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The wholesaling function in the NIAD functional economic area

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THE WHOLESALING FUNCTION IN THE NIAD FUNCTIONAL ECONOMIC AREA

by

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I. INTRODUCTION

Rapid changes are taking place which affect the wholesaling function in a functional economic area of an agricultural region. Technological progress has stimulated farm consolidation, leading to larger farms and to a reduction in farm numbers and in farm population. The migration of population from rural to urban areas is causing a growth of established large cities and a growth of country towns into cities in some areas. Retailing firms are adjusting to the population shifts by moving with the population. Wholesale trade is also shifting from the smaller towns of declining population to places of population growth, such as the central cities of functional economic areas, to service their growing number of retailers. These secondary wholesale-retail centers are capturing an increasing portion of the wholesale trade in their respective areas and are competing with the well-established wholesalers in the primary wholesale-retail centers.

The functional economic area considered in this study is the NIAD area in North Central Iowa. NIAD is the abbreviated name for North Iowa Area Development. This is a voluntary association of representatives from a multi-county area organized for social and economic development purposes. NIAD includes all of seven counties - Winnebago, Worth, Mitchell, Hancock, Cerro Gordo, Floyd, and Franklin - and the northeast portion of Wright County and the northwest portion of Butler

County. The area contains 59 towns and had a population of 151,000 people in 1960, which was an increase of 1,047 or 0.6 % since 1950. The number of commercial farms in 1959 was 11,589, a ten-year decrease of 15.3 %. The total area employment in 1960 was 55,237, a decrease of 1,585 or -2.8 %. The number of persons employed in agriculture in 1960 was 15,926, a decrease of 4,388 or -21.6 % since 1950. The central city of the NIAD area is Mason City, which had a 1960 population of 30,642, an increase of 2,662 or 9.5 % since 1950 (9).

The Business and Industry Committee of NIAD is attempting to increase the number of employment opportunities in the nine county area and has requested assistance from Iowa State University. The study of the wholesaling function is included in the NIAD Business Study, which is one phase of an inventory of the available input resources and the potential profitability of private investment in selected industries in NIAD. The objective of the NIAD Business Study is to provide estimates of the market potential of the major types of wholesale and retail businesses in NIAD and estimates of the shares of the current wholesale and retail industries located in NIAD. Further knowledge of the wholesaling function will reduce uncertainty and aid wholesalers in making decisions about the trading area. This can contribute to greater efficiency and profit.

II. REVIEW OF THE LITERATURE

Wholesaling is deeply rooted in the past. It was largely associated with caravans in its earliest form, and has persisted through the ages as an integral and essential part of trade and commerce (4).

Wholesaling was discussed by several of the classical economists. Adam Smith divided economic activity into four sets in his discussion of the different employment of capitals. They were first, the improvement or cultivation of lands, mines, or fisheries; second, master manufacturers; third, wholesale merchants; and fourth, retailers (29). Jean-Baptiste Say divided industry into three branches - agricultural, manufacturing, and commercial (28). J. R. McCulloch wrote of the division of the mercantile class into two leading classes, the wholesale dealers and the retail dealers (24).

Modern economists and other social scientists neglected the study of wholesaling until after the mid-1920's. Beckman and Engle give several reasons for this neglect which has left a conspicuous lack of literature in the field of wholesaling, compared with retailing (4). Research has been hampered in wholesaling much more than in retailing due to the secrecy long maintained by wholesale organizations relative to their methods of doing business. Second, there is a strange lack of curiosity about the subject in the public at large and particularly among scholars and market investigators. Three general

misconceptions provide the basis for apathy: first, that wholesaling refers only to the operations of wholesalers; second, that the wholesaler is rapidly becoming obsolete; and third, that wholesaling differs in no important way from retailing. Finally, the nature of wholesaling is so difficult to understand and the wholesaling structure is so complex and comprehensive that few have ventured to explore its intricacies.

There has been a renaissance of interest in wholesaling since the middle twenties with special attention focused on its importance to the proper and effective functioning of our distributive system and the economy in general. For the first time in its history, the American Economics Association held a discussion of wholesale trade in its 1927 convention program. The U.S. Bureau of the Census conducted its first Census of Distribution in 1929 and subsequent Censuses of Business have included a census of wholesaling. An entire issue of The Journal of Marketing was devoted to wholesaling in 1949 containing articles by major contributors on various wholesale functions and problems in the trade and a selected group of articles written by trade association executives on their respective industries (19).

Several studies of wholesale centers and market areas have been made. Petersen attempted to present an analysis of the Denver wholesale market, indicating not only its area but also potentialities and the elements which are basic in such an

evaluation. His technique included four steps:

1. Definition of the geographical limits of the trade territory.
2. Analysis of the total number of people living within the area and their geographical distribution.
3. Reduction of the market territory into its characteristic component parts to determine variances in sales potentialities.
4. Analysis of the transportation problem from the points of view of market accessibility and cost.

Petersen added one further step to be considered. An interview should be made to determine where and why retailers buy their stocks of goods as they do. The data, when obtained from honest replies, indicate what elements are indispensable in order that any city may be recognized as a dominating market (26).

Lewis analyzed the markets of Philadelphia wholesalers in five commodity fields to develop more precise wholesale market studies and a more complete explanation of wholesale market coverage. He secured sales figures, by customer location, from company records of selected wholesalers who had tabulated annual sales by customer or area. His market pattern characteristics were developed from dollar sales of wholesalers and from the ratios of wholesale sales to retail sales. Lewis concluded from his study that a single wholesale trading area for a city does not, in fact, exist (23).

Miller generalized that wholesale trading areas vary in size and shape depending upon the lines carried, geographical barriers, concentration of population, and other factors. He discussed sales volume, number of employees, payrolls, and number of establishments as several measures of wholesale activity in studying the changes in major wholesale centers (25).

Tousley studied the Spokane wholesale market to determine the extent of the trading area for each wholesale line, to discover basic trends in the market, and to obtain information regarding competition in the various wholesale industries. His sources of data were the Census of Business and personal interviews with more than 100 wholesalers. Noting that the territory covered by Spokane wholesalers varies from one product to another and from one firm to another in the same line, he concluded that the Spokane wholesale market consists of not one, but three rather distinct trading areas. Product lines limited to the smallest area having a 75 to 100 mile radius were the food and beverage industries and farm supplies. Product lines sold in both the small and medium-sized areas were electrical goods, construction materials, plumbing and heating equipment, automobiles, automotive parts and accessories, hardware, industrial machinery and equipment, chemicals, paints, and paper. Other product lines were sold in all three areas, including dry goods and apparel, amusement and sporting goods, jewelry, and general line drugs. Tousley noted two major factors which determined the various trading areas. First was transportation

cost in relation to the value of the product. The second was the presence or absence of competition from local wholesalers in the smaller communities of the area. The product lines sold in the smaller than average territory had relatively high transportation costs relative to the value of the product and substantial competition from local wholesalers. Very large trading areas were observed for those product lines having relatively low transportation cost and very little competition from local firms. The product lines sold in the average sized territory vary in relative importance of transportation costs to the value of the product handled and in the amount of local competition. Non-economic factors included the extent to which Spokane firms were units or branches of organizations which also maintained branches in other cities and the extent to which manufacturers determined territories by means of the exclusive-franchise arrangement. Tousley found new wholesalers in medium-sized fringe cities with growing population and concluded that some decentralization of the Spokane market had taken place into the fringe areas (31).

Goldstucker emphasized the emergence of secondary wholesale centers in the primary wholesale trading areas which he analyzed. The focal point of his study was Minneapolis-St. Paul and the competing primary wholesale centers of Denver, Salt Lake City, Spokane, Seattle, St. Louis, Chicago, and Milwaukee. He determined that wholesaling has become more geographically

decentralized because the sales volume of wholesalers in secondary centers within the primary trading area had increased at a greater rate than had that of wholesalers in the Twin Cities. The percentage changes in sales volume (1939-1958) of selected secondary wholesale centers adjacent to the Twin cities were: Mason City, 555 %; Des Moines, 512 %; Cedar Rapids, 306 % Dubuque, 315; Albert Lea, 400 %; compared with Twin Cities, 317 %. The percentage change for Iowa was 455 % and for Minnesota was 346 %.

Goldstucker reported that the full impact of the secondary centers could not be fully assessed because they were still evolving. Since these centers are of increasing importance in the distributive system, more information is needed about them. He discussed some limitations of Census of Business data, his source in analyzing growth of the secondary centers. Figures on sales volume in smaller communities are frequently omitted, making a comparison of changes in sales most difficult. It is almost impossible to evaluate the changes in relative importance of sales by product lines because sales volume, when reported for some of the secondary centers, is for total trade, not by products.

Some of the more important forces causing change in the wholesaling sector of the economy are identified by Revzan as: technological changes; growth of consumers' goods markets;

growth in industrial goods markets; changes in management policies; changes in market areas; and government regulation (27).

The major underlying causes of changes in the functions and structure of agricultural goods wholesale markets are:

1. The evolving technology underlying the fast frozen process, the development of dehydration processing, and the extension through chemical research the uses of such agricultural products as soybeans.
2. A shift in the areas of corn production, resulting in a sharp increase in decentralized livestock slaughtering.
3. The decentralized effects of increased use of motor truck transportation in the shipment of agricultural products.
4. New wholesale markets for the edible farm products resulting from shifts in population.
5. Changes in transportation rates and rate relationships leading to changed boundaries of wholesale market areas, and shifting long-haul movements from fresh to processed products.
6. The many factors leading to large-scale distribution of foods causing, in turn, large movements of fresh products direct from production points into warehouses rather than through wholesale markets.

7. The increased importance of government intervention into price determination and the decline of competitive pricing.

The controlling causes of change in the functions and structure in industrial goods wholesale markets include:

1. The "New Industrial Revolution" - basic inventions, accessory products inventions, technological processes, and product improvements.
2. The population explosion which, by increasing the demand for many types of consumer's goods, has a multiplier effect on the industrial goods need directly and indirectly by the agencies involved.
3. The expansion of certain defense industries during World War II and subsequent postwar defense needs.
4. The availability of capital resources.
5. Federal Government regulation in the antitrust laws area; the elimination of the basing-point price system; the fluctuating attitude towards mergers; the effects of the Robinson-Patman Act; and the continued protection of the patent laws.
6. The belief in the creation of continuous miracles of inventions and product improvements and its accentuation of the rate of product and process obsolescence.

The causes relating to the changes in the functions and structure of the manufactured consumers' goods wholesale market stem from various changes:

1. Changes in the technology of production increasing both the quantity and assortments of available goods.
2. Shifts and increases in population and increases in incomes.
3. The struggle for channel control between producers, wholesale middlemen, and retail middlemen.
4. Changes in transportation and transportation rates.
5. The effects of government regulations.
6. The experimentations of business units with new methods of operation.

III. THE ANALYTICAL FRAMEWORK

A. Definition of Wholesaling

It is the composite of wholesale transactions that gives character to the business in which a person, firm or corporation is engaged and that makes up the total of wholesaling or wholesale trade according to Beckman and Engle. They first define a wholesale transaction and then differentiate it from a retail transaction. Consideration must be given to three basic criteria in formulating a theoretically sound definition of a wholesale transaction. On the basis of the status or motive of the customer, a wholesale transaction is one in which the purchaser does not buy for his own private or personal use or that of his family and friends but is actuated by a profit or business motive in making the purchase. Based upon the quantity of goods involved in the transaction, a wholesaler would be defined as one who buys and sells in large quantities, whereas a retail store is characterized by numerous small sales. The method of operation of the concern also helps define the wholesale or retail character of the business (4).

In viewing the motive of the purchaser as the most basic criterion in defining a wholesale transaction, Beckman and Engle draw the distinction between wholesaling and retailing in the basically conceptual sense in the following terms:

"Wholesaling includes all marketing transactions in which the purchaser is actuated solely by a profit or business motive in making the purchase and, if the goods are bought from a concern operating substantially as a retail establishment and such goods are not intended for resale, the quantity is materially in excess of that which might reasonably be purchased by an ultimate consumer.

"Retailing includes all marketing transactions in which the purchaser is actuated solely by a desire to satisfy his own personal wants or those of his family or friends through the personal use of the commodity or service purchased; it also includes transactions involving the purchase of goods for industrial consumption, from a concern operating substantially as a retail establishment, in quantity not materially larger than that which might reasonably be purchased by an ultimate consumer" (4, p. 23).

Also based on the nature and motivation of the buyer as the single most important criterion, Revzan defines wholesaling, in the orthodox sense, as "that part of marketing in which goods and services move to various classes of buyers (or agents thereof) who will: 1) engage in the resale of such goods and services with profits in mind; 2) use the goods and services in order to facilitate the production of other goods to be sold with profits in mind; (or to be used by governmental agencies in the conduct of their regular and extra-ordinary functions);

or 3) use the goods and services for various institutional purposes (e.g., educational, charitable, governmental).

"All remaining sales and movement of goods and services to persons who will use these goods and services to satisfy their respective wants and desires represent retailing transactions" (27, p. 2).

The literature refers to three principal concepts of wholesaling as presented by Beckman and Engle. The theoretically soundest concept is the broad view of wholesaling which includes all activities relating to the purchase or sale of goods in a wholesale transaction, recognizing no fundamental distinction between the sale of goods by prime producers, by manufacturers or other processors, by wholesalers, or by any of the functional or non-title-taking middlemen engaged in wholesale trade. The narrow view of wholesaling confines the term to the operations of wholesalers who sell exclusively to retailers and restricts the definition of wholesalers to those wholesalers who take little to the goods they buy, and who sell them subsequently to bona-fide retailers for resale to ultimate consumers. This narrow concept, which is usually held by laymen, is highly abstract and unrealistic because very few wholesalers sell exclusively to retailers. It is of little practical or theoretical value. The middle view of wholesaling is that adopted by the Bureau of the Census. This

concept was a compromise position dictated by technical statistical considerations of census taking and reporting by geographic areas (4).

The 1963 Census of Business covered wholesale trade as defined in major group 50 of the 1957 edition of the SIC Manual and its supplement issued in 1963. The coverage included establishments primarily engaged in selling merchandise to retailers; to institutional, industrial, commercial, and to professional users; or to other wholesalers; or in negotiating as agents in buying merchandise or for selling merchandise to such persons or companies. An establishment was defined as a single physical location at which business is conducted (42). This study employs the middle concept of wholesaling used in the Census of Business.

B. Specific Objectives of the Study

The general objective of this study is to develop a procedure for determining where retailers in a given area buy their goods for resale and why they purchase from each source. Several specific objectives are outlined as contributing to the solution of the problem:

1. to analyze selected trends in the agency and geographic structures of wholesaling within the NIAD area.
2. to describe the quantities and sources of various types of goods purchased by NIAD retail firms for resale.

3. to identify certain categories of goods which may have increased sales potential to NIAD retail stores by prospective wholesaling firms locating in NIAD.

C. Hypotheses and Assumptions

Several hypotheses are tested in this study:

1. The wholesaling function performed by NIAD establishments is being concentrated among establishments which are located in Mason City.
2. The wholesaling function performed by NIAD establishments is being concentrated among merchant wholesalers.
3. The trends in volumes of goods sold by Cerro Gordo County wholesale establishments differ between categories of goods.
4. The major sources of goods purchased by NIAD retail firms vary by type of good.
5. The dollar volume of goods purchased from each of six sources varies with the total dollar volume of the good purchased by the store, the size of town where the store is located, the distance of the store from the central city, the total dollar volume of all goods purchased by the store, the dollar volume of the good sold by the store, the total dollar volume of all goods sold by the store, the type of store, and the type of good.

6. The shift in purchasing pattern differs among types of goods.
7. The potential shifts of purchases by NIAD retailers from wholesalers outside NIAD to NIAD wholesalers varies among the type of good.

These hypotheses are advanced on the basis of the assumption that NIAD will be affected by the underlying forces of change causing national trends in the wholesaling sector. It is further assumed that any change in the wholesale price index would have equal effects among agencies and among areas compared; therefore, no price adjustments will be made between years.

D. The Theoretical Framework

1. The functional economic area and central place hierarchy

An introduction to the functional economic area is found in the operational definition of the labor market area concept given by Adams and Mackesey. "A labor market area is that geographic space that has a centrally located cluster of industry or other source of employment and that forms a community in the same sense that a great majority of the people who are in the labor force maintain both their places of employment and their places of residence in the area. The outer boundaries of the area are determined primarily by two factors: 1) the relative distance (in time and cost, as well as in space) to other

centers of employment, and 2) the distance people are able and willing to commute day after day to the center of employment" (1).

A functional economic area contains virtually all the goods and services which its inhabitants obtain by face to face interaction. Fox discusses the functional economic area as a relatively self-contained social and economic area having the following residentiary features (13):

1. The number of individuals making daily trips across area boundaries from nighttime to daytime shelters is small relative to the total population.
2. The number sleeping in Area A and working in Area B is roughly equal to the number sleeping in Area B and working in Area A.
3. The number of boundary crossings of the nighttime to daytime shelter type would be noticeably increased if arbitary boundaries were drawn more than a mile or two from those which minimize the daily crossings.
4. If the basic areas are aggregated into clusters of four or five contiguous ones, the percentage of the total population sleeping within a cluster and working outside of it is only slightly larger than the percentage sleeping in an area and working outside of it.

The basic functional economic area is organized around a central city containing from 25,000 to a million or more

nighttime inhabitants. The total population of the basic area is from 100,000 persons to more than 1 million. The geographical extent of an area varies from 2,000 to 6,000 or more square miles. The size of a functional economic area is much less variable than the population of its central city as one compares areas. A first approximation of the boundary of a functional economic area is one hour's driving distance or 50 road miles (12). The boundary could be further defined by examining the relative densities of traffic flows between the smaller communities and the competing central cities (12, p. 35).

A heirarchy of central places based primarily upon the existence of specified ranges of retail and wholesale functions, supplemented by minimum requirements of dollar volumes of retail and/or wholesale trade was developed by Borchert and Adams. Fox and Kumar describe the central place hierarchies within functional economic areas in Iowa in terms of the Borchert-Adams definitions. The full convenience center is typically of 1,000 to 2,500 population and from $1,000,000 to $5,000,000 of annual retail sales. The partial shopping center has from 2,500 to 5,000 population and about $5,000,000 to $10,000,000 of retail sales. The complete shopping center normally contains 5,000 to 25,000 persons and has $10,000,000 to $40,000,000 of retail sales. The secondary wholesale-retail

centers are characterized by more than $40,000,000 of annual retail sales, more than $40,000,000 of wholesale sales, and the presence of from 10 to 13 types of specified wholesale functions. These centers range in population from 25,000 to 50,000. The primary wholesale-retail trade centers must, by the Borchert-Adams definition, have at least $75,000,000 annual volume of retail sales, at least $75,000,000 of wholesale sales, and all of 14 specified wholesale business functions. These requirements are met by most Iowa cities of 50,000 population or more (14).

The NIAD area has been identified as a functional economic area by at least three separate studies: The Arthur D. Little report to the Iowa Development Commission, the Iowa State Department of Public Instruction report in connection with House Resolution 6, 59th General Assembly, and area delineation studies by the Department of Economics and Sociology, Iowa State University (9). The accompanying map by Kumar (Figure 1) shows the home-to-work mobility in the nine-county area as indicated by the 1960 census in the unpublished series of Tables Ph-4 (14). The commuting pattern supports the delineation of NIAD as a functional economic area.

Mason City is the central city of NIAD, being the only place meeting the Borchert-Adams criteria as a secondary wholesale-retail center. NIAD contains two complete shopping centers, Charles City and Clear Lake. Forest City, Hampton,

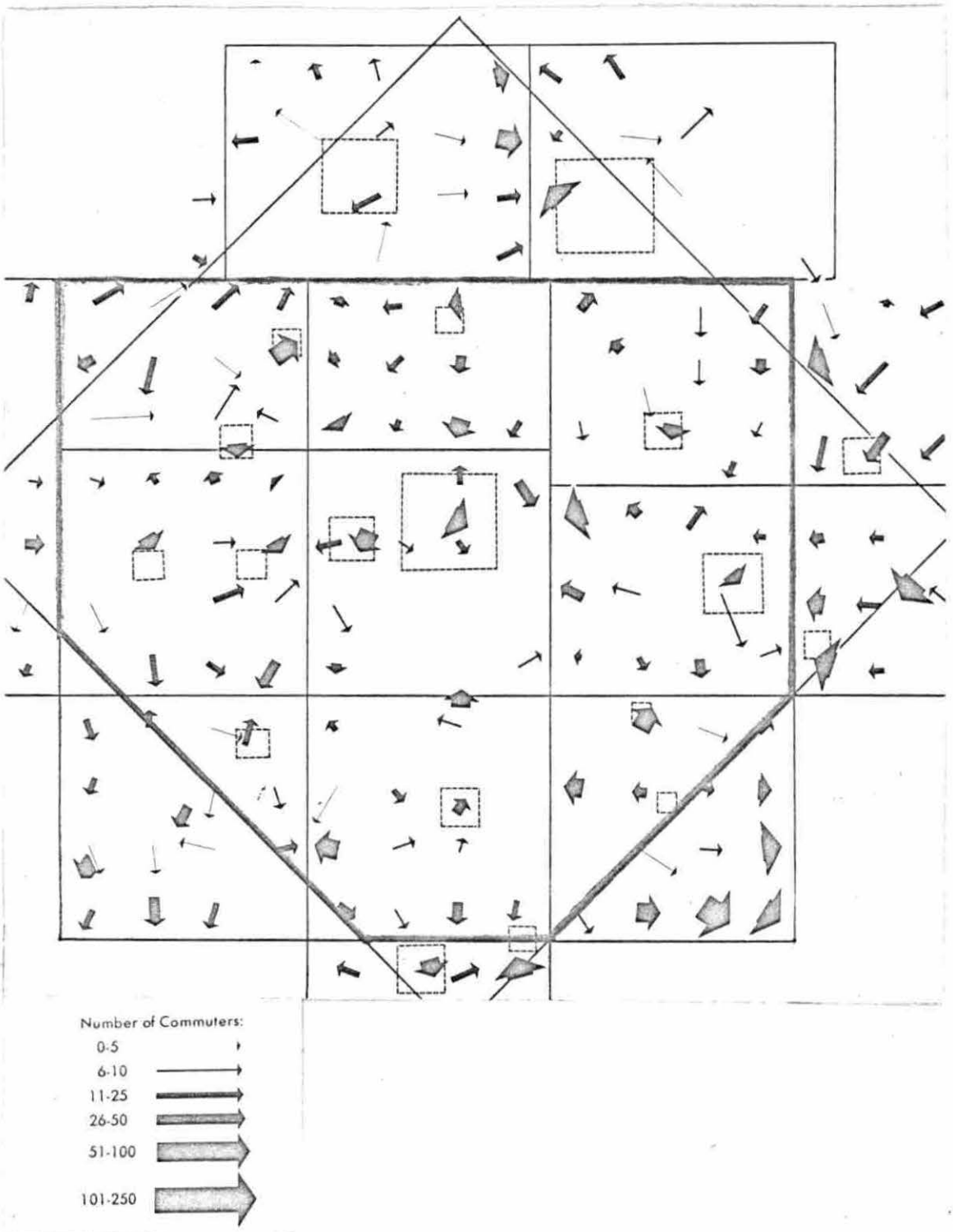


Figure 1. Commuting pattern in NIAD

and Osage are classified as partial shopping centers. Eleven communities identified as full convenience centers are Belmond, Britt, Buffalo Center, Garner, Greene, Lake Mills, Manly, Nora Springs, Northwood, Sheffield, and St. Ansgar (Figure 2). NIAD also contains eleven towns having populations of 500 to 1,000 which may be classified as minimum convenience centers. The area also includes thirthy-six hamlets of under 500 population.

2. Wholesaling in economic theory

The examination of the role of wholesaling in economic theory has been deficient in three different aspects, according to Beckman and Engle. Its relationship has been limited, for the most part, to production without relating it adequately to the distribution, exchange, or consumption phases of economic theory. The concept of wholesaling has been narrowed to a spatial one, in which all important functions of wholesaling other than that of transportation have been disregarded or subordinated (4).

The Beckman-Engle evaluation of the fundamental economic objectives of wholesaling is that in so far as the wholesale distribution structure performs essential economic functions effectively, "it contributes to a more efficient production of wealth, to a larger distribution of income, to a smoother determination of prices, and to a more complete satisfaction of consumer wants" (4, p. 104). Wholesale market activities contribute to the production of wealth through the creation of

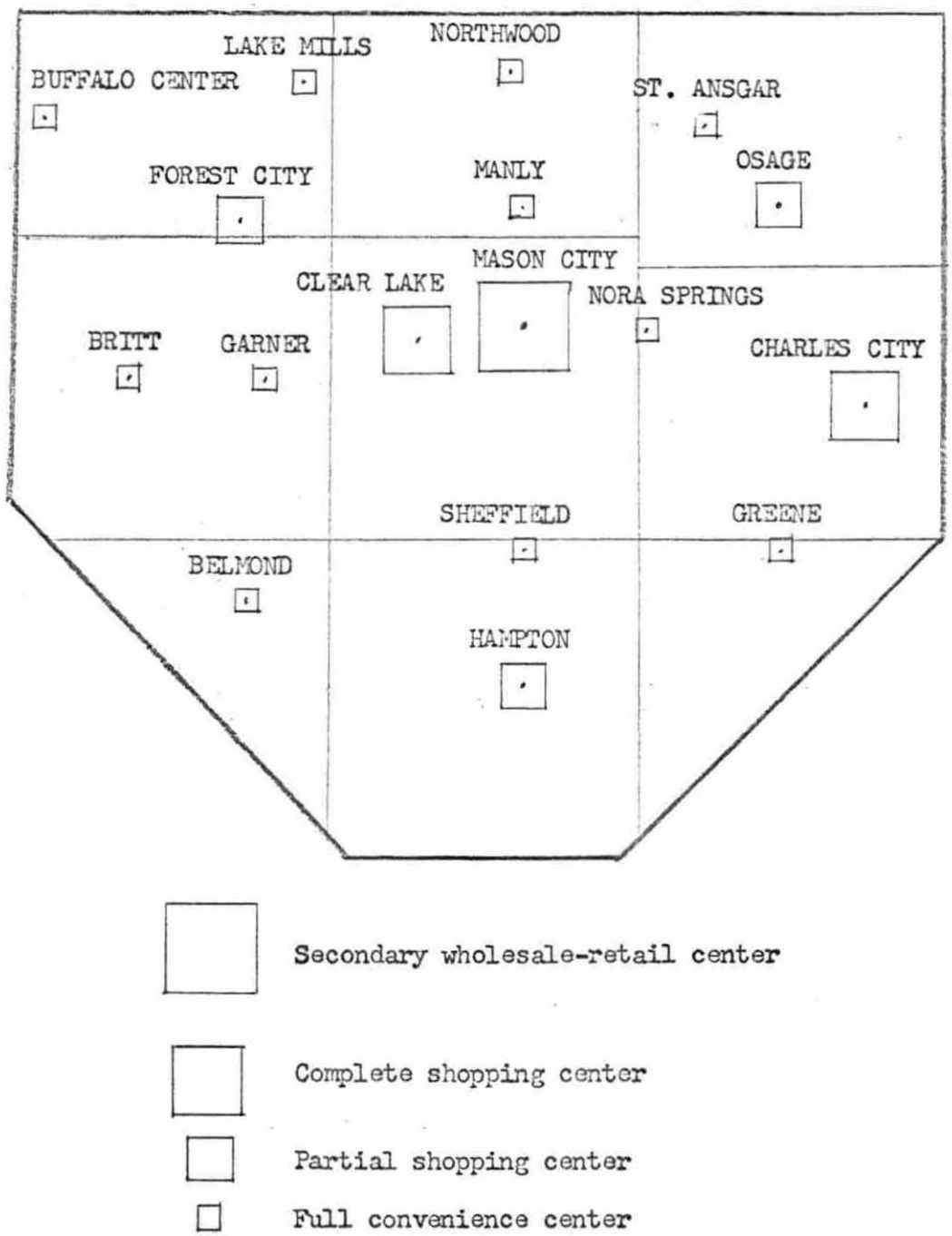


Figure 2. Distribution of central places in NIAD

time, place and ownership utilities. Wholesaling contributes to the distribution of incomes directly by paying wages, rent, and interest and by providing profits to successful owners. It helps directly to determine real incomes through the influence it exerts upon commodity prices because the forces of demand and supply trend to operate more nearly in accordance with the postulates of competitive price theory in wholesale markets than elsewhere according to Beckman and Engle (4, p. 104). Wholesaling influences the consumption of economic goods and services by interpreting the consumer's wants to the producer, and assembling, storing, and distributing the goods wanted to the retail outlets.

3. Functions and strategy of wholesaling

Beckman and Davidson define a marketing function as a major economic activity inherent in the marketing process, pervades it, and which, through a continuous division of labor, tends to become specialized (3). One of the earliest and most widely quoted classifications of marketing functions is that of Clark who grouped them under three main headings: 1) function of exchange; 2) functions of physical supply; and 3) facilitating functions (5). Several other authors have broadened the list to include more functions under the three main headings (3, 7, 27, 45):

1. Functions of exchange and contact
   A. Merchandising: the function of marketing strategy
   B. Buying and selling: the tactics of marketing
2. Functions of physical distribution
   A. Transportation
   B. Storage
3. Facilitating (auxiliary) functions
   A. Standardization and grading
   B. Financing
   C. Communication and research (marketing information)
   D. Risk.

The general strategic aspects of wholesaling in marketing stem from the following conditions, according to Revzan (27):

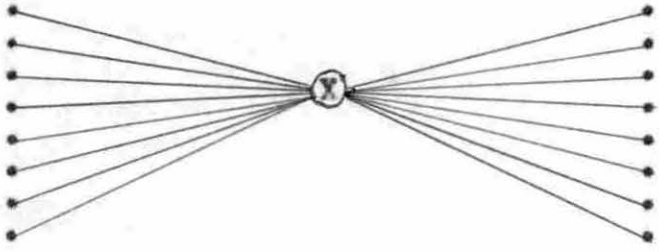
1. The development of diversified, large-scale mass production in factories located at a distance from the areas of principal use of the output thus produced.
2. An increase in the volume and proportion of such production made prior to, rather than for, the specified order of users.
3. A corresponding increase in the number of levels of intermediate-user consumption between the production of basic raw materials at the beginning of the channel and the areas of final use at the end of the channel.
4. The increasing need for adaptations of products to the needs of intermediate and final users in terms of

quantities, shapes, packages, and other elements of assortments, as well as in pricing arrangements.

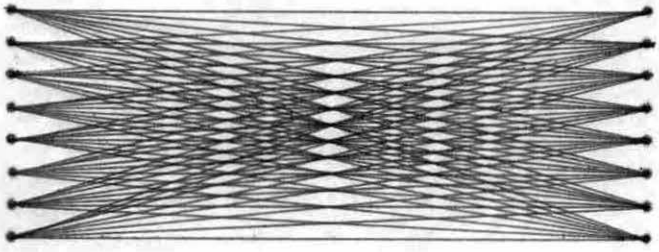
5. Continuing increases in both the quantities and varieties of goods and services in relation to the foregoing.
6. The necessity of establishing primary and intermediate markets (organized and unorganized) in which the various stages of wholesale exchange and the establishment of wholesale price levels (systematic and unsystematic) would take place.

The combined importance of wholesale middlemen and intermediate markets can be illustrated with two simple examples of eight retailers and eight manufacturers. In one case the wholesaling structure includes one wholesale middleman with intermediate markets and in the other case the wholesaling structure is without intermediate markets and wholesale middleman.

8 Retailers 1 Wholesaler 8 Mfrs.



8 Retailers No Wholesaler 8 Mfrs.



The effect of one wholesaler in the above illustration has been to reduce the number of lines of communication from 64 to 16. One hundred thousand lines would be needed for direct transactions between 1,000 retailers and 100 manufacturers, but with one distributor as the middleman, only 1,000 lines would connect 1,000 retailers with 100 manufacturers.

Beckman and Davidson list various functions normally associated with the term "wholesaler" which are performed by regular wholesalers (3). Those functions which are services to retailers are:

1. Plan for and anticipate the requirements of the customers.
2. Assemble an assortment of numerous merchandise items from many manufacturers or other supplier.
3. Bring merchandise to customers at lower costs than would otherwise be possible, partly because of buying in large quantities.
4. Produce time and place utility by maintaining a reservoir of goods near the point of ultimate demand.
5. Provide prompt delivery service.
6. Provide financial assistance through the extension of trade credit.
7. Provide information and assistance on retail store merchandising and operating problems.

The wholesaler, under certain conditions, performs a variety of marketing functions which are services to the sources of supply, including:

1. Advise on marketing problems from the point of view of a distribution specialist.
2. Establish connections with the whole field of retail outlets.
3. Reduce the manufacturer's cost of physical distribution.
4. Reduce the capital requirements of manufacturers.
5. Simplify accounting and credit problems of manufacturers by carrying the accounts of many retailers.

4. Agency structure of wholesaling

The wholesaling structure is defined by Beckman and Engle as that complex of business establishments which are constantly functioning to move the products of industry through the channels of trade from primary and other producers to the retail outlets or to industrial customers (4). Rezvan wrote of four aspects of the structure of wholesaling: agency structure, geographical structure, channels, and price structure (27).

Agency structure describes and analyzes that part of wholesaling which consists of the pattern or design of the various business establishments whose principal concern it is to carry on the functions of wholesaling within the over-all marketing system (27).

Six major segments of the agency structure are identified by Beckman and Davidson (3). Four of these classes are distinguished according to ownership and method of operation:

1. Wholesaler merchant establishments operated by concerns that are primarily engaged in buying, taking title to, usually storing and physically handling goods in large quantities, and reselling the goods, usually in smaller quantities, to retailers or to industrial or business users.
2. Manufacturers' sales branches: establishments that are maintained by manufacturers apart from manufacturing plants and which are operated by them primarily for the marketing of their own products at wholesale. Some of these have warehousing facilities where stocks of goods are maintained, whereas others are merely sales offices. Many of them also wholesale allied and supplementary lines purchased from other manufacturers.
3. Agents and brokers: functional middlemen who do not, for all or more of their business, take title to the goods in which they deal but who negotiate sales (or purchases) for clients or principals. They are compensated in the form of commissions on sales or purchases.

4. Chain store warehouses: establishments that are operated by retail multi-unit organizations primarily for the purpose of assembling and distributing goods and performing other wholesale functions for the stores of such organizations.

Two additional classes are distinguished, not on the basis of ownership, but because of the unusual character of their physical facilities or method of operation:

5. Petroleum bulk stations: places of business engaged primarily in the storage and wholesale distribution of gasoline, oil, or other bulk petroleum products.
6. Assemblers: establishments engaged primarily in purchasing farm products or sea foods in growers' markets or producing regions. They usually purchase in relatively small quantities, concentrate large supplies, and thus assemble economical shipments for movement into major wholesale market centers.

Five type of operation classifications are listed in the 1963 Census of Business (44). They correspond closely with the above classes, combining wholesalers and chain store warehouses into a Merchant-Wholesalers group. The other four Census groupings are Manufacturers' Sales Branches, Sales Offices; Petroleum Bulk Stations, Terminals, LP Gas Facilities; Merchandise Agents, Brokers; and Assemblers of Farm Products.

5. Area structure of wholesaling and location of wholesaling establishments

Area structure is referred by Revzan to the extent to which there are to be found systematic patterns of relationships between the various components of the wholesaling sector and the pertinent spatial units (27). One level of structure arises from the spatial gaps between where supplies of basic raw materials can be made commercially accessible and the locational patterns of the using manufacturing industries and related businesses and the geographical layout of the transportation system bridging these gaps. A second level of structure arises from the patterning of spatial arrangements between wholesale middlemen, retailing agencies, and ultimate consumers. Economic units become structured and oriented in their locational patterns on where raw materials are found; on market-oriented locations; on intermediate locational bases found strategically between producers and markets; on "footloose" or geographic amenities bases; or on multiple-location orientation-pattern bases.

Various types of theory are available for analyzing the area structure of wholesaling. Revzan discusses the economic theory of the location of manufacturers, the economic theory of the law of market area, and measures of regional trade balances as being particularly applicable (27). The early work devoted to the economic theory of location was dominated

by the Germans, with Weber providing the first framework of a general location theory (46). Hoover attempted to establish a theoretical framework for analyzing locational preferences and patterns, locational change and adjustments, the locational significance of political boundaries, and the relationships of locational theory and public policy in the first of several important contributions by American scholars. Greenhut examined location theory, analyzed the most important factors influencing plant location, appraised some empirical studies, and advanced a general theory of plant location (17). Isard generalized and extended the theory including a mathematical formulation (21).

The first of two important contributions to a framework of economic theory and the law of market areas was a formulation by Fetter (11). Fetter's law establishes the relationships that market territories may vary inversely either with increases of base prices or of freight rates relative to those of their geographical competitors. Hysons' restatement of Fetter's law is as follows: "The boundary line between the territories tributary to two geographically competing markets for like goods is a hypercircle. At each point on this curve the difference between freight costs from the two markets is just equal to the difference between the market prices, whereas on either side of this line the freight differences and the price differences are unequal. The ratio of the freight rates

from the two markets, determine the location of the boundary line; the higher the relative price and the lower the freight rate, the larger the tributary area (20, p. 324).

Isard's approach is an application of input-output analysis to the determination of regional commodity flows and net balances (22).

Duddy and Revzan interpreted several factors as the determinants of the boundaries of organized wholesale market areas (7):

1. Product weight relative to value
2. Relative perishability
3. Product differentiation techniques
4. Factors affecting plant location
5. Prices and price policies
6. Transportation rates and services
7. Individual firm's marketing methods
8. Auxiliary services.

The determination of trading area boundaries with the existence of unorganized markets becomes much more an individual management decision and less a group decision (27).

Beckman and Engle consider four fundamental decisions that must be solved by firms considering the wholesaling field as: 1) choosing a line of business; 2) decision as to the extent of the line of merchandise to be carried; 3) selection of the trade territory or market area to be covered; and 4) choice of a location for the wholesale house. Certain criteria

affect the choice of a community for a distributing center that are of general application regardless of the kind of business or the territory. Among the most important of these outlined by Beckman and Engle are population, income, transportation facilities, competitive conditions, labor conditions, the financial situation, tax burdens, and inducements offered by the community (4).

6. Linkages and blockages in the channel

The channel of distribution is defined by Beckman and Davidson as the course taken in the transfer of title to a product in its passage from its first owner to the last owner (3).

Linkages are defined by Revzan as the formal and informal connections between the middlemen themselves, and between the middlemen and other business enterprises. Linkages may be based on negotiating transactions involved in buying and selling, on communication networks other than in negotiating, or on a whole variety of facilitating agencies and their functions (27).

Blockages are discussed as the activities of one or more links (Business units) in a particular channel to protect the economic status of that channel by placing barriers (blockages) in the way of competing channels. Blockages are one of a series of formal and informal devices originated by marketing institutions to counteract or forestall anticipated changes,

except those favoring the institution using the blockage. These obstructions to the formation of competitive linkages may be made effective by exclusive dealer franchise arrangement or other legal devices preventing any links in the channel from handling any competitive products; various forms of legislation designed to restrict the units permitted to market particular products; by retail price maintenance agreements or other price control measures; by establishment of special fighting brands in the channels; by creation of special subsidiaries not identified with the parent organization; and by collusive activity within or outside the letter and the spirit of the law (27).

The formation of blockages designed to protect existing linkages, to force out competing linkages, or to curb or prevent the formation of new linkages has significant relationship to the estimation of potential shifts in the purchasing patterns of retailers in a given area.

IV. METHOD OF PROCEDURE

A. Sources of Data

1. Measures of the importance of wholesaling

Revzan lists several measures of the gross importance of wholesaling (27). Two which may be obtained from Census of Business are the ratio of total wholesale sales to total retail sales and the total dollar sales of all wholesale middlemen. The wholesale/retail sales ratio was used in the Lewis study (23). The wholesale dollar volume reported for an area should be higher than the retail dollar volume because the wholesale volume includes sales by wholesale establishments to industrial and commercial users, who buy the goods not for resale. The wholesale figure also includes duplicate counting from sales by one wholesale organization to another. Miller added that whole sales volume has been most frequently used, number of employees, payrolls, and number of establishments can be employed with equal validity (25).

No wholesale price index is used in this study because the hypotheses tested are concerned with comparisons between areas during common years. No tests of dollar volumes are made between years.

2. Census of business

Certain data were available from the 1948, 1954, 1958, and 1963 Census of Business. The following were obtained for each of the nine counties in NIAD and for Mason City: number of total establishments; total annual dollar sales in wholesale trade; total dollar sales in retail trade; number of merchant wholesaler establishments; annual dollar sales by merchant wholesalers; number of establishments of other operating types, combining manufacturers sales branches and sales offices, petroleum bulk plants, terminals, and LP gas facilities, merchandise agents and brokers; and assemblers of farm products.

Data for the remainder of NIAD were obtained by subtracting the Mason City data from the totals of the nine counties to provide a basis for area comparisons of Mason City with the rest of NIAD.

The use of census data for the area analysis of wholesaling has certain limitations due to reporting procedures. Sales volumes have been omitted in frequent cases to avoid disclosure. Sales volumes are reported by product categories for those counties having 100 establishments or more. Sales volume reports by products are not available for smaller counties.

The 1958 and 1963 Census provided data concerning total annual dollar sales and the number of establishments for each of the following major SIC categories in Cerro Gordo County,

which includes Mason City: 501. motor vehicles and automotive equipment; 502, drugs, chemicals, and allied products; 504, groceries and related products; 505, farm products and raw materials; 508, machinery, equipment, and supplies; 509, miscellaneous products; and combined totals for 503, dry goods and apparel; 506, electrical goods, and 507, hardware, plumbing, and heating equipment and supplies.

3. NIAD business survey

The NIAD Business Survey was conducted to obtain more detailed information not available from secondary sources such as the Census of Business.

Information obtained through the survey included the types of goods purchased for resale by NIAD retailers, the annual dollar purchase of each good purchased for resale from each of six sources, the major reason for the source of purchase, the percentage purchasing pattern of each good from each source five years ago, and the reason for the change in purchasing pattern, if any. The need for this information was emphasized in the Petersen study (26).

A structured personal-interview survey was taken of the managers of the stores selected in the sample of NIAD retail firms. The sample consisted of 328 of the 3273 stores reporting retail tax collections to the Iowa State Tax Commission. (Only the names of the stores, sales tax license numbers, addresses, counties, and types of stores were obtained from the tax

commission. No information regarding amounts of sales tax collections was requested nor received other than the quarterly statistical reports and annual tabulations regularly distributed by the Division of Research and Statistics.) The sample was drawn by selecting every tenth store from a stratified random ordering of all stores by type of store and by counties within types of stores.

The questionnaire was designed to provide the information needed in this survey and to furnish additional information complementary to a NIAD Labor Survey. The Business Survey questionnaire forms were tested in Mason City before the field work formally began in late August, 1964.

Two interviewers conducted 95 % of the survey interviews. The author conducted over 40 % of the interviews and trained another interviewer who collected the information from over 45 % of the sample. About 15 late questionnaires were gathered by an extension agent in NIAD.

The procedure for editing, classifying, coding, and tabulating was prepared by the author with the assistance of personnel in the Economics Computing Room and other graduate students.

The population, the original sample, and the number of completed usable questionnaires by store types are as follows:

Store type Code No.	Description	Number in population	Number in sample	Number completed	Per Cent sample
100	Food	645	65	63	9.77
200	Apparel	97	9	8	8.25
300	General merchandise	744	75	72	9.68
400	Furniture and equipment	71	7	7	9.86
500	Motor vehicle	718	72	69	9.61
600	Lumber and materials	205	20	19	9.27
700	Vending machines	8	1	1	12.50
800	Service	225	23	20	8.89
900	Contracting	2	0	1	50.00
1000	Public utilities	114	11	6	5.26
1100	Miscellaneous	444	45	44	9.90
	Total	3273	328	310	9.47 %

B. Procedure for Trend Analysis

1. Linear regression

Linear regression analysis was used to test null hypotheses supporting the two general hypotheses that the wholesaling function performed by NIAD establishments is being concentrated among establishments located in Mason City and that the wholesaling function performed by NIAD establishments is being concentrated among merchant wholesalers.

The regression model is specified by the equation $Y = \mu + \beta(X - \bar{X}) + E$, where Y is any value of the dependent variable, X is the independent variable, μ is the mean of the population corresponding to $X = 0$, β is the change in Y per unit of X, and E is a random variable drawn from $N(0, \sigma)$. The basic assumptions of this model are:

1. For each selected X there is a normal distribution of Y from which the sample Y is taken at random.
2. The means of all the sampled populations lie on a straight regression line.
3. All sampled populations are normally distributed and have a common variance.

The regression line, $Y = \mu + \beta(X - \bar{X})$ is estimated by the equation $\hat{y} = \bar{y} + b(X - \bar{X})$. Deviations from the linear model are used as the estimate of error.

The null hypothesis that there is no linear trend ($H_0 : B = 0$) may be tested since $(\frac{b - B}{s_b})$ follows the t-distribution with $n - 2$ degrees of freedom. s_b equals $s_{y.x} / \sqrt{\Sigma(X - \bar{X})^2}$. Given $H_0 : B = 0$ and $H_A : B \neq 0$, if the test statistic $b/s_b \geq t_{n-2}$, the null hypothesis should be rejected and the alternative hypothesis should be accepted that a linear trend exists ($H_A: \beta \neq 0$), subject to the probability of the t-test selected. If the test statistic $b/s_b < t_{n-2}$, the null hypothesis that there is no linear trend among the dependent variables should not be rejected.

For purposes of comparing two sets of values of the same dependent variable observed on similar independent variables for two classifications, it was necessary to test whether a significant difference exists in the two trends. The null hypothesis that there is no significant difference between two trends (H_o: $|B_1 - B_2| = 0$) may be tested since $\frac{(b_1 - b_2) - (\beta_1 - \beta_2)}{\text{s.d.}\ (b_1 - b_2)}$ also follows the t-distribution.

The s.d. $(b_1 - b_2) = \sqrt{2\ s_b^2} =$

$$\sqrt{\frac{\text{pooled sum of squares due to deviation from regression}}{\frac{n-2}{\Sigma\ (X - \bar{X})^2}}}\ .$$

Given H_o:$(b_1 - b_2) = 0$ and H_A:$(b_1 - b_2) \neq 0$, if the test statistic $|b_1 - b_2| / \sqrt{2\ s_b^2} \geq t_{2(n-1)\ \text{d.f.}}$, the null hypothesis should be rejected and the alternative hypothesis should be accepted that there is a significant difference between the two trends (H_A:$|b_1 - b_2| \neq 0$), subject to the probability of the t-test selected. If the test statistic $< t_{2(n-1)\ \text{d.f.}}$, the null hypothesis that there is no difference between trends should not be rejected.

In cases where $b_1 = 0$, $b_2 \neq 0$ or where $b_1 \neq 0$, $b_2 = 0$, the null hypothesis that $b_1 = b_2$ was rejected and the alternative hypothesis that $b_1 \neq b_2$ was accepted, supporting the existence of a difference in two trends.

2. Analysis of variance

Analysis of variance was used to test null hypotheses supporting the general hypothesis that the shift in purchasing pattern from 1959 to 1964 differs among types of goods.

The following split-plot model was used:

$$X_{ijk} = u... + A_i + \pi_{k(i)} + B_j + AB_{ij} + \pi'_{j(ik)} + E_{ijk}$$

where

$i = 1, \ldots, a$; $a = 4$ dollar volume of purchase quartiles;

$j = 1, \ldots, b$; $b = 2$ years;

$k = k, \ldots, n$; n = number of stores in each quartile group of the good analyzed; $\pi_{k(i)}$ designates the effect of plot k within level a_i; $\pi'_{j(ik)}$ designates residual subplot effects. Each of the a levels of factor A is assigned at random to na plots. Within each plot, the levels of factor B are assigned at random to the subplots. The model assumes that $\pi_{k(i)} = N(0, \sigma_\pi)$; $\pi'_{j(ik)} = N(0, \sigma_{\pi'})$; and $E_{ijk} = N(0, \sigma_E)$.

The expected values of mean squares for the split-plot ANOV with A and B values fixed, plots random are

Source of variation	Degrees of freedom	Expected values of mean square
A: volume	$a - 1$	$\sigma^2_E + a\sigma^2_\pi + nb\sigma^2_A$
error	$a(n - 1)$	$\sigma^2_E + a\sigma^2_\pi$
B: years	$b - 1$	$\sigma^2_E + \sigma^2_{\pi'} + na\sigma^2_B$
AxB: volume x years	$(a - 1)(b - 1)$	$\sigma^2_E + \sigma^2_{\pi'} + n\sigma^2_B$
error (b)	$a(n - 1)(b - 1)$	$\sigma^2_E + \sigma^2_{\pi'}$
Total	$nab - 1$	

C. Other Statistical Methods

Chi-square analysis was used to test null hypotheses supporting the general hypotheses that the major sources of goods purchased by NIAD retail firms vary by type of good and that the potential shifts of purchases by NIAD retailers from wholesalers outside of NIAD to NIAD wholesalers vary among types of goods.

Multiple regression analysis was used to test null hypotheses in support of the general hypothesis that the dollar volume of goods purchased from each of six sources varies with the total dollar volume of the good purchased by the store, the size of town where the store is located, the distance of the store from the central city, the total dollar volume of all goods purchased by the store, the dollar volume of the good sold by the store, the total dollar volume of all goods sold by the store, the type of store, and the type of good.

D. Procedure for Estimating Potential Shifts in Purchasing Pattern

Each manager interviewed was asked to indicate his major reason for purchasing from each source. These reasons were divided into two groups. One group of reasons included price; better service; quality of product; convenience; and the closest or only source available. It was assumed these managers in Group I had no blockages preventing their purchasing from any source providing the price, service, quality or

convenience desired, and that the manager could shift his purchase to a new source offering one or more of these factors, all other things being equal (27).

The other group of reasons included chain store connection; brand of product; loyalty to hometown or the particular source; direct franchise and established distributorship or trade area; and no answer. It could not be assumed that a manager in this Group II could shift his purchase to a new competitive source providing the factors discussed with Group I.

The purchases by managers in Group I from wholesalers outside the NIAD area were considered potential shifts to any NIAD wholesaler offering a lower price, better service, higher quality or more convenience, all other things being equal. These purchases were totaled and compared with present purchases from NIAD wholesalers.

E. Limitations of this Study

This study was limited to such analysis of area structure and agency structure of wholesaling in NIAD that can be accomplished with the data available in the Census of Business and provided by the NIAD Business Survey. No analysis of price structure was attempted.

Forecasting of increased purchases due to population and income changes are outside the scope of this study, nor does it present any minimum sizes of trade areas nor minimum volume of sales for any wholesale establishments.

This study does not include any analysis of the data found in the survey questionnaires concerning labor force, managers' education and experience, and retail trade areas.

V. ANALYSIS OF DATA AND RESULTS

The results obtained in the study are presented in this chapter in five sections. Section A analyzes the area and agency concentration of the wholesaling function of NIAD. Section B summarizes the shifts in volumes of Cerro Gordo County wholesale sales from 1958 to 1963. Section C lists the sources and volumes of goods purchased by retail firms in the NIAD Business Survey. Section D reviews the attempt to determine shifts in the purchasing patterns of various categories of goods. Section E presents data concerning potential shifts in purchasing patterns of retail firms in the NIAD Business Survey.

A. Area and Agency Concentration of the Wholesaling Function in NIAD

The data to analyze the concentration of the wholesaling function were obtained from the Census of Business. The measures used were the wholesale/retail sales ratio, volume of wholesale sales, and number of wholesale establishments. Figure 3 shows a comparison of these measures for the years 1948, 1954, 1958, and 1963 in the nine county area represented by NIAD, Mason City, and the remainder of NIAD.

Null hypotheses supporting the general hypothesis that the wholesaling function performed by NIAD establishments is being concentrated among establishments located in Mason City were tested by linear regression analysis. This method was discussed

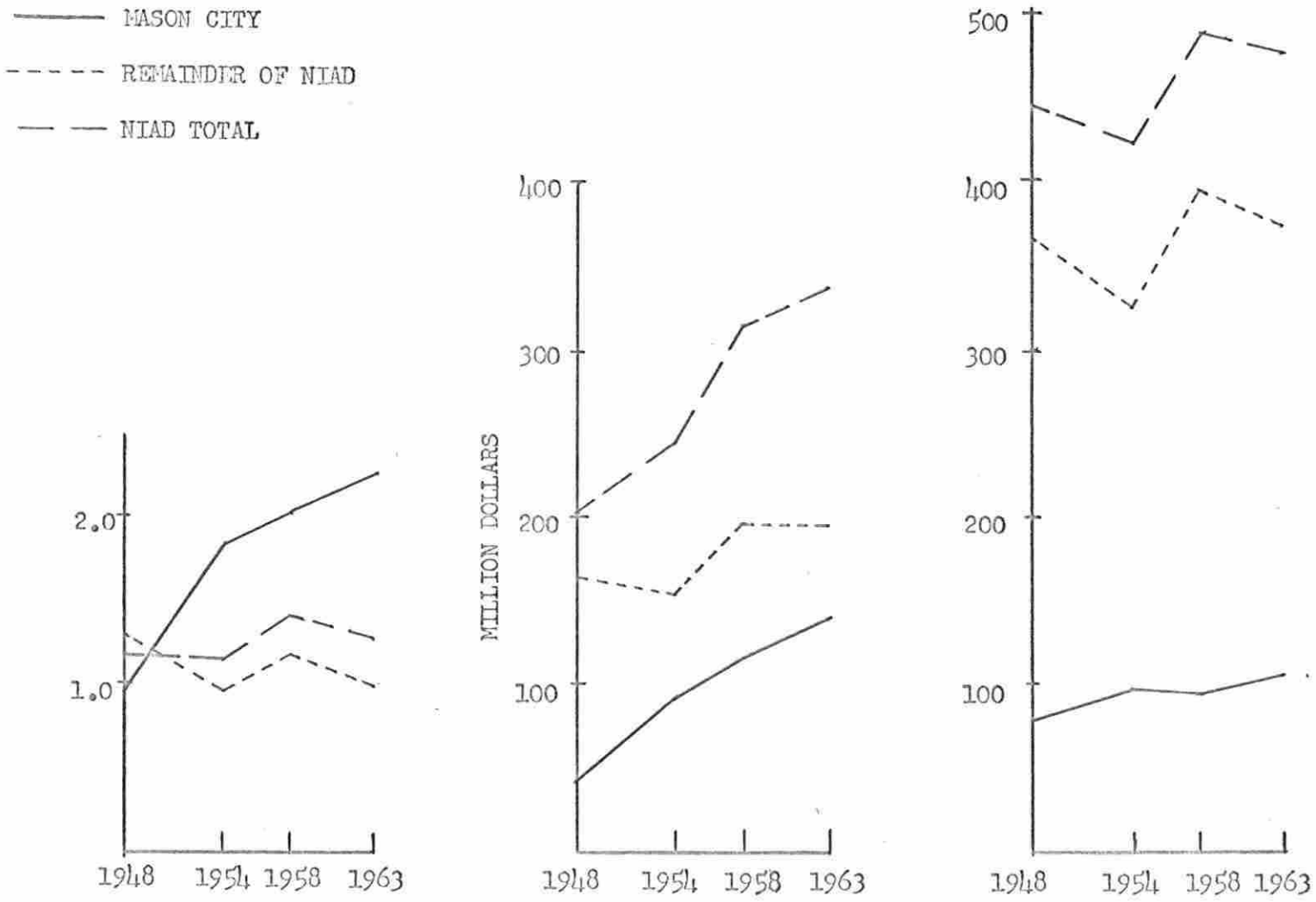


Figure 3. Area Concentration of Wholesaling in NIAD

Table 1. Wholesale/retail sales ratios of two area groups by years

Area	1948	1954	1958	1963	b-value	t-value
Mason City	.933	1.829	2.061	2.260	.092	3.83*
Remainder of NIAD	1.286	.960	1.184	.994	-.013	.081

*significant at the 0.10 level; $t > 2.92$

in detail in Section B, Chapter IV. Table 1 summarizes the wholesale/retail sales ratio in Mason City and in the remainder of NIAD. (Tables 1, 2, and 3 were prepared from basic census data presented in Table 12 in Appendix A.)

The estimated slope of the Mason City trend is 0.092. The test statistic ($t = 3.83$) > the table value of 2.92 ($t_{n-2;\alpha = .10}$). The null hypothesis b_1 equals 0 is rejected and the alternative hypothesis that the slope of the Mason City trend does not equal zero is accepted. The estimated slope of the trend for the remainder of NIAD is -.013. The null hypothesis b_2 equals zero is not rejected because the test statistic ($t = 0.081$) < 2.92.

In a comparison of the two trends the test statistic ($t = 3.535$) > 1.943 $\left[t_{2(n-1);\ \alpha = .10}\right]$ and also exceeds 2.447 $\left[t_{2(n-1);\ \alpha = .05}\right]$. The null hypothesis that b_1 equals b_2 is rejected and the alternative hypothesis that the two slopes

Table 2. Volume of wholesale sales[1] in two area groups by years

Area	1948	1954	1958	1963	b-value	t-value
Mason City	$ 42,867	$ 93,865	$118,192	$140,101	68.77	6.793**
Remainder of NIAD	$160,664	$152,852	$198,703	$198,682	33.75	2.034

[1] $1,000 units

**significant at the 0.05 level; $t > 4.303$

are not equal is accepted. The evidence measured by the wholesale/retail sales ratio supports the general hypothesis that the wholesaling function performed by NIAD establishments is being concentrated in Mason City.

Table 2 shows the volume of wholesale sales in the two areas. Estimated slope of Mason City trend is b_1. Reject $H_o : b_1 = 0$; Accept $H_A : b_1 \neq 0$. Estimates slope of trend of remainder of NIAD is b_2. Do not reject $H_o : b_2 = 0$. Trend comparison test statistic ($t = 1.80$) < 1.943. Do not reject $H_o : b_1 - b_2 = 0$.

The evidence that the slope of the trend of wholesale sales in Mason City is greater than zero and also the lack of a positive trend of wholesale sales in the remainder of NIAD support the general hypothesis that the wholesaling function performed by NIAD establishments is being concentrated in Mason City.

Table 3. Number of wholesale establishments of two areas by years

Area	1948	1954	1958	1963	b-value	t-value
Mason City	79	96	95	105	1.69	3.665*
Remainder of NIAD	366	325	394	372	1.69	0.526

*significant at the 0.10 level; $t > 2.92$

Table 3 presents the number of wholesale establishments in the two areas. Estimated slope of Mason City trend is b_1. Reject $H_0 : b_1 = 0$; Accept $H_A : b_1 \neq 0$. Estimated slope of trend in remainder of NIAD is b_2. Do not reject $H_0 : b_2 = 0$.

The null hypothesis that there is no significant difference in the trend of the number of wholesale establishments in Mason City and the remainder of NIAD area is not rejected.

Figure 4 shows volume of sales by merchant wholesalers and by other types for NIAD and the two areas. Other types include manufacturers' sales branches and sales offices; petroleum bulk stations, terminals and LP gas facilities; merchandise agents and brokers; and assemblers of farm products.

Table 4 lists the volume of wholesale sales by NIAD merchant wholesalers and by NIAD other types. (Tables 4, 5, and 6 were constructed from basic census data presented in Table 13, Appendix A.)

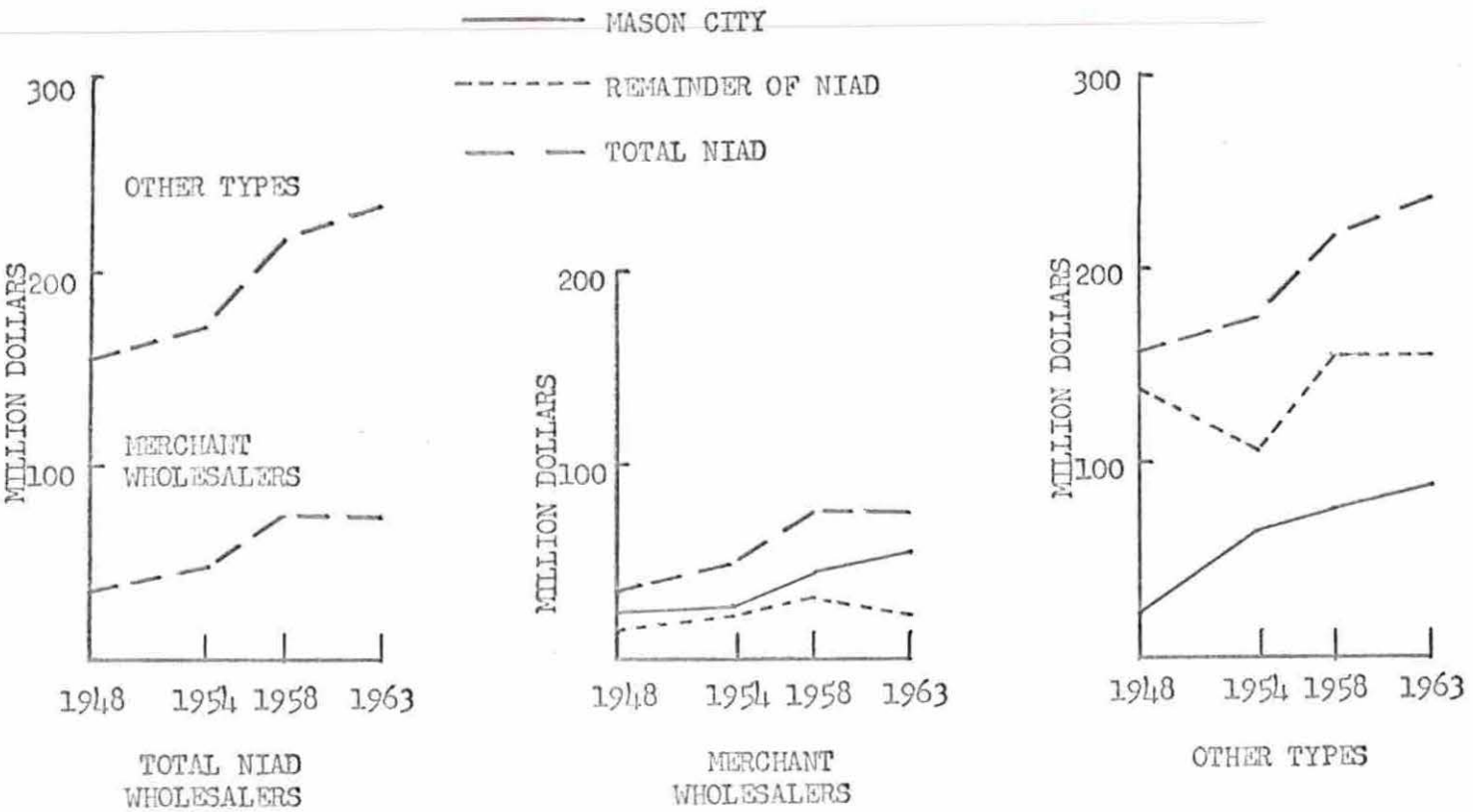


Figure 4. Agency Concentration of Wholesaling in NIAD

Table 4. Volume of wholesale sales of two agency groups by years

Agency	1948	1954	1958	1963	b-value	t-value
Merchant wholesaler	$ 36,161	$ 49,847	$ 75,435	$ 74,078	29.858	3.477*
Other types	$156,738	$171,392	$219,418	$233,763	59.971	4.945**

*significant at the 0.10 level; $t > 2.92$

**significant at the 0.05 level; $t > 4.303$

Estimated slope of merchant wholesaler trend is b_1. Reject $H_o : b_1 = 0$; Accept $H_A : b_1 \neq 0$. Estimated slope of trend of other types is b_2. Reject $H_o : b_2 = 0$; Accept $H_A : b_2 \neq 0$. Trend comparison test statistic ($t = 2.026$) > 1.943. Reject $H_o : b_1 - b_2 = 0$; Accept $H_A : b_1 - b_2 \neq 0$.

The evidence measured by the volume of wholesale sales does not support the general hypothesis that the wholesaling function performed by NIAD establishments is being concentrated among merchant wholesalers. The analysis of the trends indicate a concentration of sales volume among other types of wholesalers.

Table 5 shows the volume of merchant wholesalers' sales in the two areas.

Table 5. Volume of sales[1] by merchant wholesalers of two areas by years

Area	1948	1954	1958	1963	b-value	t-value
Mason City	$22,161	$28,717	$44,100	$52,422	22.849	7.093**
Remainder of NIAD	$14,000	$21,130	$31,335	$21,656	7.009	1.024

[1]volume in $1,000 units

**significant at the 0.05 level; $t > 4.303$

Estimated slope of Mason City trend is b_1. Reject $H_o : b_1 = 0$; Accept $H_A : b_1 \neq 0$. Estimated slope of trend of remainder of NIAD is b_2. Do not reject $H_o : b_2 = 0$. Trend comparison test statistic ($t = 2.09$) > 1.943. Reject $H_o : b_1 - b_2 = 0$; Accept $H_A : b_1 - b_2 \neq 0$.

The evidence that the slope of the Mason City trend is greater than the slope of the remainder of NIAD supports the general hypothesis that the wholesaling function performed by NIAD establishments is being concentrated among establishments which are located in Mason City.

Table 6 lists the volume of sales by other types of wholesalers in the two areas.

Table 6. Volume of sales[1] by other types in two areas and by years

Area	1948	1954	1958	1963	b-value	t-value
Mason City	$ 20,706	$ 65,148	$ 74,092	$ 87,679	45.94	3.964*
Remainder of NIAD	$136,032	$106,244	$145,326	$146,084	14.047	0.705

[1]volume in $1,000 units

*significant at the 0.10 level; $t > 2.92$

Estimated slope of Mason City trend is b_1. Reject $H_o : b_1 = 0$; Accept $H_A : b_1 \neq 0$. Estimated slope of trend of remainder of NIAD is b_2. Do not reject $H_o : b_2 = 0$. Trend comparison test statistic ($t = 1.384$) < 1.943. Do not reject $H_o : b_1 - b_2 = 0$.

No evidence is provided by the data showing the volume of sales by other types of wholesalers to support any of the general hypotheses presented in Chapter IV.

Evidence was presented in this section in support of the general hypothesis that the wholesaling function performed by NIAD establishments is being concentrated in Mason City. The general hypothesis that the wholesaling function is performed by NIAD establishments is being concentrated among merchant wholesalers was not supported. The evidence indicated concentration among other types of wholesalers.

B. Shifts in Cerro Gordo County Wholesale Sales

Census of Business data concerning volumes and kinds of goods sold by wholesalers in a functional economic area is limited to counties with 100 or more wholesaling establishments. A comparison was made of the seven groups of goods reported sold by wholesalers in Cerro Gordo County (including Mason City) in 1958 and 1963. A shift analysis technique was employed as summarized in Table 7 to determine relative increases in sales among categories of goods.

An increase of 19.87 % was shown for all goods sold by wholesalers in the county. Four groups of goods having a greater than average increase in sales were group 501 - motor vehicles and automotive equipment; group 505 - farm products and raw materials; group 508 - machinery, equipment, and supplies; and group 509 - miscellaneous products. Group 502 - drugs, chemicals, and allied products and group 504 - groceries and related products had a smaller than average increase in sales. A combined total given for group 503 - dry goods and apparel; group 506 - electrical goods; and group 507 - hardware, plumbing, and heating equipment and supplies showed a 41 % decrease in sales in the five-year period.

Group 508 - machinery, equipment, and supplies accounted for 41 % of the upward shift in sales by groups of goods. Seventy-six per cent of the downward shift in sales by Cerro Gordo wholesalers were found in the grocery and related product

Table 7. Summary of net shifts in Cerro Gordo County wholesale sales and shifts in categories of goods, 1958-1963

	All category in Cerro Gordo County		Categories with upward shifts		Categories with downward shifts	
	(%)	($1000)	(%)	($1000)	(%)	($1000)
1. 1958		133,269		63,773		69,496
2. 1963		159,746		91,213		68,533
3. Actual increase	19.87	26,477		27,440		-963
4. (Average increase)			(19.87)	12,670	(19.87)	13,807
5. Total net shifts (the difference between actual and average growth)				+14,770		-14,770

Table 7 (Continued)

	Categories[1]							
	501		502		504		505	
	(%)	($1000)	(%)	($1000)	(%)	($1000)	(%)	($1000)
6. 1958		3,902		1,564		62,429		17,166
7. 1963		7,259		1,670		63,503		20,717
8. Actual increase	86.03	3,357	6.77	106	1.72	1,074	20.68	3,551
9. (Average increase)	(19.87)	775	(19.87)	310	(19.87)	12,404	(19.87)	3,410
10. Categories upward or downward shift (difference between actual and average growth)		+2,582		-206		-11,330		+141
11. Categories shift as percentage of total net shift (Line 10 as % of Line 5)		17.48%		1.39%		76.71%		0.95%

[1]501 - motor vehicles, automotive equipment; 502 - drugs, chemicals, allied products; 504 - groceries and related products; 505 - farm products and raw material; 508 - machinery, equipment and supplies; 503, 506, 507 - dry goods, apparel, electrical goods, hardware, plumbing, and heating equipment and supplies; 509 - miscellaneous products.

Table 7 (Continued)

	Categories[1]					
	508		503, 506, 507		509	
	(%)	($1000)	(%)	($1000)	(%)	($1000)
6. 1958		15,718		5,503		26,987
7. 1963		25,013		3,360		38,224
8. Actual increase	51.13	9,295	-38.94	-2,143	41.63	11,237
9. (Average increase)	(19.87)	3,123	(19.87)	1,093	(19.87)	5,362
10. Categories upward or downward shift (difference between actual and average growth)		+6,172		-3,276		+5,875
11. Categories shift as percentage of total net shift (Line 10 as % of Line 5)		41.79%		22.18%		39.78%

group 504. The results of the shift analysis support the general hypothesis that the trends in volumes of goods sold by Cerro Gordo County wholesale establishments vary between categories of goods.

C. Sources and Volumes of Goods Purchased by NIAD Retail Firms

Data concerning sources and volumes of specific kinds of goods purchased for resale by retail firms throughout NIAD were obtained from the NIAD Business Survey because of limitations of census data as discussed in the previous section and in Section A, Chapter IV.

Table 8 presents the total volumes of 26 categories of goods purchased for resale from four sources. This table also shows the percentage distribution of total purchases among each good and the percentage distributions of purchases from each source among the particular kind of goods. The dollar volume of each good purchased from each source is presented in Appendix B.

The total dollar volume of all purchases reported by 310 retail firms in the survey was $33,801,700. Five categories of goods accounted for 64.7 % of all purchases by the firms. These categories, ranked in order of volume, were grain; feed, seed, fertilizer, and chemicals; petroleum and petroleum products; wood, stone, concrete, and products; and all other foods and tobacco.

Table 8. Distribution of total purchases and purchases from each source by retail firms in NIAD Business Survey among types of goods

Type of good	Total volume of purchases ($1000 units)	Per cent of total purchases	Per cent of purchases from manufacturers or producers	Per cent of purchases from wholesalers located in NIAD	Per cent of purchases from wholesalers located outside NIAD in Iowa and Minnesota	Per cent of purchases from wholesalers located outside Iowa and Minnesota
Motor vehicles	1,810.5	5.35	6.61	4.72	2.08	1.53
Vehicle parts and accessories	1,422.4	4.20	1.62	8.54	11.72	.07
Personal items	230.7	.68	.10	.48	3.92	.06
Drugs and medicine	246.9	.73	.23	.24	3.74	.73
Paints and finishes	127.8	.37	.27	.37	1.03	.01
Apparel, shoes, and clothing	1,090.4	3.22	4.34	---	2.59	3.45
Meat, fish, and poultry	1,833.2	5.42	4.44	9.95	5.47	---
Beverages, pop, and beer	519.6	1.53	.52	5.75	.75	---
All other foods, tobacco	2,951.4	8.73	1.12	33.09	11.60	2.10
Grain	6,190.4	18.31	29.67	---	---	---
Plants, nursery stock, livestock, poultry, potted plants and cut flowers	867.3	2.56	4000	.30	.27	.03
Major household appliances	361.1	1.06	.65	.34	4.26	.54
Shop, carpenter lawn and garden tools and equipment	114.8	.33	.07	.26	1.84	.03
Heating, plumbing, and electric equipment and supplies	721.8	2.13	1.75	.79	2.55	9.72
Farm machinery and parts	933.8	2.76	2.83	1.25	.63	11.86
Livestock equipment, fencing and supplies	150.0	.44	.23	.59	1.21	.40
Service equipment	54.8	.16	.22	.08	.01	.06
Petroleum and petroleum products, LP gas	3,564.1	10.54	7.50	18.62	13.17	9.98
Books, magazines paper and office supplies	303.9	.89	.85	.35	.99	2.96
Furniture and floor covering	513.4	1.51	1.98	.02	1.20	2.21
Cookwares, household equipment and antiques	70.1	.20	.12	---	.97	---
Wood, stone, concrete, and products	3,249.3	9.61	12.27	5.95	4.64	4.81
Sporting goods bicycles and equipment	146.3	.43	.30	.02	1.50	.68
Other recreational supplies	268.1	.79	1.03	.02	.36	1.80
Feed, seed, fertilizer and chemicals	5,924.0	17.52	16.87	8.15	23.00	43.27
Jewelry, china, watches and gifts	135.6	.40	.23	---	.37	3.60
Total %		99.87	99.82	99.88	99.87	99.90
$	33,801.7		20,858.1	6,520.3	4,470.0	1,953.3
% of total purchased from source	99.96		61.69	19.28	13.22	5.77

Of all goods purchased 61.69 % were obtained directly from the manufacturer or producer totaling $20,858,100. Five categories of goods accounted for 72.9 % of the goods purchased from this source. They were grain; feed, seed, fertilizer, and chemicals; wood, stone, concrete, and products; petroleum and petroleum products; and motor vehicles.

The volume of goods purchased from wholesalers or jobbers who have warehouses or offices located in the NIAD area was $6,520,300, accounting for 19.28 % of total purchases. The five largest categories involved 78.3 % of the volume of purchases reported from this source. One-third of all purchases from NIAD wholesalers were in the all other foods and tobacco category. The other four leading types were petroleum and petroleum products; meat, fish, and poultry; vehicle parts and accessories; and feed, seed, fertilizer, and chemicals.

The value of goods purchased from wholesalers or jobbers whose offices or warehouses were located elsewhere in Iowa or Minnesota was $4,470,000. This is 13.22 % of the total purchases. The five leading categories consisted of 64.9 % of the purchases from this source and were the same five that led the purchases from NIAD wholesalers. They are ranked in order of volume of purchases as feed, seed, fertilizer, and chemicals; petroleum and petroleum products; vehicle parts and accessories; all other foods and tobacco; and meat, fish, and poultry.

Only 5.77 % of the total purchases were reported as being from wholesalers or jobbers whose offices or warehouses were located outside Iowa and Minnesota, amounting to $1,953,300. The five leading categories of goods which accounted for 79.6 % of the purchases from this source were feed, seed, fertilizer, and chemicals; farm machinery and parts; petroleum and petroleum products; heating, plumbing, and electric equipment and supplies; and wood, stone, concrete, and products.

Table 9 shows the percentage of total purchases of each good purchased from each of the four sources. There are six categories of goods in which each has more than 75 % of its purchases from wholesale sources. Ranked in order of total volume of purchases, they are all other foods and tobacco; vehicle parts and accessories; beverages, pop, and beer; drugs and medicines; personal items, and shop, carpenter, lawn and garden tools and equipment. Eight categories are listed in which each has more than 75 % of its purchases direct from manufacturers or producers. They are grain; wood, stone, concrete, and products; motor vehicles; apparel, shoes, and clothing; plants, nursery stock, livestock, and poultry; furniture and floor covering; other recreational supplies; and service equipment (telephones and mortuary supplies).

There are twelve other categories in which was more than 25 % of its purchases from wholesalers and more than 25 % of its purchases directly from manufacturers or producers.

Table 9. Dollar purchase of each good and percentage of good purchased from each source by retail firms in NIAD Business Survey

Type of good	Total volume of purchases ($1000 units)	Per cent	Per cent purchased direct from manufacturers or producers	Per cent purchased from wholesalers located in NIAD	Per cent purchased from wholesalers located outside NIAD in Iowa and Minnesota	Percent purchased from wholesalers located outside Iowa and Minnesota
Motor vehicles	1,810.5	99.98	76.16	17.03	5.14	1.65
Vehicle parts and accessories	1,422.4	99.98	23.89	39.15	36.85	0.10
Personal items	230.7	99.94	9.87	13.56	75.95	0.56
Drugs and medicine	246.9	100.02	19.73	6.60	67.90	5.79
Paints and finishes	127.8	99.98	44.44	19.09	36.22	0.23
Apparel, shoes, and clothing	1,090.4	99.98	83.10	0.05	10.65	6.18
Meat, fish, and poultry	1,833.2	99.97	51.22	35.40	13.35	---
Beverages, pop, and beer	519.6	99.97	21.24	72.21	6.52	---
All other foods, tobacco	2,951.4	99.73	7.90	72.91	17.53	1.39
Grain	6,190.4	99.98	93.88	6.11	---	---
Plants, nursery stock, livestock, poultry, potted plants, and cut flowers	867.3	99.97	96.23	2.28	1.40	0.06
Major household appliances	361.1	99.91	38.02	6.23	52.81	2.93
Shop, carpenter, lawn and garden tools and equipment	114.8	99.98	12.80	14.80	71.86	0.52
Heating, plumbing and electric equipment and supplies	721.8	99.99	50.75	7.14	15.79	26.31
Farm machinery and parts	933.8	99.97	63.34	8.78	3.04	24.82
Livestock equipment, fencing, and supplies	150.0	99.84	32.88	25.63	36.01	5.32
Service equipment	54.8	99.96	86.67	10.20	0.91	2.18
Petroleum and petroleum products, LP gas	3,564.1	99.98	43.92	34.07	16.52	5.47
Books, magazines paper and office supplies	303.9	98.78	57.96	7.57	14.40	18.85
Furniture and floor covering	513.4	100.01	80.71	0.37	16.50	8.43
Cookwares, household equipment and antiques	70.1	99.98	36.80	0.85	62.33	---
Wood, stone, concrete and products	3,249.3	99.98	78.76	11.95	6.38	2.89
Sporting goods, bicycles and equipment	146.3	99.98	43.81	1.02	46.00	9.15
Other recreational supplies	268.1	99.98	86.19	0.52	6.15	13.12
Feed, seed, fertilizer and chemical	5924.0	99.98	59.40	8.97	17.35	14.26
Jewelry, watches, china, and gifts	135.6	100.06	35.57	0.22	12.32	51.95
Total $	33,801.7		20,858.1	6,520.3	4,470.0	1,953.3
%	99.96		61.69	19.28	13.22	5.77

Chi-square analysis was used to test the distribution of volumes of purchases of twenty-five categories of goods among the four sources presented in Tables 8 and 9. (Grain was omitted from the analysis because it had no purchases from any wholesale source) The $X_{.995}^2$ value for 72 degrees of freedom is 106.64. If the test statistic $\left[X^2 = \Sigma (f-F)^2/F\right]$ is less than 106.64, the null hypothesis of independence of the categories of goods and sources of purchases would not be rejected. The computed test statistic $(X^2 = 13,794.29) > (X_{.995}^2 = 106.64)$ and the null hypothesis was rejected. The alternate hypothesis was accepted supporting the general hypothesis that the major sources of goods purchased by NIAD retail firms vary by type of good.

Multiple regression analysis was used to test the general hypothesis that the dollar volume of each kind of good purchased by each store from each of six sources varies with the dollar volume of the good purchased by the store, the size of town where the store is located, the distance of the store from the central city, the total dollar volume of all goods purchased by the store, the dollar volume of the good sold by the store, the total dollar volume of all goods sold by the store, the type of store, and the kind of good purchased by the store.

Table 10 shows the results of the analysis, including the computed t-values used to test null hypotheses that $b_{ij} = 0$; $i = 1, 2, \ldots, 6$; $j = 7, 8, \ldots, 14$. When $b = 0$, there is no significant relationship between the dependent variable and

Table 10. Results of multiple regression analysis of six sources of purchases on eight variables

Independent variables[2]	Dependent variables[1] Y_1 b-value	Y_1 t-value	Y_2 b-value	Y_2 t-value	Y_3 b-value	Y_3 t-value
X_7	+ 1.167	+9.689**[3]	+ 1.093	+7.021**	+ .909	+13.619**
X_8	-38.655	- .993	+16.708	+ .736	+ .001	---
X_9	+19.637	+ .689	-33.064	-1.940	+1.836	+ .081
X_{10}	+ 1.062	+5.367**	- .070	-1.563	- .357	- 4.852**
X_{11}	- .161	-1.437	- .717	-5.595**	- .113	- 2.074**
X_{12}	- 1.066	-5.752**	+ .064	+1.655	+ .291	+ 4.218**
X_{13}	-25.208	- .987	-10.036	- .676	-6.144	- .313
X_{14}	-14.730	-1.604	+17.068	+2.733**	-6.596	- .815
degrees of freedom	127		125		115	
table t-value $\alpha = .05$	1.960		1.960		1.980	
table t-value $\alpha = .01$	2.575		2.575		2.617	

[1] Y_1 - the dollar volume of each good purchased by each store directly from manufacturers or producers located in NIAD
Y_2 - the dollar volume of each good purchased by each store directly from manufacturers or producers located elsewhere in Iowa or Minnesota
Y_3 - the dollar volume of each good purchased by each store directly from manufacturers or producers located outside Iowa and Minnesota
Y_4 - the dollar volume of each good purchased by each store from wholesalers located in NIAD
Y_5 - the dollar volume of each good purchased by each store from wholesalers located elsewhere in Iowa or Minnesota
Y_6 - the dollar volume of each good purchased by each store from wholesalers located outside Iowa and Minnesota.

[2] X_7 - dollar volume of the good purchased by the store

X_8 - size of town where store is located

X_9 - distance of store from central city

X_{10} - total dollar volume of all goods purchased by the store

X_{11} - dollar volume of the good sold by the store

X_{12} - total dollar volume of all goods sold by the store

X_{13} - type of store

X_{14} - type of good.

[3] **significance at the .01 level.

Table 10 (Continued)

Independent variables [2]	Dependent variables [1]					
	Y_4		Y_5		Y_6	
	b-value	t-value	b-value	t-value	b-value	t-value
X_7	+ .229	+6.248**	+ 1.558	+12.728**	+ .095	+ .122
X_8	-12.412	-1.429	-19.788	- 1.891	+23.790	+ .393
X_9	- .249	- .037	- 1.517	- .196	+57.104	+1.274
X_{10}	- .021	- .751	- .057	- 1.018	- .049	- .101
X_{11}	+ .256	+8.693**	- 1.023	-10.043**	+ .718	+1.207
X_{12}	+ .009	+ .376	+ .040	+ .819	- .290	- .792
X_{13}	+ 2.539	+ .367	- 2.822	- .397	+ 6.075	+ .185
X_{14}	- 2.580	- .853	- .448	- .155	-14.094	- .880
degrees of freedom	343		330		57	
table t-value $\alpha = .05$	1.980		1.960		2.000	
table t-value $\alpha = .01$	2.575		2.575		2.660	

independent variable. Each test statistic is the b-value of the regression divided by the standard error of b. When the computed t-value is greater than the table t-value for the appropriate degrees of freedom and the given level of significance, the null hypothesis that b = 0 is rejected and the alternate hypothesis of correlation between the dependent variable and the independent variable is accepted.

The multiple regression analysis provided no evidence to support the hypothesis that the dollar volume of each good purchased by each store from any of the six sources varies with the size of town where the retail store is located, distance of the store from the central city, type of store, or kind of good because the null hypotheses that the b-value equaled zero for each of these variables was not rejected.

The hypothesis that the dollar volume of each good purchased by each store from wholesalers outside Iowa and Minnesota varies with each of the eight variables was not supported because the null hypotheses that each b-variable equaled zero was not rejected.

The hypothesis that the dollar volume of each good purchased by each store from NIAD wholesalers and the dollar volume of each good purchased by each store from wholesalers located elsewhere in Iowa and Minnesota vary with the dollar volume of the kind of good purchased by the store and the dollar volume of the good sold by the store was supported.

D. Shift in Purchasing Patterns

This section summarizes an attempt to determine any short-run shift in the sources of purchases by retail firms in the NIAD Business Survey. Each store reported for each kind of good the percentage purchased from each of five sources in 1964 and the similar purchasing pattern for each good five years ago if sold at that time. No data was collected concerning the dollar volumes of purchases five years ago. The five sources were manufacturers or producers located in the NIAD area, manufacturers or producers located outside the NIAD area, wholesalers or jobbers who had offices or warehouses located in the NIAD area, wholesalers or jobbers who had offices or warehouses located elsewhere in Iowa or Minnesota, and wholesalers or jobbers who had offices located outside Iowa and Minnesota.

The percentage figures of each store for each kind of good were analyzed with the ANOV model discussed in Section B, Chapter IV to identify goods having a significant change in purchasing pattern in the five-year period. Within each kind of good, the stores were divided into quartile groups based on volume of total purchases of the good. The model was designed to test any significant difference in the percentage of each kind of good purchased from each source between years and between volume quartiles.

No significant differences between years were found in the purchasing pattern of any kind of good in the analysis. Differences were noted between volume groups in seven of the twenty-five kinds of goods tested. Appendix C shows the mean percentage purchasing pattern for the two-year observations for each volume quartile within each kind of good.

Lacking evidence of any shift in the purchasing pattern of any kind of good, the general hypothesis that the shift in purchasing pattern differs among types of goods was not supported.

E. Potential Shift in Purchasing Patterns

This section presents data identifying kinds of goods which appear to have increased sales potential to NIAD retail firms by prospective wholesaling firms locating in NIAD. A procedure for determining the volume of potential shifts in purchases of each kind of good by retail firms from wholesalers outside the NIAD area to wholesalers located in NIAD was discussed in Section D, Chapter IV.

Table 11 lists the potential shifts in purchases from two groups of wholesalers outside the NIAD area for each kind of good reported in the NIAD Business Survey. The total potential shift for each kind of good is listed with the volume of current purchases from NIAD wholesalers. Table 11 also lists the amount of purchases of each kind of good from wholesalers outside NIAD which cannot be considered potential shifts due to blockages.

Table 11. Potential shifts in purchasing pattern from wholesalers outside NIAD

Type of good by standard industrial classification number	Volume of purchases from NIAD wholesalers ($1000)	Total potential shifts from other wholesalers ($1000)	Potential shifts from wholesalers outside Iowa or Minnesota ($1000)	Potential shifts from wholesalers outside NIAD in Iowa or Minnesota ($1000)	Volume of blockages to shifts from other wholesalers ($1000)	Blockages to shifts from wholesalers outside NIAD in Iowa or Minnesota ($1000)	Blockages to shift from wholesalers outside Iowa and Minnesota ($1000)
501 - motor vehicles	308.4	123.1	30.0	93.1	--8	--	--
501 - vehicle parts and accessories	556.9	209.2	1.5	207.7	316.5	316.5	--
5022 - personal items	31.3	167.2	--	167.2	9.4	8.1	1.3
5022 - drugs and medicines	16.3	176.2	13.0	163.2	5.7	4.4	1.3
5028 - paints and finishes	24.4	18.2	.3	17.9	28.4	28.4	--
503 - apparel, shoes, and clothing	.6	53.2	4.0	49.2	130.4	67.0	63.4
5044, 5046, 5047 - meat, fish, and poultry	649.1	151.5	--	151.5	93.3	93.3	--
5043, 5095 - beverages, pop, and beer	375.3	12.4	--	12.4	21.5	21.5	--
5042, 5045, 5048, 5049, 5094 - all other foods and tobacco	2,517.6	193.0	39.9	153.1	367.0	365.7	1.3
5051 - plants, livestock, nursery stock, livestock and poultry	19.8	12.8	.6	12.2	--	--	--
5064, 5065 - major household appliances	22.5	64.1	10.6	53.5	137.2	137.2	--
5072 - shop, carpenter, lawn, garden tools and equipment	17.0	44.0	.6	43.4	39.1	39.1	--
5074, 5063 - heating, plumbing, electrical equipment and supplies	51.6	257.7	178.6	79.1	46.2	34.9	11.3
5083 - farm machinery and parts	82.0	259.9	231.8	28.1	.3	.3	--
5083 - livestock equipment, fencing and supplies	38.5	20.6	--	20.6	41.5	33.5	8.0
5087 - service equipment	5.6	1.7	1.2	.5	--	--	--
5092 - petroleum and petroleum products	1,214.6	282.4	195.0	87.4	501.6	501.6	--
5096, 5082 - books, magazines, paper and office supplies	23.3	99.5	56.8	42.7	2.8	1.6	1.2
5097 - furniture and floor covering	1.9	81.2	37.5	43.7	16.0	10.2	5.8

Table 11 (Continued)

Type of good by standard industrial classification number	Volume of purchases from NIAD wholesalers ($1000)	Total potential shifts from other wholesalers ($1000)	Potential shifts from wholesalers outside Iowa or Minnesota ($1000)	Potential shifts from wholesalers outside NIAD in Iowa or Minnesota ($1000)	Volume of blockages to shifts from other wholesalers ($1000)	Blockages to shifts from wholesalers outside NIAD in Iowa or Minnesota ($1000)	Blockages to shift from wholesalers outside Iowa and Minnesota ($1000)
5097 - cookwares, household equipment and antiques	.6	29.1	--	29.1	14.6	14.6	--
5098 - wood, stone, concrete and products	388.3	160.7	94.1	66.6	141.0	141.0	--
5099 - sporting goods, bicycles and equipment	1.5	62.9	13.4	49.5	17.8	17.8	--
5099 - other recreational supplies	1.4	40.6	28.1	12.5	11.1	4.0	7.1
5099 - feed, seed, fertilizer and chemicals	531.5	1,077.4	725.2	352.2	796.2	676.2	120.0
5099 - jewelry, watches, china and gifts	.3	70.2	61.1	9.1	16.9	7.6	9.3
Total	6,520.3	3,668.8	1,723.3	1,945.5	2,745.5	2,524.5	230.0

Chi-square analysis was used to test th distribution of volumes of potential shifts and blockages amng the twenty-five kinds of goods presented in Table 11. The $X_{.995}^2$ value for 24 degrees of freedom is 45.56. If the test statistic $X^2 = \Sigma (f-F)^2/F$ is less than 45.56, the null hypothesis of independence of the kinds of goods and the factors of potential shifts and blockages would not be rejected. The computed test statistic ($X^2 = 11,405.7$) > ($X_{.995}^2 = 45.56$) and the alternate hypothesis was accepted supporting the general hypothesis that the potential shifts in purchases by NIAD retail firms from wholesalers outside NIAD to wholesalers located in NIAD vary among types of goods.

VI. SUMMARY AND CONCLUSIONS

Evidence was provided in this study to support four of the seven general hypotheses outlined in Section C, Chapter III.

The hypothesis that the wholesaling function performed by NIAD establishments is being concentrated among firms which are located in Mason City was supported. The hypothesis that the wholesaling function performed by NIAD establishments is being concentrated among merchant wholesalers was not supported because the evidence suggests a concentration of sales volumes among other types of wholesalers. Both hypotheses were tested by linear regression analysis.

The results of a shift analysis technique supported the hypothesis that the trends in volumes of goods sold by Cerro Gordo County wholesale establishments vary between categories of goods.

The results of a chi-square analysis of the distribution of volumes of purchases of twenty-five kinds of goods among four sources of purchases supported the hypothesis that the major sources of goods purchased by NIAD retail firms vary by kind of good. Multiple regression analysis supported the hypothesis that the dollar volume of each good purchased by each store from each of two wholesale sources varies with the dollar volume of the good purchased by the store and the dollar volume

of the good sold by the store. No evidence was obtained in the analysis to support the hypothesis that the dollar volume of each good purchased by each store from any source varies with the size of town where the retail store is located, the distance of the store from the central city, the type of store, or type of good.

The hypothesis that the shift in purchasing pattern varies among types of goods was not supported because no evidence of any shift in the purchasing pattern of any kind of good was found with the analysis of variance.

Chi-square analysis used to test the distribution of potential shifts and blockages among twenty-five kinds of goods provided evidence to support the hypothesis that the potential shifts in purchases by NIAD retail firms from wholesalers outside NIAD to wholesalers located in NIAD vary among kinds of goods.

This study has reviewed some theoretical concepts useful in an analysis of the wholesaling function in a functional economic area. All efforts in this study were directed towards three specific objectives. Some trends in the agency and geographic structures of wholesaling within the NIAD area were analyzed. The dollar volumes of twenty-six kinds of goods purchased for resale by NIAD retail firms from each of six sources were presented. Certain categories of goods which appear to

have increased sales potential to NIAD retail stores by prospective wholesaling firms locating in NIAD were identified by determining the potential shifts in purchases for each kind of good.

The results obtained in this study should be useful to those both within NIAD and outside the area who are concerned with wholesaling in the functional economic area. The procedures used may also be of interest to researchers planning a study of wholesaling in similar functional economic areas.

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APPENDIX A

Table 12. Number of wholesale establishments, annual wholesale sales and annual retail sales of counties, Mason City and remainder of NIAD by years[1]

Area (county)	1948				1954			
	Number of wholesale establishment	Annual wholesale ($1000)	Annual retail sales ($1000)	Wholesale/retail ratio	Number of wholesale establishment	Annual wholesale ($1000)	Annual retail sales ($1000)	Wholesale/retail ratio
Butler	47	17,157	16,239		42	17,781	20,583	
Cerro Gordo	113	54,922	56,527		126	103,373	67,206	
Floyd	55	17,832	18,562		44	21,265	22,329	
Franklin	41	18,810	13,784		40	17,302	18,730	
Hancock	57	26,780	11,700		38	25,478	17,374	
Mitchell	30	12,273	13,792		28	12,444	15,309	
Winnebago	29	15,492	13,788		29	14,211	16,434	
Worth	21	10,632	7,687		22	8,164	9,106	
Wright	52	29,633	18,559		52	26,699	23,502	
Total NIAD	445	203,531	170,818	1.192	421	246,717	210,573	1.172
Mason City	79	42,867	45,929	.933	96	93,865	51,325	1.829
Remainder of NIAD	366	160,664	124,889	1.286	325	151,852	159,248	.960

[1]Actual sales figure withheld to avoid disclosure. Estimate based on assumption of 1948-1954 % increase in Hancock County equal to % increase in total NIAD - Hancock County - Mason City.

Table 12 (Continued)

Area (county)	1958				1963			
	Number of wholesale establishment	Annual wholesales ($1000)	Annual retail sales ($1000)	Wholesale/retail ratio	Number of wholesale establishment	Annual wholesales ($1000)	Annual retail sales ($1000)	Wholesale/retail ratio
Butler	53	22,733	22,533		54	30,312	23,656	
Cerro Gordo	137	133,269	74,071		143	159,746	83,694	
Floyd	52	27,124	23,124		45	25,346	27,806	
Franklin	44	20,480	19,346		38	18,184	24,977	
Hancock	48	40,937	16,313		45	30,970	21,922	
Mitchell	37	17,667	17,062		36	19,012	20,497	
Winnebago	39	19,247	18,155		31	15,854	20,164	
Worth	30	13,396	9,545		29	12,742	10,975	
Wright	49	22,042	24,988		56	26,617	28,223	
Total NIAD	489	316,895	225,147	1.408	477	338,783	261,914	1.293
Mason City	95	118,192	57,353	2.061	105	140,101	61,999	2.260
Remainder of NIAD	394	198,703	167,794	1.184	372	198,682	199,915	.994

Table 13. Concentration of NIAD wholesaling by kind of agency in counties, Mason City and remainder of NIAD by years

Area (county)	1948		1954		1958		1963	
	Merchant wholesalers ($1000)	Other types ($1000)	Merchant wholesalers ($1000)	Other types ($1000)	Merchant wholesalers ($1000)	Other types ($1000)	Merchant wholesalers ($1000)	Other types ($1000)
Butler	1,149	16,008	292	17,489	4,071	18,662	(D)	(D)
Cerro Gordo	23,516	31,406	30,547	72,826	46,591	86,678	53,793	105,953
Floyd	2,913	14,919	2,380	18,885	3,550	23,574	4,914	20,432
Franklin	814	17,996	3,925	13,377	3,642	16,838	3,365	14,819
Hancock	2,707	24,073	(D)	(D)	6,660	34,277	2,772	28,198
Mitchell	1,039	11,234	2,155	10,289	3,341	14,326	422	18,590
Winnebago	810	14,682	4,692	9,519	5,558	13,689	724	15,130
Worth	(D)	(D)		8,164	2,022	11,374	3,405	9,337
Wright	3,213	26,420	5,856	20,843	(D)	(D)	5,313	21,304
Total NIAD	36,131	156,738	49,847	171,392	75,435	219,418	74,078	233,763
Mason City	22,161	20,706	28,717	65,148	44,100	74,092	52,422	87,679
Remainder of NIAD	14,000	136,032	21,130	106,244	31,335	145,326	21,656	146,084

(D) - census reported figure withheld to avoid disclosure.

APPENDIX B

Table 14. Sources and volumes of goods purchased by retail firms in NIAD Business Survey

Type of good by standard industrial classification number	Total volume of purchases ($1000 units)	Dollar volume purchased direct from manufacturers or producers located in NIAD ($1000 units)	Dollar volume purchased direct from manufacturers or producers located outside NIAD in Iowa or Minnesota ($1000 units)	Dollar volume purchased direct from manufacturers or producers located outside Iowa or Minnesota ($1000 units)	Dollar volume purchased from wholesalers located in NIAD ($1000 units)	Dollar volume purchased from wholesalers located outside NIAD in Iowa or Minnesota ($1000 units)	Dollar volume purchased from wholesalers located outside Iowa or Minnesota ($1000 units)
501 - motor vehicles	1,810.5	—	—	1,379.0	308.4	93.1	30.0
501 - vehicle parts and accessories	1,422.4	—	164.3	175.5	556.9	524.2	1.5
5022 - personal items	230.7	—	—	22.8	31.3	175.3	1.3
5022 - drugs and medicines	246.9	—	9.9	38.8	16.3	167.6	14.3
5028 - paints and finishes	127.8	2.6	5.4	48.8	24.4	46.3	.3
503 - apparel, shoes, and clothing	1,090.4	1.5	33.2	871.5	.6	116.2	67.4
5044, 5045, 5047- meat, fish, and poultry	1,833.2	606.5	287.2	45.6	649.1	244.8	—
5043, 5095 - beverages, pop, and beer	519.6	96.1	10.0	4.3	375.3	33.9	—
5042, 5045, 5048, 5049, 5094 - all other foods and tobacco	2,951.4	154.1	62.2	17.5	2,157.6	518.8	41.2
5051 - grain	6,190.4	5,812.1	378.3	—	—	—	—
5051 - plants, nursery stock, livestock, poultry, potted plants and cut flowers	876.3	561.0	166.7	107.0	19.8	12.2	.6
5064, 5065 - major household appliances	361.1	2.0	64.8	70.5	22.5	190.7	10.6
5072 - shop, carpenter, lawn and garden tools and equipment	114.8	—	14.7	—	17.0	82.5	.6
5074, 5063 - heating, plumbing and electric equipment and supplies	721.8	4.5	214.5	147.3	51.6	114.0	189.9
5083 - farm machinery and parts	933.8	1.2	315.8	274.6	82.0	28.4	231.8
5083 - livestock equipment, fencing and supplies	150.0	—	16.0	33.4	38.5	54.1	8.0
5087 - service equipment	54.8	—	13.7	33.8	5.6	.5	1.2

Table 14 (Continued)

Type of good by standard industrial classification number	Total volume of purchases ($1000 units)	Dollar volume purchased direct from manufacturers or producers located in NIAD ($1000 units)	Dollar volume purchased direct from manufacturers or producers located outside NIAD in Iowa or Minnesota ($1000 units)	Dollar volume purchased direct from manufacturers or producers located outside Iowa or Minnesota ($1000 units)	Dollar volume purchased from wholesalers located in NIAD ($1000 units)	Dollar volume purchased from wholesalers located outside NIAD in Iowa or Minnesota ($1000 units)	Dollar volume purchased from wholesalers located outside Iowa or Minnesota ($1000 units)
5092 - petroleum, and petroleum products, LP gas	3,564.1	30.5	325.7	1,209.3	1,214.6	589.0	195.0
5096, 5082 - books, magazines, paper and office supplies	303.9	—	79.0	99.3	23.3	44.3	58.0
5097 - furniture and floor covering	513.4	.6	35.2	378.5	1.9	53.9	43.3
5097 - cookware, household equipment and antiques	70.1	.6	.2	25.0	.6	43.7	—
5098 - wood, stone, concrete and products	3,249.3	429.6	172.5	1,957.2	388.3	207.6	94.1
5099 - sporting goods, bicycles and equipment	146.3	.1	49.8	14.2	1.5	67.3	13.4
5099 - other recreational supplies	268.1	10.5	5.0	199.5	1.4	16.5	35.2
5099 - feed, seed fertilizer and chemicals	5,924.0	1,256.1	1,914.1	348.7	531.5	1,028.4	845.2
5099 - jewelry, watches, china and gifts	135.6	—	29.9	18.3	.3	16.7	70.4
Total	33,801.7	8,969.6	4,368.1	7,520.4	6,520.3	4,470.0	1953.3
Per cent of total NIAD purchases purchased from source	99.96	26.53	12.92	22.24	19.28	13.22	5.77

APPENDIX C

Table 15. Mean percentage purchasing pattern for each kind of good by sources of purchase, volume, quartile and year

Type of good by standard industrial classification number	Volume quartile	Year	Source[1] 1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
501 - motor vehicles	high	1959	-	90.0	10.0	-	-
		1964	-	90.0	10.0	-	-
	2	1959	-	100.0	-	-	-
		1964	-	100.0	-	-	-
	3	1959	-	-	10.0	80.0	10.0
		1964	-	-	60.0	30.0	10.0
	low	1959	-	50.0	10.0	40.0	-
		1964	-	50.0	10.0	40.0	-
501 - vehicle parts and accessories (Source 1**)	high	1959	-	40.7	38.3	21.0	-
		1964	-	38.7	49.3	12.0	-
	2	1959	8.1	6.0	56.8	28.2	.9
		1964	0.0	14.1	56.8	28.2	.9
	3	1959	-	-	75.5	24.5	-
		1964	-	-	75.5	24.5	-
	low	1959	-	9.8	58.7	31.3	.2
		1964	-	9.8	58.7	31.3	.2
5022 - personal items	high	1959	-	14.0	33.3	52.7	-
		1964	-	14.0	29.2	56.8	-
	2	1959	-	.8	13.3	85.8	-
		1964	-	.8	13.3	85.8	
	3	1959	-	8.3	12.5	62.5	16.7
		1964	-	8.3	12.5	62.5	16.7
	low	1959	-	16.7	50.0	33.3	-
		1964	-	16.7	33.3	50.0	-
5022- drugs and medicines	high	1959	-	18.7	7.5	67.5	6.3
		1964	-	18.7	7.5	67.5	6.3
	2	1959	-	10.0	-	90.0	-
		1964	-	10.0	-	90.0	-
	3	1959	-	-	-	75.0	25.0
		1964	-	-	-	75.0	25.0
	low	1959	-	-	40.0	60.0	-
		1964	-	-	20.0	80.0	-
5028 - paints and finishes	high	1959	-	35.0	23.0	42.0	-
		1964	-	35.0	23.0	42.0	-
	2	1959	-	40.0	20.0	40.0	-
		1964	-	40.0	20.0	40.0	-
	3	1959	-	20.0	-	80.0	-
		1964	-	20.0	-	80.0	-
	low	1959	33.3	29.2	29.2	8.3	-
		1964	25.0	29.2	37.5	8.3	-

[1]Sources - (1) from manufacturers or producers located in the NIAD area; (2) from manufacturers or producers located outside the NIAD area; (3) from wholesalers or jobbers who had offices or warehouses located in the NIAD area; (4) from wholesalers or jobbers who had offices or warehouses located elsewhere in Iowa and Minnesota; and (5) from wholesalers or jobbers who had offices located outside Iowa and Minnesota.

**F test for differences between volume quartiles significant at 0.01 level.

Table 15 (Continued)

Type of good by standard industrial classification number	Volume quartile	Year	Source[1] 1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
503 - apparel, shoes, and clothing	high	1959	9-	94.0	-	5.0	1.0
		1964	-	94.0	-	5.0	1.0
	2	1959	-	57.0	-	22.0	21.0
		1964	-	57.0	-	22.0	21.0
	3	1959	15.0	44.0	-	26.0	15.0
		1964	15.0	44.0	-	26.0	15.0
	low	1959	-	20.0	38.0	42.0	-
		1964	-	20.0	18.0	62.0	-
5044, 5046, 5047 - meat, fish, and poultry	high	1959	26.7	23.3	34.0	16.0	-
		1964	26.7	23.3	29.0	21.0	-
	2	1959	55.5	32.0	10.0	2.5	-
		1964	44.5	45.5	10.0	-	-
	3	1959	16.4	24.5	50.9	8.2	-
		1964	23.2	20.4	39.1	17.3	-
	low	1959	36.4	10.0	37.3	16.4	-
		1964	25.9	10.0	51.4	12.7	-
5043, 5095 - beverages, pop and beer (Source 1**) (Source 3**)	high	1959	15.7	1.4	72.8	10.1	-
		1964	15.7	1.4	72.8	10.1	-
	2	1959	26.2	7.1	57.4	9.3	-
		1964	26.2	7.1	57.4	9.3	-
	3	1959	57.3	17.7	19.3	5.7	-
		1964	57.3	17.7	19.3	5.7	-
	low	1959	76.7	3.3	18.3	1.7	-
		1964	76.7	3.3	18.3	1.7	-
5042, 5045, 5048, 5049 5094 - all other foods and tobacco (Source 3***)	high	1959	17.7	.5	67.9	13.8	.1
		1964	10.0	.5	67.9	21.5	.1
	2	1959	16.9	-	76.9	4.6	1.5
		1964	20.0	-	68.4	10.5	1.1
	3	1959	4.3	4.6	54.0	37.1	-
		1964	4.3	4.6	66.7	24.4	-
5051 - grain	high	1959	100.0	-	-	-	-
		1964	100.0	-	-	-	-
	2	1959	100.0	-	-	-	-
		1964	100.0	-	-	-	-
	3	1959	100.0	-	-	-	-
		1964	100.0	-	-	-	-
	low	1959	100.0	-	-	-	-
		1964	100.0	-	-	-	-
5051 - plants, nursery stock, livestock, poultry	high	1959	50.0	50.0	-	-	-
		1964	50.0	50.0	-	-	-
	2	1959	28.3	40.0	31.7	-	-
		1964	28.3	40.0	31.7	-	-
	3	1959	5.0	95.0	-	-	-
		1964	38.3	61.7	-	-	-
	low	1959	63.0	37.0	-	-	-
		1964	64.7	35.3	-	-	-

**F test for differences between volume quartiles significant at 0.01 level.
***F test for volume x years interaction significant at 0.05 level.

Table 15 (Continued)

Type of good by standard industrial classification number	Volume quartile	Year	Source[1] 1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
5064, 5065 - major household appliances	high	1959	-	32.5	16.7	48.3	2.5
		1964	-	40.8	12.5	44.2	2.5
	2	1959	-	-	8.3	91.7	-
		1964	-	1.7	4.2	91.7	2.5
	3	1959	-	16.7	-	83.3	-
		1964	-	16.7	11.7	71.7	-
	low	1959	14.3	0.0	32.1	53.6	-
		1964	14.3	0.0	32.1	53.6	-
5072 - shop, carpenter lawn, garden tools and	high	1959	-	-	50.0	50.0	-
		1964	-	-	25.0	75.0	-
	2	1959	20.0	-	20.0	58.0	2.0
		1964	-	-	30.0	68.0	2.0
	3	1959	20.0	0.0	30.0	50.0	-
		1964	-	20.0	20.0	60.0	-
	low	1959	-	10.0	20.0	70.0	-
		1964	-	10.0	20.0	70.0	-
5074, 5063 - heating, plumbing, electrical equipment and supplies	high	1959	-	42.0	9.0	25.0	24.0
		1964	-	42.0	9.0	25.0	24.0
	2	1959	-	42.0	6.0	37.0	15.0
		1964	-	42.0	6.2	36.8	15.0
	3	1959	-	-	57.0	43.0	-
		1964	10.0	6.0	37.0	47.0	-
	low	1959	-	-	40.0	60.0	-
		1964	-	-	40.0	60.0	-
5083 - farm machinery and parts (Source 1**) (Source 2*)	high	1959	-	56.7	8.3	3.3	31.7
		1964	-	56.7	8.3	3.3	31.7
	2	1959	47.5	23.7	21.3	7.5	-
		1964	-	46.2	28.8	17.5	7.5
	3	1959	-	-	50.0	50.0	-
		1964	-	-	50.0	50.0	-
	low	1959	-	-	75.0	25.0	-
		1964	-	-	75.0	25.0	-
5083 - livestock equipment, fencing, and supplies (Source 3**)	high	1959	-	19.0	1.0	80.0	-
		1964	-	21.0	1.0	78.0	-
	2	1959	-	76.0	20.0	4.0	-
		1964	-	66.0	30.0	4.0	-
	3	1959	-	40.0	22.0	38.0	-
		1964	-	40.0	2.0	58.0	-
	low	1959	16.7	40.0	24.2	19.2	-
		1964	-	40.0	49.2	10.8	-
5092 - petroleum and petroleum products (Source 1**) (Source 2**)	high	1959	-	54.4	27.3	9.2	9.1
		1964	-	54.4	27.3	9.2	9.1
	2	1959	7.7	19.5	72.7	-	-
		1964	7.7	19.5	72.7	-	-
	3	1959	-	9.1	90.9	-	-
		1964	-	9.1	90.9	-	-
	low	1959	-	-	89.6	10.4	-
		1964	-	-	81.2	18.8	-

*F test for differences between volume quartiles significant at 0.05 level.
**F test for differences between volume quartiles significant at 0.01 level.

Table 15 (Continued)

Type of good by standard industrial classification number	Volume quartile	Year	Source[1] 1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
5096, 5082 - books, magazines and paper supplies	high	1959	-	35.7	14.3	25.5	24.5
		1964	-	35.7	14.3	25.5	24.5
	2	1959	-	10.8	53.3	29.2	6.7
		1964	-	10.8	53.3	29.2	6.7
	3	1959	-	-	16.7	73.3	10.0
		1964	-	-	16.7	73.3	10.0
	low	1959	-	16.7	37.5	45.8	-
		1964	-	16.7	29.2	54.2	-
5097 - furniture and floor covering (Source 4**)	high	1959	80.0	-	-	5.0	15.0
		1964	-	80.0	-	5.0	15.0
	2	1959	-	100.0	-	-	-
		1964	-	100.0	-	-	-
	3	1959	-	75.0	-	25.0	-
		1964	-	50.0	-	40.0	10.0
	low	1959	-	15.0	-	85.0	-
		1964	-	20.0	-	80.0	-
5097 - cookwares and household equipment	high	1959	-	33.3	33.3	33.4	-
		1964	-	33.3	-	66.7	-
	2	1959	-	-	-	100.0	-
		1964	-	-	-	100.0	-
	3	1959	-	-	-	100.0	-
		1964	-	-	-	100.0	-
	low	1959	-	-	66.7	33.3	-
		1964	-	-	-	100.0	-
5098 - wood, stone, concrete and products (Source 3*)	high	1959	16.7	63.3	16.7	3.3	-
		1964	16.7	63.3	16.7	3.3	-
	2	1959	33.3	30.0	25.0	11.7	-
		1964	33.3	30.0	25.0	11.7	-
	3	1959	5.0	26.7	-	28.3	40.0
		1964	5.0	26.7	-	28.3	40.0
	low	1959	25.0	50.0	-	-	25.0
		1964	37.5	50.0	-	-	12.5
5099 - sporting goods bicycles and equipment	high	1959	-	32.5	25.0	37.5	5.0
		1964	-	32.5	-	62.5	5.0
	2	1959	-	-	-	81.2	18.8
		1964	-	-	2.5	78.7	18.8
	3	1959	-	-	8.5	91.5	-
		1964	-	-	-	100.0	-
	low	1959	2.5	-	22.5	50.0	-
		1964	2.5	25.0	22.5	25.0	-
5099 - other recreational supplies	high	1959	1.7	31.7	-	3.3	63.3
		1964	1.7	31.7	2.3	-	64.3
	2	1959	-	33.3	-	66.7	-
		1964	-	33.3	-	66.7	-
	3	1959	-	-	18.7	81.3	-
		1964	-	-	18.7	81.3	-
	low	1959	-	-	-	50.0	50.0
		1964	-	-	-	50.0	50.0

*F test for differences between volume quartile significant at 0.05 level.
** F test for differences between volume quartile significant at 0.01 level.

Table 15 (Continued)

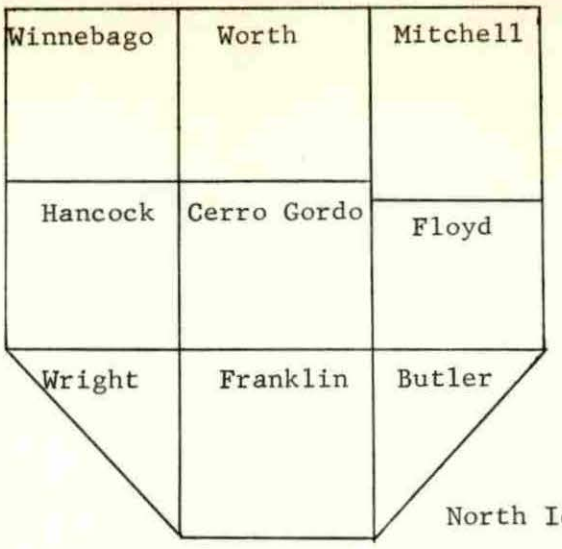
Type of good by standard industrial classification number	Volume quartile	Year	Source[1] 1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
5099 - feed, seed, fertilizer and chemicals	high	1959	23.8	44.6	6.6	11.9	13.1
		1964	22.1	46.1	6.4	12.3	13.1
	2	1959	26.0	42.4	27.9	3.1	.6
		1964	26.0	42.4	27.9	3.1	.6
	3	1959	31.0	13.1	19.4	36.5	-
		1964	31.0	12.6	19.4	37.0	-
	low	1959	11.1	55.5	11.1	22.2	-
		1964	11.1	44.4	22.2	22.2	-
5099 - jewelry, watches china, and gifts (Source 3*)	high	1959	-	37.5	-	16.2	46.3
		1964	-	47.5	-	6.2	46.3
	2	1959	-	12.5	-	56.3	31.2
		1964	-	12.5	-	56.3	31.2
	3	1959	-	45.0	-	55.0	-
		1964	-	45.0	-	55.0	-
	low	1959	-	-	50.0	10.0	40.0
		1964	-	-	30.0	30.0	40.0

*F test for differences between volume quartiles significant at 0.05 level.

APPENDIX D

NAID Business Survey Questionnaire

NIAD



North Iowa Area Development

Dear Friend:

The North Iowa Area Development Committee, commonly called NIAD, is an organization of volunteer leaders whose objective is to study the economic and social problems of North Central Iowa. The Business and Industry sub-committee of NIAD would like to obtain some basic information on the source of wholesale supplies in this area. This information will be useful in determining the wholesaling potential in the North Iowa Area, and will help with predictions of business trends.

We have requested that Iowa State University in Ames prepare this information and make it available to all interested persons in the NIAD area. Ivan Lappin, Area 4-H Leader from Osage, will be conducting this research project. Your cooperation will be appreciated.

The research project consists of a survey asking for the sources of your purchases and the size of your business. The information that you give will be strictly confidential. You need not sign the questionnaires. Please answer all questions completely and accurately. This is imperative to the success of this project.

Thank you for your cooperation.

Sincerely,

B. E. Throndsen

B. E. Throndsen, Chairman
Business and Industry Committee

Business Questionnaire 95 - Part I

1. Please check the areas below in which you normally make purchases.

Merchandise purchased for resale.

____ Meat, including fish and poultry.
____ Beverages, pop, beer.
____ All other foods and food products.
____ Personal items -- soap, toothpaste, cosmetics, perfumes, shaving equipment, etc.
____ Drugs, prescription medicines, remedies, and supplies.
____ Books, magazines, stationery, paper, pencils, etc.
____ Sporting goods, bicycles, and equipment.
____ Other recreational supplies -- cameras and supplies, toys, games, etc.
____ Apparel, shoes and clothing.
____ Furniture and floor covering.
____ Major household appliances -- stoves, washers, TV sets, phonographs, etc.
____ Cookware and household equipment other than major appliances.
____ Jewelry, watches, silver, china, luggage, etc.
____ Shop, carpenter, lawn, and garden tools and equipment.
____ Petroleum and petroleum products.
____ Motor vehicles.
____ Motor vehicle parts and accessories.
____ Farm machinery and parts.
____ Livestock equipment, fencing, and supplies.
____ Feed, seed, fertilizer and chemicals.
____ Plants, nursery stock, livestock and poultry.
____ Paints and finishes, wallpaper.
____ Wood, stone, concrete and products.
____ Heating, plumbing, and electrical equipment and supplies.
____ Other types of merchandise not listed above. (Please list)
____ _____
____ _____

For each of the areas that you have checked above, please complete Part II of this questionnaire.

96a

Please give your business work force situation now and 5 years ago, by type of job classification. Include yourself.

Also include the weekly salaries of employees, both starting and experienced, by type of job classification. Include your own salary if you receive one.

TYPE OF JOB CLASSIFICATION	Current Number of employees in each job classification.	Number of employees in each job classification 5 years ago.	Current weekly starting salary in each job classification.	Current weekly salary for experienced workers in each job classification.
1. Professional, Technical, and kindred workers. (Engineers, Nurses, IBM technicians, Scientists medical technicians, lab technicians etc.)				
2. Managers, officials, and proprietors. (Department heads, store managers, owners, plant managers, sales managers, buyers, etc.)				
3. Clerical and kindred workers. (Typist, stenographer, office machine operators, receptionists, etc.)				
4. Sales workers. (Store clerks, store salesmen, wholesale or retail sales, etc.)				
5. Craftsmen, foremen, and kindred workers. (Electricians, plumbers, supervisory foreman not part of management, etc.)				
6. Operatives and kindred workers. (Machine operators, heavy equipment operators, truck drivers, etc.)				
7. Service workers. (Repairmen, custodians, laundry, dry cleaning, etc.)				
8. Laborers. (Unskilled, stockmen, handlers, etc.)				

How many employees would you add or lay off if you experienced the following sustained changes in your volume of business? 96b

10% increase, add _____ employees

20% increase, add _____ employees

30% increase, add _____ employees

10% decrease, lay off _____ employees

20% decrease, lay off _____ employees

30% decrease, lay off _____ employees

The following to be completed by the operator or manager of the business.

Your Age

Under 25 _____
25 - 34 _____
35 - 44 _____
45 - 54 _____
55 - 64 _____
65 & over _____

Training programs and short courses pertaining to your business you have attended:

_____ months.

When did you last attend a training program or short course?

_____ (Year)

Years of experience you had in the business before becoming operator or manager.

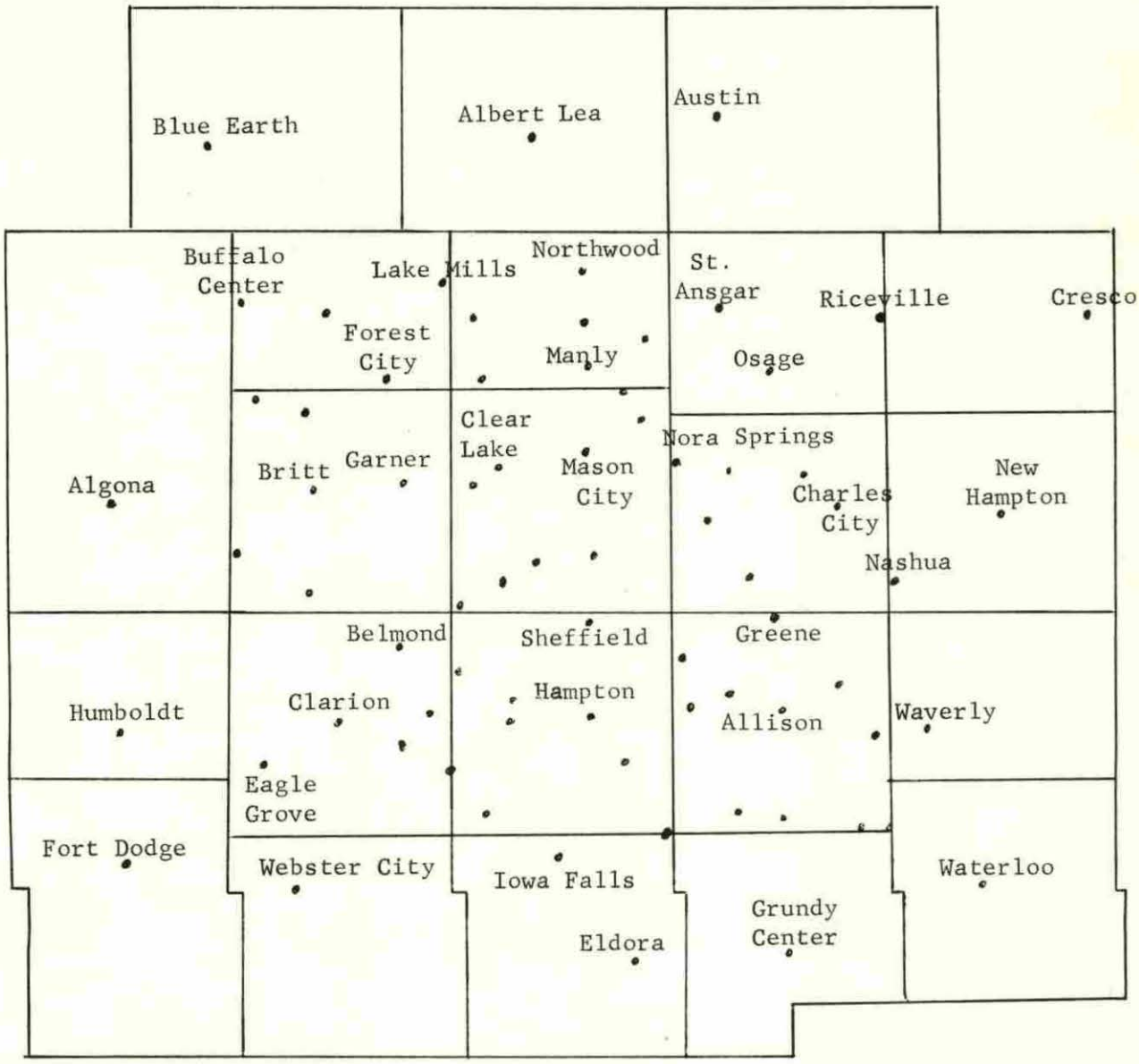
_____ years.

Other training you have had for your business. (High school, college, business school, etc.)

Type _____ Length _____

_____ _____

Using the map below, please circle the trade area you attempt to serve.



Thank you for your cooperation.

Business Questionnaire -- Part II

Type of Merchandise _____ 98 _____ Annual Dollar Purchase $_____
Annual Dollar Sales $_____

1. Of this type of merchandise, we buy:

_____% directly from manufacturers or producers who are located in the NIAD area. The major reasons for buying from this source are: (please rank in order of importance)

___ price ___ quality of product ___ convenience
___ better service ___ brand of product Other reasons (pleast list)
_____

_____% directly from manufacturers or producers who are located outside the NIAD area. They are located:

___ elsewhere in Iowa or Minnesota ___ outside Iowa and Minnesota

The major reasons for buying from this source are: (please rank in order of importance)

___ price ___ quality of product ___ convenience
___ better service ___ brand of product Other reasons (please list)
_____

_____% from wholesalers or jobbers who have warehouses located in the NIAD area. The major reasons for buying from this source are: (please rank in order of importance)

___ price ___ quality of product Other reasons (please list)
___ better service ___ brand of product _____
___ chain store connection ___ convenience _____

_____% from wholesalers or jobbers whose warehouses are located elsewhere in Iowa or Minnesota. The major reasons for buying from this source are: (please rank in order of importance)

___ price ___ quality of product Other reasons (please list)
___ better service ___ brand of product _____
___ chain store connection ___ convenience _____

_____% from wholesalers or jobbers whose warehouses are located outside Iowa or Minnesota. The major reasons for buying from this source are: (please rank in order of importance)

___ price ___ quality of product Other reasons (please list)
___ better service ___ brand of product _____
___ chain store connection ___ convenience _____

2. Five years ago we bought:

_____% direct from manufacturers or producers located in the NIAD area.
_____% direct from manufacturers or producers who were not located in the NIAD area.
_____% from wholesalers or jobbers who had offices or warehouses located in NIAD.
_____% from wholesalers or jobbers who had offices or warehouses located elsewhere in Iowa or Minnesota.
_____% from wholesalers or jobbers who had offices or warehouses located outside Iowa or Minnesota.

3. If the percentages in question 2 are different from those in question 1, why did you change your wholesale purchasing pattern? Please be specific.

_____

_____