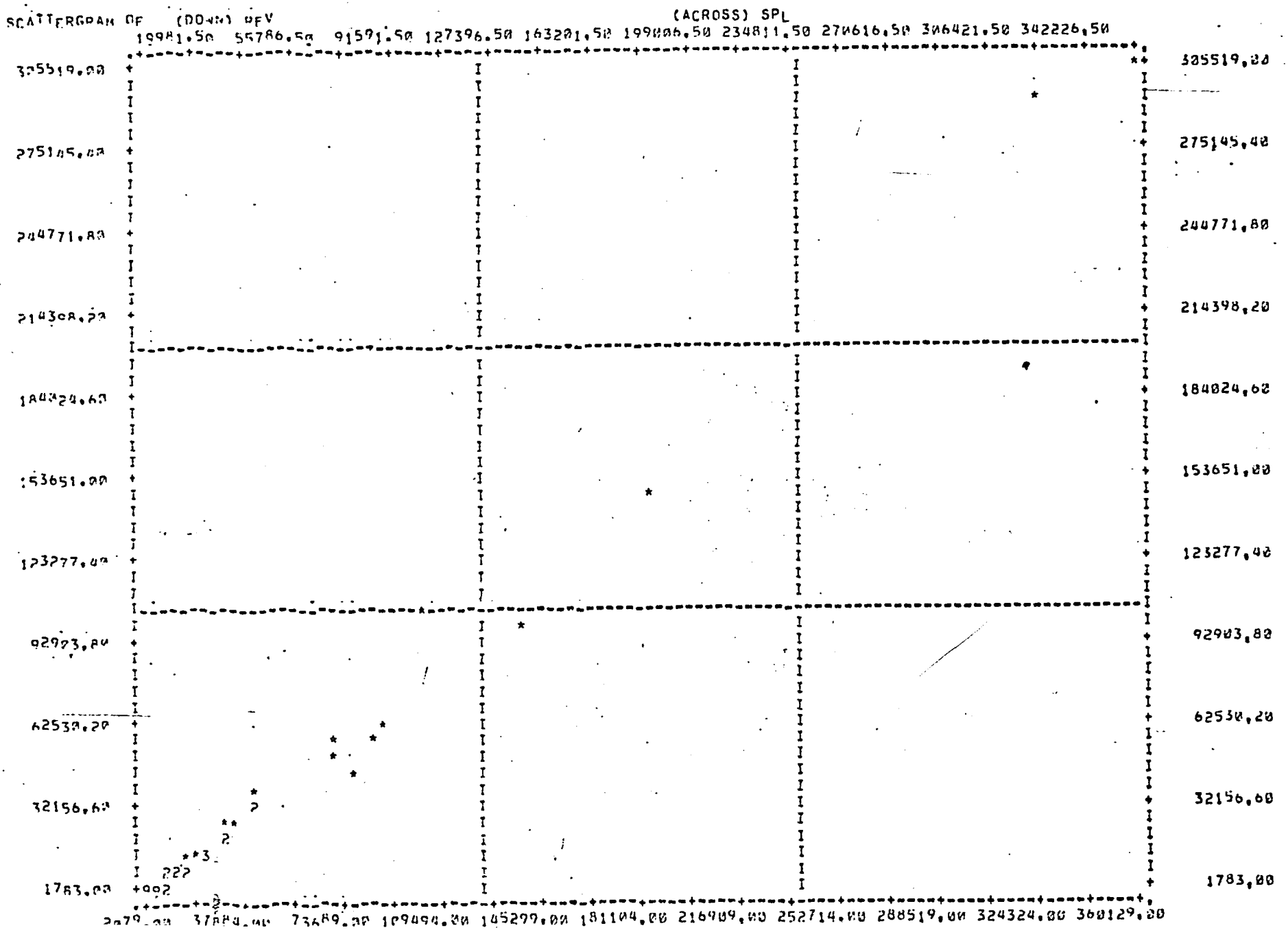


DIAGRAM 5: REVENUE, SUPPLIER COSTS



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