OECD Economics Department Working Papers No. 135

An Analysis of the U.S. Distribution System

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https://dx.doi.org/10.1787/587542107024

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GENERAL DISTRIBUTION
OCDE/GD (93)169

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This paper forms part of an OECD project which addressed the issue of the structure and change in the distribution systems of seven OECD countries.

The paper begins with a conceptual framework describing the functions, market outcomes and economic implications of the distribution sector. Next, it gives an overview of the U.S. distribution system in the 1980s. In particular, it discusses some specific characteristics underlying the functioning of the U.S. distribution system. Finally, it assesses the efficiency question and its implications for foreign trade. Some policy recommendations are then drawn on that basis.

* * *

Ce document fait partie d'un projet de l'OCDE qui avait pour objet l'analyse de la structure et des changements dans les systèmes de distribution dans sept pays de l'OCDE.

Tout d'abord, cette étude propose un modèle conceptuel des fonctions, caractéristiques de marché et implications pour l'économie du secteur de la distribution. Ensuite, elle donne une vue d'ensemble du système de distribution dans les États-Unis dans les années quatre-vingts. En particulier, elle analyse les facteurs spécifiques qui déterminent le fonctionnement du secteur de la distribution aux U.S.A. En dernier lieu, elle fournit un évaluation de l'efficacité économique et sa portée sur le commerce extérieur ce qui permet de tirer quelques recommandations de politique économique.

Contents

I. Introduction

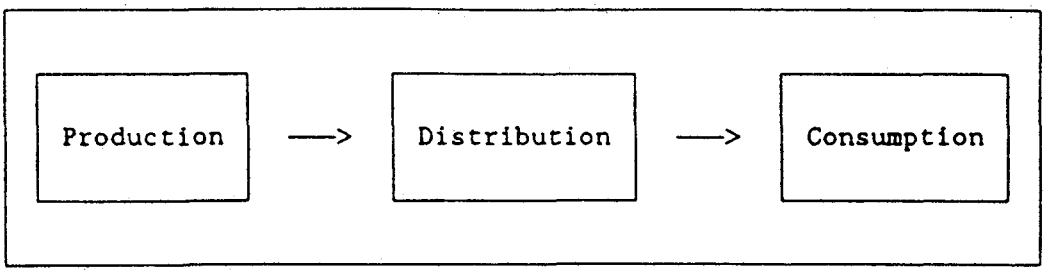
Our main tasks are to understand the functioning of the U.S. distribution sector and to assess the efficiency of its operations and its implications for foreign trade. Understanding the structure and operation of any distribution system requires a conceptual framework in which to embed the discussion. To facilitate the exposition we present a conceptual framework systematically and in some detail in Section II. The reader who is familiar with the nature of distribution systems can proceed quickly to Section III, where we provide an overview of the size, structure and operations of the U.S. distribution sector. Important factors in determining the functioning of the U.S. distribution sector are analyzed in Section IV. An assessment of the efficiency of this sector and its implications for foreign trade is provided in Section V. A concluding section highlights policy implications.

II. Conceptual Framework

1. Economic Function of the Distribution Sector

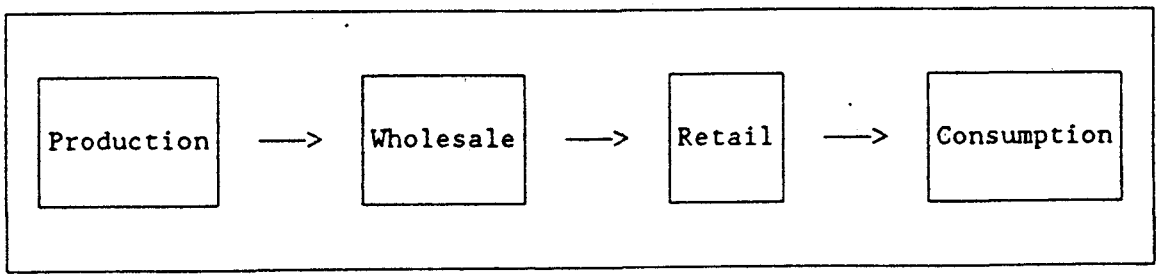
As indicated by Ordover and Rey (1991), distribution systems should be evaluated in terms of their ability to satisfy consumer wants. Their function in the economic system is to transfer goods and services from producers to consumers in an efficient manner. At this level of abstraction, efficiency can be defined as providing the attributes consumers demand in a cost minimizing manner. This process is described most simply in the scheme represented in Fig 1.

Fig. 1. Abstract Representation of Distribution Function



While the above representation provides a useful starting point, its application to any actual distribution system requires a number of modifications. In the first place performance of the distribution function in most societies has led to the emergence and evolution (including in some cases demise) of specialized institutions that perform various aspects of this distribution function. At the most aggregate level, one can begin to capture this process by separating the distribution function into its two main components: namely the wholesale function and the retail function. Including this consideration leads to a simple modification of the scheme which is presented in Fig. 2.

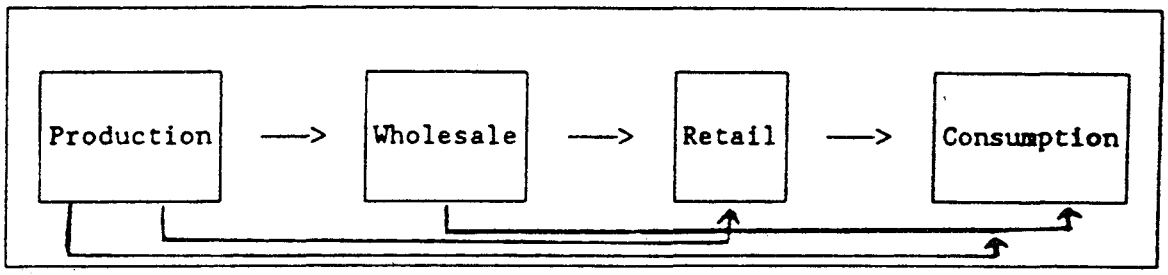
Fig. 2. Main Separation of Distribution Function



Implicit in the above representation is a sequential process in the performance of each function. Nevertheless, in practice, one observes

institutional forms[1] in the performance of the distribution function that alter the prototype sequence depicted in Fig. 2. For instance, manufacturers can distribute their products directly to retailers by internalizing the wholesaling function, which is an example of (forward) vertical integration. Retailers also can, of course, internalize the wholesaling function which is an example of (backward) vertical integration. Depicting various possible outcomes, not all of which need be realized in a particular system, leads to Fig. 3.

Fig. 3. Potential Sequences in the Performance of the Distribution Function



2. Two Essential Characteristics of Retail Systems

Our relatively simple abstract world has now become considerably more complex as a result of the existence of different institutional forms in which the distribution function can be performed. Moreover, the discussion, thus far, ignores two essential characteristics of distribution systems that have been analyzed in the context of retailing, Betancourt and Gautschi (1992b), but which are equally applicable to wholesaling and other interactions among firms, as we shall demonstrate below.

One fundamental characteristic of retail enterprises is that they deliver

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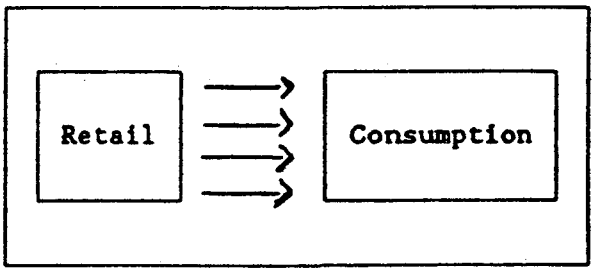
[1]Incidentally, an institution is any restriction or constraint on the behavior of agents, whether of a formal or an informal nature, Nabli and Nugent (1989, ch 1). Hence, the performance of functions in any particular sequence generates an institutional form.

goods or services to customers together with a variety of distribution services. One can identify at least five broad categories of distribution services—namely, accessibility of location, product assortment, assurance of product delivery, information and ambiance.[2] Moreover, for some purposes one may want to identify additional dimensions of these services. For instance, assortment can be further subdivided into depth (variety within a product line) and breadth (number of different product lines); similarly, assurance of product delivery can be broken down into at least three different dimensions (at the desired time, in the desired size, or in the desired ownership status). Before exploring the economic consequences of this characteristic, it is useful to indicate its impact on the schematic representation of the distribution function in Fig. 3. To illustrate without clutter, we present in Fig. 4 the role of several distribution services in the performance of the distribution function between the retail system and the consumption sector.

Fig. 4. The Role of Distribution Services in the Performance of the Distribution Function



Jointness in the supply of distribution services and the goods or services to be transferred from the retailer to the consumer leads to at least six

[2]Descriptions of these distribution services in various institutional settings and how they have been discussed in the literature are available in Betancourt and Gautschi (1986, 1990).

different types of mechanisms for interactions between the two sectors in the performance of the distribution function. Indeed, once we allow for the multi-dimensional nature of the goods and services transferred the possibilities are so numerous that they cannot be described in simple schematic representations. Hence, it is useful to introduce at this point an economic characterization of the process. A useful way of characterizing the retailer is as a multi-product firm that produces a set of explicit items to be transferred to the consumer together or jointly with a set of distribution services that also play the role of outputs of the retail firm. The main economic consequence of this characterization of the retailer's behavior is that cost minimization implies that its actions can be analyzed in terms of a multi-product cost function. Hence, the production of higher levels of outputs, including the subset of outputs consisting of distribution services, leads to higher costs.[3]

Up to now the behavior of the consumption sector has been represented in a passive fashion as the recipient of goods and services together with distribution services from the retail sector. This obscures a fundamental characteristic of consumption behavior. In their purchasing activities consumers experience a set of distribution costs[4] that can be higher or lower depending on the activities of the consumers. This introduces a second fundamental characteristic of retail markets: namely, the existence of cost shifting between the retail sector and the consumption sector with respect to the bearing of the costs of performing the distribution function. Analytically, the cost shifting

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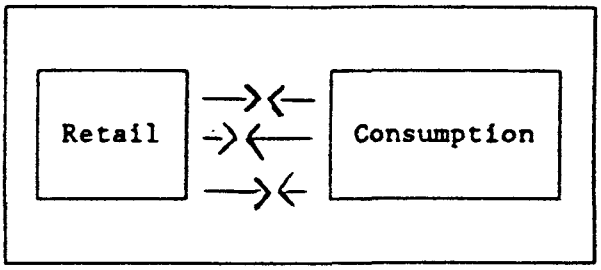
[3]Substantially higher levels of output can be represented as a lengthening of the arrows connecting the retail sector and the consumption sector.

[4]These distribution costs are transportation costs, time costs, storage costs, adjustment costs, information, acquisition and psychic costs. Note that they need not map on a one to one fashion into the distribution services provided by the retailer.

between the retail sector and the consumption sector can be captured by assuming that the distribution services provided by any given retailer play the role of fixed inputs into the purchase activities of consumers. In a household production framework cost minimizing consumers will view increases (decreases) in the levels of distribution services provided by retailers as decreasing (increasing) the costs of attaining any given level of satisfaction, including the optimal level.

Schematically, this second fundamental characteristic of retail markets is depicted in Fig. 5, which is a modification of Fig. 4.

Fig. 5. The Role of Cost Shifting in the Performance of the Distribution Function



Once this possibility is allowed for, a number of different organizational forms become possible in carrying out the distribution function between retailers and consumers.[5] That is, some agents will specialize in providing different combinations, or bundles, of distribution services and items transferred between the two sectors, which is why the connections are depicted with arrows of different lengths in the diagram.

[5]Incidentally, the number of these forms is limited by the existence of jointness in supply in the provision of some distribution services. For instance, increasing the level of information through advertising that includes store hours also increases assurance of product delivery at the desired time.

3. Economic Implications

A rigorous analysis of the implications of this characterization of retail markets for the demand for retail products has been undertaken in Betancourt and Gautschi (1992a). Here, we merely summarize the main results obtained and the most relevant implications. First, by its very nature the household production model generates a strong tendency toward gross complementarity between items in any retail assortment. Second, the role of distribution services as fixed inputs in a household's activities leads to the development of a new concept: the distribution services elasticity of demand. This elasticity brings out a tendency toward gross complementarity between a retailer's distribution service and the items in a retail assortment. Third, this tendency is much stronger for common distribution services than for specific distribution services. The distinction between the two types of services arises in the following manner: common distribution services are those that are available to all items in an assortment; specific distribution services are those that are available to a single item or a subset of items in an assortment. For instance, a retailer that provides greater accessibility of location by having two stores rather than one in a given market area is providing higher levels of a common distribution service to all of the items in the assortments of each store. In contrast, a specific distribution service would be providing information on the price of an item or type of item.

Among the implications of this conceptualization of demand analysis, we want to stress the following. First, both tendencies toward gross complementarities provide economic incentives on the demand side for the emergence of retail agglomerations such as central business districts, shopping centers and shopping malls. Second, distribution services provide the main

instruments for nonprice competition among retailers. Third, and last, these instruments for non-price competition have two special features that must be accounted for in evaluation of their uses in any market setting. First, common distribution services represent rather blunt or unwieldy instruments in that their effects are difficult to predict, because they affect many different items in the assortments of all retailers in different ways. For instance, a firm setting up an additional store in an existing shopping center may attract additional customers to the shopping center who will as a result also patronize competitors already operating in the shopping center. Secondly, these instruments of non-price competition must work through the same demand mechanisms as price competition. Since the tendency toward gross complementarity with respect to price changes limits the extent of price competition, the need to go through the same demand mechanisms also limits the ability to compete effectively through marginal changes in distribution services.

Viewing the retail system in the manner represented in Fig. 5 provides a different perspective on the nature of competition in the retail sector. That is, even if there is horizontal integration among firms that provide similar bundles of items and distribution services, there still will be competition between firms that carry many of the same items and offer a different bundle of distribution services. For instance, the negative effects on competition of horizontal integration by florists are limited by the fact that supermarkets also carry flowers.

A number of economic implications of this view of retailing activities have been drawn in the context of monopolistically competitive market structures. Betancourt and Gautschi (1988) have shown, for example, that the economic characteristics introduced by the existence of distribution services (demand

complementarities and economies of scale and scope in particular) provide profit incentives for retailers to integrate backwards, expand assortments and enter new markets. Similarly, they have also shown that these characteristics can generate long-run equilibria that exhibit price dispersion across market segments as well as product choice with respect to distribution services within market segments. Incidentally, other writers have noted a similar role for distribution services in related contexts. In particular, Perry and Porter (1986), extending the model in Perry and Groff (1985), have analyzed the use of vertical restraints in distribution as an alternative to forward integration due to the nature of distribution services. O. Williamson (1985) observes that "integration into final sales service is mainly observed for consumer and producer durables where considerable knowledge is imparted at point of sale and specialized follow-up service is required...

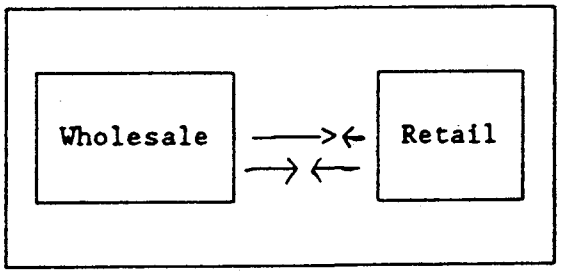
Two other implications of the characteristics of retail systems emphasized here, which are developed in Betancourt and Gautschi (1992b), are worth stressing for subsequent purposes. First, there are significant interactions between the pricing decisions of retailers and the levels of distribution services provided. These interactions take place along several dimensions. Other things equal, there will be an association between offering items at low prices and offering low levels of distribution services. Among the things that may not be equal are distribution services elasticities of demand and economies of scale and scope in the provision of these services. Thus, high elasticities or significant economies will lead to an association between low prices and high levels of distribution services. This is especially true for common distribution services; provision of high levels of specific distribution services, on the other hand, will be normally associated with high prices.

Second, the evaluation of competition in retail markets requires taking into account the role of distribution services. Adopting a framework introduced by Bliss (1988), it is shown that competition in retail markets can but need not be beneficial to consumers in that it will lower retail prices but it may also lower the levels of distribution services provided. On the other hand, when one assumes that prices are given, increased competition always increases welfare by increasing the levels of distribution services.

4. Extensions to Other Subsystems

In the above discussion, the argument has been framed in terms of the retail system. Hence, the question arises as to what extent similar consideration are applicable to the rest of the distribution sector. The answer is that the same considerations apply with minor modifications. To illustrate, we consider the interactions between the wholesale and the retail sector which are again represented schematically in Fig. 6.

Fig. 6. Performance of the Distribution Function Between Wholesalers and Retailers



In Fig. 6, we have two rather than four mechanisms of interactions between the two sectors in order to stress that some of the distribution services that are important in this context may differ from the previous context. Nevertheless, the nature of the interaction as well as most of the relevant distribution

services remain the same. Thus, accessibility of location, assortment, assurance of product delivery and information will perform similar roles; ambiance, however, would be a far less important consideration in this context. Presumably, there will be less asymmetries in the information available to the two sectors in this context. On the other hand, the need for assurance of product delivery at the desired time is likely to be higher. Similar considerations would apply if we were to describe the performance of the distribution function between manufacturers and wholesalers, for example.

From the point of view of the economic characteristics of this subsystem, the behavior of the wholesalers can be described also in terms of a cost minimizing producer that provides explicit items to be transferred to retailers together with a set of distribution services. Once again providing high levels of either set of outputs raises costs for the agents that provide them. Moreover, different institutional forms can arise as a result of agents specializing in offering different bundles of distribution services and items to be transferred between sectors. For instance, one such institutional form in the wholesale sector identified in the U.S. Census are brokers, who differ from merchant wholesalers in that they do not acquire ownership in the items transferred. Brokers are thus intermediaries that perform the wholesale function providing zero levels of the distribution service implied by acquiring full ownership rights.[6]

In their behavior with respect to the wholesale sector, the retail sector can be viewed as operating a set of purchase activities in which the distribution

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[6]In a recent paper Lin (1991) establishes that consignment equilibria can improve efficiency (greater producer plus retailer profits plus consumer surplus). His results imply that brokers perform their function in a perfectly competitive setting or that producers perform the function at cost.

services of the wholesalers play the role of fixed inputs (since these services are not explicitly priced but their costs are covered in the wholesale prices of the items to be transferred). Hence, possibilities for cost shifting between wholesalers and retailers arise in the bearing of the costs of performing this aspect of the distribution function. In a profit maximizing framework, cost minimizing retailers will view increases (decreases) in the levels of distribution services provided by wholesalers as decreasing (increasing) the costs attaining any given levels of outputs desired by the retailers (including the profit maximizing levels). While this formulation of the problem has not been analyzed in detail in the literature, the similarities in the operation of this subsector with the retail consumption subsector previously analyzed are somewhat transparent. That is, demand complementarities in the operation of the retail sector and economies of scale and scope in the operation of the wholesale sector will play a critical role in determining the institutional forms that emerge to perform this aspect of the distribution function.

In the previous paragraphs the similarities between the interactions of the wholesale/retail subsector and the retail/consumption subsector have been emphasized. The same considerations apply to the interactions between the production/wholesale sector or the production/retail sector but they will not be discussed here to avoid repetition.

5. Sources of Differences in Distribution Systems

There will be two main sources of differences in the interactions between subsystems of the distribution sector. One source will be the internal characteristics of each component—what is inside the square boxes in each figure; the other source will be the external environment in which the components interact—namely, market structures, legal systems, and informal constraints.

The first source is most easily seen by looking at the consumption sector. There is great geographical dispersion of the agents within the consumption sector; they have more limited access to information and technology as a result of their size. They have a low level of asset specificity in any transaction with the other sectors. Finally, as end users they determine the ultimate success or failure of any particular arrangement in the performance of the distribution function. The other components differ substantially in all these dimensions. They also differ in other dimensions, of course. For instance, the number of transactions required in order to perform the wholesale function can differ from what is required to perform the retail function. An interesting example of this difference is the multilayered structure of the wholesale sector in Japan, e.g. Maruyama (1991).

When we look at the external environment in which the sectors interact, the most striking differences arise in the interactions between the retail sector and the consumption sector vis-a-vis any of the other subsectors. The mobility of consumers in modern economies as well as their geographical dispersion tends to favor competition in retail markets and leads to frequent characterizations of these markets as either monopolistically competitive or competitive. By contrast, in the interactions between other subsectors one can find many variants of market structures interacting with each other. One important consequence of this difference is that issues of vertical integration arise prominently in these interactions.

One view of vertical integration is as giving one party unified interests and complete control over all aspects of combined operations. Perry (1988) associates this position with the neoclassical view. He goes on to point out, however, that Grossman and Hart (1986) argue that vertical integration is the

ownership and thus complete control over assets, regardless of the relationship with labor. On the other hand, Williamson (1975) emphasizes the relationship with labor in defining vertical integration, noting that capital equipment can be owned or leased without affecting the degree of vertical integration. Finally, an important set of issues arises in the existence of business practices for interactions between those subsectors that are known as vertical control or restraints. Katz (1988) takes the view that sophisticated pricing and vertical restraints are responses to problems of moral hazard, adverse selection and the need to share risk. Since vertical integration of operations in the neoclassical sense does not necessarily eliminate these problems, it may not be useful to view the use of these constraints as an intermediate position between vertical integration and spot exchange.

From our perspective the above discussion merely identifies the range of interactions that can take place between the subsectors that perform the distribution function. To complete the discussion, we note the main forms of contractual interactions or business practices identified by Katz as characterizing the sales of intermediate goods. These practices are thus relevant for understanding the interactions between the subsectors that perform the distribution function. They are: quantity dependent pricing, ties, royalties, requirements contracts and exclusive dealing, resale customer restraints, and resale price restraints.

These institutional forms develop in the context of a legal system. At the same time, our understanding of the determinants of these forms leads to modifications of their legal standing. Three general types of determinants of vertical integration are identified by Perry (1988): technological economies, transactional economies, and market imperfections. The legal standing of a

particular vertical integration scheme will be affected by which of these factors is viewed as its main determinant. Similar considerations apply to the legal standing of various business practices. As Katz (1988) points out, there are two sources of difference between social incentives and private agents' contract design incentives: namely, the effects of a practice on consumer surplus and the effect of the practice on industry profits. Antitrust provisions with respect to these practices is made difficult by the lack of proper benchmarks to evaluate their effects. Finally, broader legal restrictions on opening hours, zoning codes, etc., will also affect the performance of the distribution function by any subsector.

To conclude, it should be noted that the availability of infrastructure and technology is also a significant determinant of the internal characteristics of each component subsector as well as of the external environment in which they interact. Thus, a source of differences in distribution systems.

III. Size, Structure and Operations: An Overview of the U.S. Distribution System

1. Size

In 1969 the gross domestic product of the wholesale and retail sector was 361.7 billions of constant 1982 dollars. By 1988, this sector's contribution to gross domestic product in 1982 dollars was 693.9 billion. Thus, in 1969 the wholesale and retail trade accounted for 15.3 percent of gross domestic product, whereas in 1988 it accounted for 17.5 percent of GDP, i.e., a significant increase in the sector's share of GDP during this twenty year period. Indeed, throughout the whole period it ranked second only to manufacturing in its contribution to GDP and ahead of other sectors such as agriculture, mining, construction, transportation and public utilities, finance, insurance and real

estate, services and government enterprises.[7] In this twenty year period, the distribution sector had an average yearly growth rate of 1.1 percent for 1968-1976 and of 2.4 percent for 1977-1988.[8]

One of the functions of the distribution sector is to provide storage both for the consumption sector and the manufacturing sector, i.e. assurance of product delivery. The importance of this distribution service can be seen in the size of inventories held by this sector. In 1969 the wholesale sector held inventories worth 98.9 billion of 1982 dollars and the retail sector held 96.4 billion of 1982 dollars worth of inventories. Their sum (195.3) came close to the 248.5 billion of 1982 dollars held in inventories by the manufacturing sector. By 1988, wholesale inventories were worth 192.4 billion of 1982 dollars and retail inventories were worth the same amount. The total 384.8 billion exceeded the value of inventories held by manufacturing that year, i.e. 329.8 billion of 1982 dollars.[9] Additional evidence can be gathered from the inventory to sales ratio.[10] In 1969 these ratios were 1.84, 1.27 and 1.44 for manufacturing, wholesale and retail, respectively. By 1989, these ratios had become 1.58, 1.27 and 1.59, respectively. These changes suggest a shift in inventory holding from the manufacturing sector to the distribution sector, improvement in inventory management by the manufacturing sector, and a higher level of this distribution service provided to the consumption sector.

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[7]Base figures for these statements are taken from the Economic Report of the President (1991), Table B-11.

[8]The methodology was changed in 1977; hence, we split the sample in calculating the average rate of growth.

[9]These figures are from Table B-19 of the Economic Report of the President 1991. They refer to the value of inventories at the end of the last quarter of the year.

[10]These figures are from Table B-55 of the Economic Report, 1991.

Another dimension of the performance of the distribution function lies in the employment generated by this sector. In 1968, the number of employees on payrolls in the manufacturing sector was 19,781 thousands of persons. The distribution sector in that year had 14,704 thousands of employees, of which 3,915 thousands were in wholesale and 10,785 thousands were in retail. By 1988, manufacturing employment had decreased slightly to 19,350 thousands of employees while the distribution sector had grown to 25,132 thousands of employees, of which 6,271 thousands were in the wholesale sector and 19,077 thousands were in the retail sector.[11] In 1968, the distribution sector accounted for about 21.6 percent of those employees on nonagricultural payrolls; by 1988, it accounted for 23.7 percent. Another aspect of employment, however, is compensation. In 1968, average weekly earnings of nonsupervisory workers in manufacturing were $122.51 whereas in the retail sector these earnings were $74.93. By 1988, these numbers had become $430.09 for manufacturing and $188.72 for the retail sector.[12] Thus, the ratio of earnings in the two sectors went from 1.63 in 1968 to 2.27 in 1988.[13] These trends reflect both the increasing demand for the services of the distribution sector as well as the disparity in the increase in labor productivity in manufacturing and retailing. Finally, during the same period the ratio of corporate profits in manufacturing to corporate profits in the

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[11]These data are from Table B-43 of the Economic Report of the President, 1991. The figures include full and part-time wage and salary workers who received pay for any part of the period which includes the 12th of the month.

[12]These data are taken from Table B-44 in the previously cited report.

[13]If we look at fulltime workers only, it is possible to obtain a breakdown for 1988 that includes the wholesale trade (from the Handbook of Labor Statistics). The ratio of weekly earnings of fulltime workers in manufacturing to wholesale and retail were 1.013 and 1.473, respectively. This reveals a greater use of part time workers in retailing.

distribution sector went from 3.98 in 1968 to 2.87 in 1988.[14] This is another manifestation of the increasing importance of the distribution sector in the economy as well as of changes in the ownership structure of this sector from unincorporated enterprises to corporate forms.

In order to gain some perspective on the structure and operations of the distribution sector, we will consider selected statistics from the 1987 Census. For expositional purposes, it is convenient to consider separately the wholesale sector and the retail sector.

2. The Wholesale Sector

A. Structure

Table 1 contains several statistics that reflect the structure of this sector in 1987. The durable goods sector dominates the statistics in that it provides more than 50 percent of the establishments and employees of the sector. At the same time, it is the sector exhibiting the greatest concentration of sales among the four largest firms while it has the lowest capital intensity. The food subsector is notable in that it contains about 9 percent of the establishments and 13 percent of the employees in the wholesale sector. It also has a much higher level of concentration than other subsectors in the nondurable goods category.

The number of establishments or the density of establishments can be viewed as indexes of the level of accessibility of location provided by the wholesale sector to both the production sector and the retail sector. The former index is an absolute indicator; the latter index is a relative indicator useful for cross-country or intertemporal comparisons. Similarly, the number of employees or the

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[14]These data are from Table B-88 in the previously cited report.

number of employees per establishment can be viewed as indexes of the levels of specific distribution services provided by the wholesale sector to the production and retail sector. Once again the relative indicator is the most useful one for cross-country or intertemporal comparisons. Interestingly, the nondurables sector provides higher levels of specific distribution services and lower levels of accessibility of location than the durables sector. This characteristic is even more accentuated for the food sector.

Table 1 Structure of Wholesale Sector in U S , 1987

	# of Establishments[1]	# of Employees[2]	Employees per Establishment[3]	Capital Intensity[4]	Concentration Ratios[5]	Density[6]
Total	469,539	5,596,024	11 9	30,678	6 3	1 93
Durables	297,292	3,331,780	11 2	26,019	12.4	1.22
Nondurables	172,247	2,264,244	13.1	37,829	4 4	71
Food	42,075	762,513	18 1	31,158	7 9	.17

[1]Taken from WC87-S-1, Table 1

[2]Taken from WC87-S-4, Table 7.

[3]Column 2/Column 1.

[4]Obtained as the ratio of acquisition value of depreciable assets for merchant wholesalers at end of 1987 from WC87-S-2, Table 1 to number of paid employees of merchant wholesalers per pay period including March 12, from Table 7 in WC87-S-4 The dimension is 1987 $ per employee

[5]Percentage of sales of four largest firms to all sales, taken from Table 8 in WC87-S-2.

[6]# of establishments per 1,000 residents.

One measure of the extent of vertical integration in this sector is the extent to which manufacturer's sales branches and offices sell directly to retailers. Hence, in Table 2 we provide some evidence on this issue. Manufacturer's sales constitute 31 percent of the wholesale trade. This percentage is slightly higher for durables than it is for nondurables and it is significantly lower for the food sector, i.e. groceries and related products.

Of these sales by manufacturers 40 percent go directly to the retail sector and 23.2 percent to the wholesale sector. The rest goes mainly to industrial users and commercial and professional users. In the durables sector a much higher proportion goes to retailers than wholesalers, and in the nondurables sector they are about evenly divided. Not surprisingly, in the food sector about 92 percent of sales are to either retailers or wholesalers. A noteworthy characteristic, not represented in the table, is that manufacturer's establishments represent only 7.7 percent of the total number of establishments in the wholesale sector. Indirect evidence on horizontal linkages is provided by the percentage of sales

Table 2. Extent of Vertical Integration by Manufacturers, U.S. 1987.[0]

	Percent of Total Sales[1]	Percent of Sales to Retailers[2]	Percent of Sales to Wholesalers[3]
Total	31.0	40.0	23.2
Durables	32.8	44.0	14.6
Nondurables	29.1	34.7	33.8
Food	23.4	50.8	40.9

[0]All figures based on Table 1 of WC87-S-4.

[1]Ratio of sales by manufacturer's branches and offices to total sales of wholesale sector in percentage terms.

[2]Sales by manufacturer's branches and offices to retailers divided by total sales of manufacturer's branches and offices in percentage terms.

[3]Sales by manufacturer's branches and offices to wholesalers divided by total sales of manufacturer's branches.

of single unit firms relative to the sales of multiunit firms. The percentage for the wholesale trade as a whole is 44.8 percent. The corresponding numbers for durables and nondurables are 43.4 percent and 46.3 percent, respectively. The food sector exhibits a higher percentage (58.9) of sales by single establishment firms relative to multiples.

B. Operations

Selected statistics on the operations of the wholesale sector are presented in Table 3. All statistics refer to merchant wholesalers, with the exception of exit rates which refer to the wholesale sector as a whole. The first column gives an indication of profit margins in the wholesale trade, i.e. the ratio of operating income to sales. These margins are larger for durables than nondurables and below the average for nondurables in the food trade. This may be the result of competition from vertically integrated structures, i.e., food manufacturers who integrate forward by selling directly to retailers and supermarket chains that integrate backward into manufacturing by fabricating their own brands. Some evidence on the former is given in Table 2, which shows that sales by manufacturers are 23.4 percent of total sales in the food wholesale sector and over half of these sales go directly to retailers. The sales of the wholesale sector are about evenly divided between durables and nondurables. The food sector contributes 15 percent of all sales of the wholesale sector.

Labor productivity, measured as sales per employee, is higher for durables than nondurables and slightly below the average for nondurables in the food sector, perhaps reflecting the greater need to employ labor in the handling of perishables. Sales per wholesale establishment are much higher for nondurables than durables and this phenomenon is even more marked in the food trade, where sales per wholesale establishment are twice the level of the durable trade. In turn, this is reflected in gross margins as a percentage of sales which move in inverse order with sales per establishment. Not surprisingly, the ratio of inventory to sales for durables is twice the ratio for nondurables and almost five times the ratio for the food sector. Merchant wholesale importers, i.e., establishments buying on their own account and whose principal source of purchase

Table 3 Operations of Merchant Wholesalers, U S 1987

	Net Margin[1]	Sales[2]	Sales/Emp [3]	Sales/Est [4]	Gross Margin[5]	Inv /Sales[6]	Import/Sales[7]	Exit Rates[8]	Turnover Rate[9]
Total	4 1	1,491	330	3 781	20 1	11 1	15 2	5 6	10 5
Durables	4 7	728	274	2 977	23 6	14 5	22 1	5 5	10 2
Nondurables	3.5	763	416	5 206	16 9	7.8	8 2	8 0	10 9
Food	3 1	223	385	6,869	15 2	3 1	6.4	6.2	14 5

[1](Gross margin - operating expenses)/Sales from WC87-S2, Tables 6 and 11, in percentage terms.

[2]Sales in billions of 1987 dollars from WC87-S2 Table 6

[3]Sales/Employees which are both taken from WC87-S4, Table 7. The numbers represent millions of 1987 dollars of sales per employee

[4]Sales/Establishment which are both taken from WC87-S4, Table 7. The numbers represent millions of 1987 dollars per establishment

[5]Gross margins as percentage of sales taken from Table 13 in WC87-S2 except for the food sector, which is calculated from Table 11 in WC87-S2

[6]Inventories at end of 1987/sales for 1987 both taken from WC87-S2, Table 1 (in percentage terms)

[7]Sales of importer merchant wholesalers/Sales of merchant wholesalers both figures taken from WC87-S4, Table 7 (in percentage terms)

[8]Establishments in operation anytime during the year - Establishments in operation at the end of the year/Establishments in operation anytime during the year From Table 6-1, WC87-S1 These numbers refer to all wholesalers rather than just merchant wholesalers (in percentage terms).

[9]Firms not operated entire year/All firms, both taken from WC87-S1, Table 7 (in percentage terms)

was foreign, account for almost 15 percent of total sales of merchant wholesalers. This phenomenon is far more pronounced in the durables trade, where they account for 22.1 percent of durables sales, than in the nondurable trade, where they account for 8.2 percent. In the food sector, importers account for an even lower percentage of sales. There are sizable exit rates for establishments in this sector. This process is more pronounced for nondurables than for durables and it is below the average for nondurables in the food sector. Turnover rates for firms are also sizable, indicating a vigorous process of entry and exit in merchant wholesaling within the year. This process is most pronounced in the food sector.

3. The Retail Sector

A. Structure

In Table 4 we present selected statistics that reflect the structure of this sector. The nondurable goods sector dominates the statistics in that it provides over two thirds of the establishments and employees of the retail sector. The food sector contributes slightly less than 20 percent of the establishments and slightly more than 20 percent of the employees of that nondurable subsector. Capital intensity is higher in the nondurables sector and within this sector food has an above average level of capital intensity. It is noteworthy, however, that the retail sector exhibits considerably lower levels of capital intensity than the wholesale sector. Incidentally, concentration ratios cannot be calculated for the aggregates from the published tables. The only one directly available is the one for the food sector, namely 16.5 percent.

If we view employees per establishment as an index of the provision of specific distribution services to the upstream and downstream sector, it is interesting that in two cases the wholesale sector provides higher levels of these services to the production and retail sector than the retail sector provides to the wholesale and consumption sector. That is the case for durables and for the food sector. The only exception is the nondurables sector. In contrast the density of establishments reveals that the retail sector provides considerably higher levels of accessibility of location than the wholesale sector in all cases. The differences are especially pronounced for nondurables, including the food sector. In the food sector this is not surprising in light of the greater frequency of purchases associated with food products.

Table 4 Structure of U.S. Retail Sector in 1987

	# of Establishments[1]	# of Employees[2]	Employees per Establishment[3]	Capital Intensity[4]	Density[5]
Total	1,503,593	17,987,540	12.0	14,346	6.19
Durables	453,342	3,631,254	8.0	15,270	1.87
Nondurables	1,050,251	14,356,286	13.7	14,112	4 33
Food	190,706	2,854,673	15.0	16,406	.79

[1]Constructed from addition of sectors classified as durables and nondurables in RC87-A52 (Geographic Area Series, United States), Table 3

[2]Constructed from addition of sectors classified as durables and nondurables in RC87-A52 (Geographic Area Series, United States), Table 3.

[3]Column 2/Column 1

[4]Obtained as the ratio of acquisition value of depreciable assets at end of 1987 from RC87, I-2, Table 2, to number of paid employees per period including March 12, from column 2 The dimension is 1987 $ per employee.

[5]# of establishments per 1,000 residents

The degree of internal vertical integration in retailing is not available in a systematic manner, perhaps because its most important component is the use of private labels by retailers. Nevertheless, some measures of external vertical integration through franchising are available in the Statistical Abstract of the United States, 1991 (Tables 1368-1370). From 1970 to 1988, the number of domestic franchised establishments went from 396,000 to 481,000. Of these franchised establishments company owned ones were 22.2 percent of those owned by franchisees in 1970; in 1990, however, company owned establishments were 24.3 percent of those owned by franchisees. The overall importance of this phenomenon can be illustrated by noting that sales by all franchised establishments accounted for slightly over one third of total retail sales in 1987.[15] Interestingly, company owned establishments accounted for a much lower proportion of sales than of establishments, e.g., in 1988 sales by company owned

[15]Incidentally, franchised establishments includes those other than in the retail trade.

establishments were 17.8 percent of sales by franchisee owned establishments. Finally, in 1970 U.S. companies operated 156 franchised foreign outlets while there were 3,400 foreign outlets in the U.S.; by 1988 U.S. companies were operating 354 franchise outlets outside the U.S. while foreign companies were operating 35,000 franchise outlets in the U.S.

An idea of the incidence of this phenomenon on the retail trade proper can be obtained by noting the per cent of all franchise sales contributed by franchisees in selected retail subsectors during 1987: auto and truck dealers, 53 3 percent; restaurants, 9.5 percent; gasoline service stations, 14.9 percent; nonfood retailing, 4.2 percent. Clearly, this phenomenon is especially significant in the retailing of automobiles and of gasoline. To reinforce this point, we note that out of 27,400 establishments selling new and used cars in the U.S. in 1988 25,150 were estimated to be franchises; total sales of gasoline service stations in 1988 were 107.9 billions of dollars and sales by franchises were estimated at 101.9 billions of dollars.

Indirect evidence on the extent of horizontal integration in the retail trade is provided by the ratio of sales of single unit firms to the sales of firms with multiple units. For instance, in 1987 the ratio for the retail trade as a whole was 77.0 percent. In the food trade, however, this ratio was 33.0 percent, which reveals a much higher level of horizontal integration in this category.

B. Operations

Selected statistics on the operations of the U.S. retail sector are presented in Table 5. Profit margins in retailing are higher for durables than for nondurables and are especially low in the food trade. The nondurable goods sector dominated retailing in terms of sales, accounting for over 60 percent of

sales. The food sector accounts for about 20 percent of total retail sales. Labor productivity (sales per employee) is highest in the durable goods sector, but among nondurables the food sector is remarkable for having much higher levels of labor productivity than other nondurable sectors. Part of the greater productivity of the durables sector may be due to its providing considerably lower levels of specific distribution services, as measured by employees per establishments in Table 4.

If sales per establishment are an indicator of scale economies, those economies are being realized more intensely in the durables sector than in the nondurables sector. Once again, the food sector is a notable exception in that

Table 5. Operations of U S Retail Sector, 1987

	Net Margin[1]	Sales[2]	Sales/Emp [3]	Sales/Est.[4]	Gross Margin[5]	Inv /Sales[6]	Exit Rates[7]
Total	4.2	1 494	084	994	32.3	13.1	8 4
Durables	4 9	.552	152	1 218	27 4	18.2	7 2
Nondurables	3 7	.942	.066	897	35 1	10.1	8 9
Food	2 4	302	106	1 580	25.6	6.6	9.2

[1](Gross margin - Operating expenses)/Sales, from RC87-S2, Tables 6 and 11.

[2]Sales in billions of 1987 dollars from RC87-S2, Table 6

[3]Sales/Employees. The numerator taken from RC87, Table 6, and the denominator from Table 4, Column 2, above.

[4]Sales/Establishment The numerator is taken from RC87, Table 6, and the denominator is taken from Table 4, Column 1, above

[5]Gross margins as a percentage of sales taken from RC87-S2, Table 13, for the first three rows and calculated from Table 11 for the food category

[6]Inventories at end of 1987/Sales for 1987 Both taken from RC87-S2, Table 1 (in percentage terms)

[7](Establishments in operation anytime during 1987 - Establishments in operation at end of 1987)/Establishments in operation anytime during 1987. Both taken from RC87-S3, Appendix G

it operates at a much higher level of sales per establishment than even the durable goods sector. Perhaps as a consequence gross margins are lower for durables than for nondurables and they are lowest, of course, for the food sector. The ratio of inventories to sales is almost twice for durables than for

nondurables and exit rates of establishments are higher for nondurables than durables and highest in the food trade. This is quite consistent with the behavior of profit rates in column 1.

4. Comparability Issues

Since this study is part of a larger one that involves cross-country comparisons, it is useful to conclude this overview by addressing several issues of comparability that arise in using the previous figures. First, consider the measurement of density of outlets. This statistic has been reported in terms of population but one could have chosen just as well the area of a country. This would make little difference for comparisons within a country but it would lead to significant differences in intercountry comparisons. For instance, differences in density between Japan and the U.S. would be greatly magnified by the choice of this alternative denominator. Conclusions based on one index that are reversed using the other should be treated with circumspection. In general the ability of the U.S. system to distribute goods using few establishments would be magnified with this alternative denominator.

A second issue that arises is the index to use in productivity comparisons across countries. Economists have long favored the use of total factor productivity over labor productivity on a conceptual basis. Nevertheless, estimates of total factor productivity require a large number of assumptions and the comparability of estimates done by different investigators even for the same country generates numerous controversies, e.g., Ofer's (1987) discussion of the growth experience in the former Soviet Union. Not surprisingly, in areas of controversy such as in explaining the U.S. productivity slowdown investigators often focus on the analysis of output per man hour or labor productivity, e.g. Williamson's (1991) review of the effort by Baumol, Blackman and Wolff (1990),

since there is much less massaging of the basic numbers.

In using the labor productivity figures presented here in international comparisons, there is one factor that must be kept in mind for international comparisons: namely, the use of employees rather than man hours in the denominator underestimates labor productivity in the U.S., especially in retailing. As indicated in our discussion of size, there seems to be indirect evidence of substantial part-time employment in the distribution sector, especially in retailing. While direct evidence is not easily available, some information useful for correcting estimates for international comparisons is provided in Table A1 of the Appendix. The information in the table reveals a much shorter workweek in 1987 for workers in retailing than in either manufacturing or wholesaling. The ratio of average weekly hours of manufacturing workers to those of workers in wholesaling and retailing in 1987 was 1.076 and 1.404, respectively. Thus, our figures may underestimate labor productivity by 40 percent relative to an environment where only full time employees are used.

While other issues have been alluded to before, at least indirectly, it is worth mentioning them explicitly here: 31 percent of the sales of the wholesale sector are direct sales by manufacturers' sales branches and offices, 10 percent are sales by agents, brokers and commission merchants and the remaining 59 percent are sales by merchant wholesalers. The second category is much less important in some other countries, for example Japan. In any event, the figures on operations are only available for merchant wholesalers.

With respect to the retail sector there are two other issues that need to be considered in international comparisons. One is that it contains a much lower proportion of self-employed than would be the case for other countries. All of the figures presented in the text are for establishments with payrolls. An

estimate of the importance of self-employment in the U.S. can be obtained, however, by considering the percentage of sales and establishments made up by establishments without payrolls, which is the only information available in the Census. The contribution of establishments without payrolls to total sales is relatively small, 3 percent. The contribution to total number of establishments is more substantial, 37.9 percent.

Finally, the U.S. classification system includes eating and drinking establishments as part of the retail sector. This practice is at variance with that of most industrialized countries. Therefore, Tables A2 and A3 of the Appendix provide the same information on the structure and operations of the U.S. retail sector as in the previous two sections excluding eating and drinking establishments. Obviously, absolute levels in Tables 4 and 5 decrease as a result of excluding this sector. More interestingly, capital intensity increases in the nondurables sector and it is higher for the sector as a whole than for the food subsector. Density, of course, decreases in the affected categories and employees per establishment decrease but the relative rankings remain the same. With respect to operations, net margins remain the same. Sales per establishment and per employee as well as the inventory to sales ratio increase but rankings of subsectors remain the same. Gross margins and exit rates decrease but once again rankings remain the same.

IV. Important Factors in the Functioning of the U.S. Distribution System

1 Vertical Integration

One of the characteristics of distribution systems noted in Section II is that in the performance of the distribution function different institutional forms appear in any society. In this subsection, we discuss in greater detail

those forms associated with some aspect of vertical integration. The data in Section III.2. suggests that there is substantial forward vertical integration by manufacturers in the form of internalizing the wholesale function by selling directly to retailers. That is, 12.4 percent of total sales in wholesaling are the result of this particular form of vertical integration by manufacturer's sales branches and offices. This process is most pronounced in the durables sector, where direct sales to retailers by manufacturers are 14.4 percent of total sales.

Given the quantitative importance of this phenomenon, it is useful to identify the specific categories in which the process of vertical integration through internalization of the wholesale function is most pronounced. The three SIC categories of durable goods with the highest proportion of direct sales by manufacturers to retailers and repair shops are: automobiles and other motor vehicles (5012), 95.5 percent of sales; electrical appliances, radios and television sets (5064), 70.9 percent of sales; and toys and hobby goods and supplies (5092), 95.6 percent of sales. The first two categories are notable because they satisfy Williamson's characterization of the desirability of integration into final sales and services for consumer and producer's durables where considerable knowledge is imparted at point of sale and follow-up service is required. Of course, these figures indicate the internalization of the wholesale function and Williamson's argument implies the need for exercising control over the retail function as well. In the automobile industry this control at the retail level is exercised via external integration through franchising. That is, the figures presented earlier indicate that 91.7 percent of all establishments selling new and used cars are franchises. No direct evidence on franchises in the electrical appliances industry is available but one

surmises that either franchises or some of the other forms of vertical controls would prevail in the retailing of these goods. To complete the picture, however, it must be noted that over 50 percent of wholesale sales in the auto category are by manufacturers, whereas in the other two sectors manufacturer's sales are less than one third of the wholesale sales of the category.

Vertical integration through internalization of the wholesale function also takes place in the nondurables sector. The four categories with over 80 percent of sales by manufacturers going directly to retailers are: men's and boy's clothing (5736), women's, children's and infant's clothing (5137), footwear (5139), and beer and ale (5181). Nevertheless, in all of these categories over 60 percent of wholesale sales are by merchant wholesalers or agents, brokers, and commission merchants. This suggests that there are reasons for internalizing the wholesale operation other than those emphasized by Williamson in the case of durables. For instance, the ability to acquire instantaneous information on the characteristics of demand made famous by the Benetton example.

Another aspect of vertical integration in the distribution sector is the phenomenon known as private labels. Originally, these labels referred to the trademark of a distributor which was not emphasized or made visible. In the last thirty years, distributors have made these brands more visible and often support them in competition with national brands. As Fitzell (1982) argues, "Retailers and wholesalers have modernized their label packaging and consolidated their label names and now are moving aggressively into advertising and merchandizing private labels." The business relationships associated with private labels, however, take many forms and, thus, are difficult to categorize and measure. One possible form is through backward integration of wholesalers or retailers into manufacturing. Indirect evidence of this phenomenon for wholesalers is available

in terms of the percentage of employees employed in manufacturing. This number is 3.8 percent for the entire wholesale trade.

Of course, several other forms of business relationships are prevalent and would not be captured by these numbers. For instance, the distributor may enter into long term relationships with suppliers and have the private label products manufactured and packaged to certain specifications. The suppliers can range from independent manufacturers to manufacturers of national brands to wholesalers or even importers. In some arrangements private label brands are sold to others under licensing agreements and they may even be exported. At some point in this process, of course, the private label may become a regional or national brand. A 1979 marketing study reported by Fitzell (p. 92) indicates that private label penetration is strongest in the following product lines: interior wall paint (43.7), car batteries (42.6), frozen orange juice (41.4), exterior housepaint (41 1) and vitamin tablets (39.8). In his listing of the leading organizations providing private label products, Fitzell (p. 255-264) has: 28 supermarket chains; 22 wholesale grocers; 6 retail distributors; and 10 food service distributor groups.

While horizontal and vertical integration are conceptually separate, in practice firms with multiple units and especially chains are more likely to engage in various forms of vertical integration. For instance, as noted in the previous paragraph supermarket chains are important in providing private labels. Therefore, we provide here some statistics from the 1987 Census on the percentage of sales of the wholesale sector controlled by "chains." The latter will be defined as multi-unit firms with more than 10 outlets. These 'chains' control 44.4 percent of sales of the wholesale sector. In durables they control 44.7 percent of sales whereas in nondurables they control 39.8 percent of sales. In

the food sector they control 32.3 percent of sales. In the retail sector as a whole "chains" defined in the same manner account for 42.1 percent of sales and in the food subcategory they represent 62.1 percent.[16]

2. Performance Measures

A critical variable in the performance of the distribution function is gross margins. For instance, some writers have argued that it should be viewed as the price of distribution, e.g., Bode (1990). Indeed, this underlies the use of mark-up models, e.g., Nooteboom, Kleijweg and Thurik (1988), to explain retail margins. The discussion in Section II, however, allows a more direct and richer interpretation of gross margins. Definitionally, the gross margins can be characterized as the sum of two components: the ratio of profits to sales and the ratio of the costs of distribution to sales. Introducing some notation we have:

$$(S - CG)/S = \pi/S + C/S \qquad (1)$$

where S is sales, CG is the cost of goods sold, π is profits and C represents the costs of distribution.

If we look at the information in Table 3 and Table 5, column (1) or net margins are an estimate of the first component of the right hand side of equation (1) and column (5) is an estimate of the left hand side of equation (1). Of course, their difference is an estimate of the second term on the right hand side of equation (1). We present this difference in Table 6. The first thing to notice in a comparison of the wholesale and the retail sector is that net margins are very similar between both sectors. The only sector where there appears to

[16]The information for the retail sector is also from the 1987 Census.

be a significant difference in net margins is the food sector, in which retailers operate with a substantially lower ratio of profits to sales than wholesalers. In contrast, there appear to be substantial differences between wholesalers and retailers with respect to gross margins and consequently with respect to distribution costs. Whether one looks at gross margins or at the ratio of distribution costs to sales, one finds substantially higher ratios in the retail sector than in the wholesale sector. Secondly, while the range of variations in

Table 6. The Costs of Distribution in U.S., 1987

	Wholesale	Retail[1]	Retail[2]
Total	16.0	28.1	24.8
Durables	20.9	22.5	22.5
Nondurables	13.4	31.4	26.8
Food	12.1	23.2	23.2

[1]Including eating and drinking establishments.
[2]Excluding eating and drinking establishments.

net margins is small in both sectors the range of variations in gross margins or in the ratio of distribution costs to sales is large in both retailing and wholesaling. These statements hold whether or not eating and drinking establishments are included.

A. Net Margins

How do we explain the similarities in net margins in wholesale and retail? Similarities in net margins would be expected from the general nature of the competitive process. If these ratios were very different, one would expect the process of entry and exit to narrow it down. Indeed, exit rates are higher for nondurables in both wholesale and retail sectors and nondurables have a lower net

margin. The turnover rates of firms can be viewed as a measure of turbulence in the market and this rate is lower for durables in the wholesale sector as one would expect, given its higher net margin. Finally, the differences in net margins while small in magnitude may be important from an economic point of view. Thus, it may be no accident that net margins are higher for durables and so are concentration ratios.

There is considerable controversy in the use of accounting profits as a measure of economic profits. Indeed, a recent contribution to the subject, Davis and Kay (1990), argues in favor of a new measure "added value" which in principle aims at measuring what economists refer to as above normal profits. In practice, this is accomplished by assigning a somewhat arbitrary return to the capital stock in order to arrive at the empirical construct. Such a procedure would be subject to greater problems in the analysis of the distribution sector as we shall now illustrate. Suppose one calculates an alternative profit rate based on the capital stock used in the sector. These "profit rates" are presented in Table 7. They are based on dividing operating income by the assets of the sector. The table reproduces the net margins for comparison.

Table 7: Profit Rates in Distribution

	Wholesale		Retail		
	Net Margin[1]	Profit Rate[2]	Net Margin[3]	Profit Rate A[4]	Profit Rate B[5]
Total	4.1	44.3	4.2	24 2	28 7
Durables	4.7	48.8	4 9	49.1	49 1
Nondurables	3 5	40 1	3.7	17 4	20 8
Food	3 1	39.6	2.4	15 7	15 7

[1]Taken from Table 3
[2]Ratio of (Gross Margin-Operating Expenses)/Acquisition Value of Depreciable Assets at end of 1987 Both taken from WC87-S-2 The ratio is expressed in percentage terms
[3]From Table 5
[4]Ratio of (Gross Margins-Operating Expenses)/Acquisition Value of Depreciable Assets at end of 1987 Both taken from RC87-S-2 The ratio is expressed in percentage terms
[5]Same as in 4 but excluding eating and drinking establishments.

The rankings of subsectors remain the same when measured by this alternative 'profit rate', but the absolute levels are magnified by factors of 5 to 10. There are two reasons for these absolute differences. One is the low level of capital relative to sales in the distribution sector, after all these profit rates are equal to the net margin x sales/capital. The second reason is that in the Census these measures of capital are valued at original cost, and do not include intangible assets such as good will or the value of land or depletable assets. To conclude, the usual profit rates or net margins used in the distribution literature seem more useful than the feasible alternatives.

B. Gross Margins

How are the differences in gross margins to be explained? An explanation must rely on the differences in distribution services provided by the retail and the wholesale sector. Some evidence can be gathered by juxtaposing the data in Section III with the considerations presented in the previous section. The ratio of inventory to sales can be used as a direct indicator of assurance of product delivery. This ratio is 13.1 in retailing and 11.1 in wholesaling. The number of employees can be used as an indicator of the provision of specific information services. This number is about 5.6 million in wholesaling and about 18 million in retailing. Similarly, the number of establishments can be used as an indirect indicator of the provision of accessibility of location. This number is about 470 thousand for wholesale and 1.5 million for retail.[17] Hence, all three indicators suggest that the retail sector provides considerably higher levels of distribution services to its customers than the wholesale sector. Thus, it is not surprising that it operates with higher gross margins and higher ratios of

[17]Note that sales are about the same in wholesaling and retailing.

cost of distribution services to sales than the wholesale sector.

Additional evidence on the role of distribution services in explaining retail margins is available from a study of the U.S. retail sector by Betancourt and Gautschi (1992c). The view of distribution services as outputs of retail activities leads to the interpretation of the numerator on the second term of the RHS of (1) as a cost function in which distribution services play the role of outputs; similarly, the view of distribution services as fixed inputs into the purchasing activities of consumers leads to the interpretation of the denominator in terms of a demand function where distribution services increase the demand for explicit outputs or the price the consumer is willing to pay for these outputs. In either case the effect on the retail margin of distribution services depends on whether cost consideration dominate (positive) or are dominated (negative) by demand considerations.

Using the 1982 U.S. census of retail trade disaggregated into 49 retail sectors, the authors explain the variation in gross margins across these sectors in terms of output, distribution services and structure variables. Distribution services are measured as follows: accessibility of location in terms of the number of establishments; assortment as the ratio of the number of establishments carrying a product line out of a universe of thirty product lines to the total number of establishments; assurance of product delivery in terms of inventories per establishment; common information as advertising per establishment; ambiance as the value of buildings and structures per establishment, and specific distribution services as payroll per establishment.

The main results are the following: use of a nonlinear specification, as suggested by the theory, dominates a linear specification both in terms of descriptive measures such as the R^2 and of a nonnested hypothesis test; as

frequently happens in cross-section data, the structure variables (concentration ratios and the ratio of multi-establishment firms to single establishment firms) do not contribute much toward explaining retail margins; the level of output of explicit items (measured as sales per establishment) and the levels of outputs of distribution services provide the main determinants of variations in gross margins across retail sectors. The signs of the individual coefficients reveal that higher levels of output, accessibility of location and assurance of product delivery lead to lower gross margins whereas higher levels of assortment, information and specific distribution services lead to higher gross margins. Ambiance plays no role in the explanation of gross margins with this data.

Juxtaposing the empirical evidence just described with the data of Section III provides some insight into the role of economies of scale in affecting gross margins. As indicated in the previous paragraph, the ability to operate at higher levels of output leads to lower gross margins across the 49 retail sectors analyzed in the previous study. A similar phenomenon is evidenced in Tables 3 and 5 of Section IV. If we look at the food sector in wholesaling (Table 3) we find that it has the highest level of sales per establishment, our measure of output, and it has the lowest gross margin; in contrast, the durables sector in wholesaling has the lowest level of sales per establishment and it has the highest gross margin. Similarly, the food sector in retailing has the highest level of output in terms of sales per establishment and the lowest gross margins; in contrast, the durables sector in retailing has the second highest level of output and the second lowest gross margin. Hence, there is evidence that the realization of economies of scale in distribution leads to lower gross margins.

3. Interbrand Competition

It is possible to gain some additional insight into the nature of this

process and the role of interbrand competition in distribution by looking at the food retail sector in greater detail. The jointness in supply among distribution services as well as between distribution services and the output of explicit products discussed in Section II is clearly illustrated in the evolution of this sector during the 1980s. Our basic data source for this discussion is the Statistical Abstract of the U.S. 1991 (Table 1363). The high levels of sales per establishment reached by the food sector in retailing have been accompanied by significant changes in the structure of this sector.

Food stores can be classified into four broad groups: supermarkets, which are stores (primarily self-service) offering a full range of departments and having annual sales of at least $2.5 million in 1985; superettes which are similar to supermarkets except that they have sales below $2.5 million; convenience stores which offer less breadth and depth of product assortment but greater assurance of product delivery at the desired time through extended hours, and specialized food stores, which are primarily engaged in the retail sale of a single food category such as meat or seafood and, thus, tend to have a greater depth with no breadth in their assortments. Sales per establishment have increased in all four categories between 1980 and 1988. Nevertheless, this has been accomplished in very different ways. Supermarkets and superettes have decreased their accessibility of location in absolute terms during this period. There were 3,100 fewer supermarkets and 17,000 fewer superettes in 1988 than in 1980. In contrast, there were 16,700 more convenience stores and 6,300 more specialized food stores in 1988 than in 1990. Thus, accessibility of location and depth of assortment have increased in the narrow categories associated with specialized food stores and accessibility or location and assurance of product delivery at the desired time for the shallow assortments of convenience stores.

Incidentally, convenience stores increased their share of sales by 3.1 percent between 1980 and 1988 while supermarkets and specialized food stores decreased theirs by 0.7 percent. Superettes suffered a loss of 1.8 percent in share of sales during the period. In 1988, supermarkets still dominated the food category in terms of sales (70.6 percent) while providing only 9.1 percent of the establishments.

Further insight into the operations of the food retail sector can be gained by looking in more detail at the structural changes within the supermarkets category. Our data source for this discussion is also the Statistical Abstract of the United States, 1991 (Table 1364). Supermarkets are classified into: conventional, which are the standard ones described in the previous paragraph; superstores, which are differentiated by containing a greater variety of products than conventional and considerable nonfood (general merchandise) products, i.e., contain broader and deeper assortments; warehouses, which contain limited product variety and fewer services, i.e., less deep assortments and lower levels of assurance of product delivery in the desired form or at the desired time; combination food and drug, i.e. greater breadth of assortment than conventional; superwarehouse, a warehouse with greater variety but still fewer services; hypermarket, a very large store offering a greater variety of general merchandise and personal care products, i.e., broader assortments.

Conventional supermarkets have suffered substantial losses in the 1980s, both in terms of the number of establishments (fallen from above 21,000 in 1980 to 12,000 in 1989) and in terms of sales (from $115 billion in 1980 to $104 billion in 1989). The other five categories have experienced substantial increases over this period, both in terms of number of establishments as well as sales. In Table 8 we present the shares of the distribution of both sales and

establishments in 1980 and 1989. These figures suggest that consumers in 1989 are being given considerably higher levels of breadth of assortment than in 1980, since all nonconventional categories, except for warehouses, provide higher levels of this distribution service. However, this has been accompanied by providing a much lower level of accessibility of location for the supermarket category as a whole in 1989 than in 1980. In addition, warehouses provide lower levels of assurance of product delivery in the desired form. Thus, the costs of providing storage and accessibility of location have been shifted from the distribution sector to the consumption sector while the cost of providing breadth of product assortment have been shifted to the distribution sector, perhaps due to the existence of economies of scope. These processes illustrate the importance of interbrand competition in retailing. That is competition takes place among different institutional forms and the differentiating characteristics of these forms is the provision of different bundles of distribution services.

One implication of these structural changes in food retailing is a change in the demand for distribution services in the wholesale sector. Thus, wholesalers supplying supermarkets have to provide lower levels of accessibility of location and greater levels of breadth of product assortment in 1989 than in 1980. On the other hand, wholesalers supplying convenience stores and specialized food stores have to provide greater levels of accessibility of location and depth of assortments.

Another implication of the above structural changes is that similar processes may be at work in other retail sectors. That is, if there is a greater demand for depth and breadth of assortment and/or economies of scope in the provision of such assortments that also apply to these sectors, one may surmise

Table 8 Changes in the Structure of Supermarkets, 1980-1989

		Conventional	Superstore	Warehouse	Combination	SuperW	Hypermarket
Establishments	1980	79 0	12 0	6 3	1 8	< 0 5	< 0 5
	1989	53 0	24 5	14 8	5 5	1 7	0 5
Sales	1980	73 1	17 7	4 2	4 0	1 0	?
	1989	42.0	30 6	12 3	8 8	4 0	2 3

? not available

the existence of similar structural changes, particularly in the general merchandise area. Several factors point in this direction. First, part of the breadth of assortment provided by nonconventional supermarkets is through the inclusion of general merchandise lines. Secondly, much has been made in the popular press about the troubles being experienced by conventional department stores. Finally, the number of shopping centers has steadily increased.

Demand complementarities leading to retail agglomerations was one of the themes stressed in Section II. The increased levels of breadth and depth of assortment provided in the food sector during the 1980s can be interpreted as evidence of the importance of this effect. Additional evidence in this regard can be presented in terms of the recent changes in the numbers of shopping centers and in their retail sales. Between 1986 and 1989, the number of shopping centers in the U.S. increased by 21.8 percent while retail sales in shopping centers increased by 22.9 percent.[18] Shopping centers provide depth and breadth of assortments at higher levels than stand alone department stores and their growth provides additional evidence of the increased demand for breadth and depth of assortment. In addition, recent innovations in the structure of shopping

[18]These numbers are calculated from the figures in Statistical Abstract of the U.S., 1991 (Table 1366).

centers, for example outlet malls, are consistent with other evidence, e.g. Pashighian (1988), of an increasing demand for variety in fashion goods and thus, depth of assortment. Once again these processes illustrate the importance of interbrand competition in retailing.

4 The Institutional Framework

The operations of a distribution system takes place in the context of the framework of institutions, technology and infrastructure available in a particular society at a particular time. In the United States at least four aspects of the legal framework can be identified as having important effects on the recent operations of the distribution system. Similarly, the extreme mobility of the U.S. population within markets and across markets provided by the transportation infrastructure has had a significant effect on the operations of the distribution system. Finally, the introduction and adoption of new technologies has also affected the operations of the distribution system. We discuss each of these issues below.

As we saw at the beginning of this section vertical integration plays an important role in the functioning of the U.S. distribution system. This role has been facilitated by the evolution of U.S. antitrust policy. Vertical integration can take place through expansion or mergers. Vertically integrating through expansion has not been generally viewed in the U.S. as an antitrust violation, but vertical mergers have been viewed more skeptically until recently (Perry, 1988, p. 244). Partly as a result of the influence of Williamson's arguments on transaction costs economics, however, mergers are now viewed less skeptically, Kassenbaum (1992). In particular, the (1984) Merger Guidelines and their enforcement are consistent with transaction cost economics in several respects, according to Williamson (1988, p. 177) and, perhaps more importantly, their

enforcement leads to a treatment of mergers that is similar to vertical expansion, Perry (1988, p. 247). The major competitive problem identified in the Guidelines having specific incidence on retailing is that forward mergers into retailing may facilitate collusion at the manufacturing stage by making it easier to monitor prices or by eliminating a disruptive buyer. This consideration is circumscribed by the need to show that market structure conditions are likely to lead to such a result.

Another aspect of the legal framework relevant for the operations of the distribution system is the legal status of vertical controls. As noted in the recent OECD report on franchising, in general the U.S. legal system makes a strong distinction between price restrictions and most nonprice restrictions. The former are viewed as per se illegal whereas the others are normally viewed under a rule of reason standards, with tie-ins being an exception in that they are also considered per se illegal in the United States. Notwithstanding, the use of recommended or suggested prices can allow firms to circumvent the per se rule and this has been allowed by the Supreme Court as noted in the OECD report (Ch. V, p. 22). Similarly, tie-ins have been found legal in the U.S. in some cases (improved quality control) although not in others (efficient means of monitoring sales of a franchiser) (OECD, Ch. V, p. 24). The increasing use of private labels suggests that whatever vertical controls are being used in the distribution system have not prevented an increase in interbrand competition. Moreover, the increased number of foreign franchise operations in the U.S., indicated earlier, suggests that legal restrictions in the case of vertical controls have not prevented the development of this institutional form in general, or in the U.S. distribution sector.

The legal status of price restrictions has fluctuated in the U.S. As

Overstreet (1983) notes, they became per se illegal in 1975 after being legal since 1937 in states where the practice was sanctioned by state laws. He notes that price and nonprice restraints can have similar, positive or negative, effects on welfare. Hence, the differential legal treatment is inconsistent from the point of view of economic theory. This point also emerges from Katz' (1988) discussion and it reflects the stand taken by the OECD report. Finally, we note that the same conclusion emerges from the analysis in Section II, i.e. the choice of price policies and levels of distribution services is simultaneously determined. Interestingly enough, that analysis also has the following implication: in monopolistically competitive markets where prices are fixed, all non-price restraints reduce consumer welfare at the retail level. Of course, positive changes in producer surplus upstream may counteract this effect.

Another aspect of the U.S. legal system that impinges on the functioning of the distribution system are "zoning laws." These laws derive from the police power of the states and are subject to general limitations in their applications. They are usually issued by local governments or municipalities. They classify areas into uses by right but they allow other uses under a conditional uses provision, normally requiring a public hearing. The uses and classifications vary from community to community but a typical zoning ordinance would contain the following classification: neighborhood business district; limited retail or heavy commercial; and central business district; highway oriented districts; and one or more floating zones for planned shopping centers. In addition to limiting uses these laws often contain provisions on standards such as maximum number and sizes of advertising signs, maximum floor to area ratios, etc.

Such a system defies simple descriptions. Nevertheless, it conveys an impression of stationarity and rigidity. As argued by Hinds, Carn and Ordway

(1979), however, there are a number of features that provide flexibility (ch. 5). These devices are called flexible zoning. First, there is the conditional use provision (or special use permit) which allows flexibility in altering the original ordinance upon incurring some transaction costs. A second device is floating zones. These are districts included in the original text of the ordinance and not specified in any map. Once the floating zone has been approved in connection with a particular site, it ceases to be a floating zone. These were critical in facilitating the process of suburbanization and the development of shopping centers. Contract zoning allows a particular use in a zone subject to some contract or provision determined as a result of public hearings. Incentive zoning allows a trade-off between the different standards set out in the basic zoning ordinance. Finally, there is the possibility of rezoning, or changing the original ordinance. The substantial changes in establishments and shopping centers described previously suggest that, despite appearances to the contrary, zoning laws have been flexible enough to allow the development of new institutional forms in the U.S. distribution sector, although at the cost of increasing the costs to consumers of attaining the desired levels of product assortment in accessible locations.

One final aspect of the legal framework that impinges directly on the operations of the U.S. distribution system are the so-called "blue laws" or restrictions on Sunday operations. These restrictions are of two types: general, banning most business and labor activity on Sunday; specific, banning particular types of activity of which the sale of alcohol is one of the most popular. According to Laband and Heinbuch (1987), general type of restrictions have been on the decline since 1960 but as of 1985 twenty-two states still maintained some type of general restriction on Sunday openings. Even in these

states, however, the restrictions are circumvented because some states have given the power to local governments to exempt themselves from the state laws provided they receive approval from the local electorate, e.g. Maryland. From our point of view, these regulations are quantity restrictions on the level of output of a particular distribution service, assurance of product delivery at the desired time. They lower consumer welfare by limiting this particular form of nonprice competition. Laband and Heinbuch (1987) perform an empirical comparison of selected economic variables between ten states with blue laws and ten states without blue laws during the 1980s. They conclude that the economic consequences of this subsidy (primarily to most small retailers) implied by the blue laws are a lower level of economic activity, employment and labor force participation as well as the restricted choice imposed on consumers.

Other characteristics of U.S. society also affect the operations of the distribution system. In particular, the development of a transportation infrastructure that supports automobile usage in a land rich society has made the U.S. consumer exceedingly mobile, both within each market and across markets. By lowering the economic costs of accessibility of location to differing institutional forms of retailing, it strengthens price and nonprice competition and enhances the opportunities for cost shifting between retailers and consumers. Another factor enhancing the benefits of this process has been the suburbanization of U.S. society which limits the impact of zoning laws restrictions, because the tools for flexible zoning described earlier make it easier to avoid such restrictions in suburbs. Finally, since shopping centers have played a critical role in this process, it is worthwhile to note a feature of the legal system that has played an important role in their development and, thus, indirectly facilitated the functioning of the distribution system.

As Barzel (1989) has noted, the development of contracts that allow the exchange of some property rights but not others enhances the gains from exchange and, thus, increase welfare. An example he cites is the ability to transfer limited property rights over usage of sites to maintenance and security firms, which can realize economies of scale in the provision of these services to a variety of firms in a particular location such as a shopping center. Such a process is facilitated by the nature of contract law in the United States. As pointed out by Perry (1988), economists' notion of incomplete contracts is at variance with legal practice. The latter interprets contracts where all contingencies are not specific under a reasonableness criterion. Thus, they provide legal protection that encourages the use of contracts in a variety of settings where all contingencies cannot be adequately foreseen and stipulated in the contract as would be the case in a shopping center.

We conclude this section by noting the main technological factor affecting the operations of the U.S. distribution system in the last two decades—computer technology—and discussing its main effects on the operations of the distribution sector. The last two decades have witnessed a dramatic revolution in computer technology and the distribution sector has been fundamentally affected by this process. For instance, at the end of 1971 less than 1 percent of cash registers were electronic units, Paulson (1973); today, the mechanical cash register is obsolete. This process, however, has been motivated by different factors in different sectors and, consequently, taken different forms.

In food distribution the adoption of the Universal Product Code (UPC) has led to an aggressive policy of adoption of scanning technology by supermarkets motivated by the labor savings in price markings and in processing at checkout counters. As reported in a recent newspaper article, Pyatt (1992), the diffusion

rate of scanning technology is impressive. For instance, the leading supermarket chain in the Washington area (Giant Food) started using scanners in a store in 1975. By February of 1979, it had become the first supermarket chain in the country to have scanners in all of its stores. The linking of scanners with computers for use in inventory management is spreading among food retailers, according to the Food Marketing Institute. As noted by Grossman and Palvia (1988), however, adaptation of the technology to other uses, e.g., inventory control, decision support systems and strategic planning, has been slow compared to other retailing forms such as specialty retailers.

The most recent Survey of Retail Information Technology Expenses and Trends (Chain Store Age Executive, 1991) by Ernst and Young provides additional evidence. Of 20 supermarkets in their survey who responded to the questions, 19 were scanning at the point of sale and 1 had no plans to scan. On the other hand, information system expenses represented an average of over 1.00 percent of sales for specialty apparel firms but 0.37 percent for supermarkets.

More generally, the above survey identified two trends that are worth noting here: low rate of penetration of decision support/expert systems in retailing, and an increasing reliance on outsourcing. One reason for the latter can be illustrated with respect to the use of electronic data interchange. The benefits introduced by this technological development are, according to Ferguson, Hill and Hansen (1990), lower level times for orders, higher service levels to customers, fewer stock-out situations and improved communications about deals, promotions, price changes and product availabilities. These benefits permit the provision of higher levels of breadth and depth of assortment and assurance of product delivery and information at lower costs. And, they have facilitated the changes that have taken place in these variables in the distribution sector noted

earlier in this section. Nonetheless, issues of compatibility between computer systems in this area have meant that integrated distributors and chains have been better situated to take advantage of these technologies. Smaller retailers may avoid these problems through outsourcing. To conclude, it is not surprising that El-Ansary (1991) identifies the Telecommunications Revolution as one of the main forces for changes in the structure of the wholesale sector. Indeed, he argues that electronic markets will emerge as the dominant channel configuration.

V. Assessment of Efficiency and Implications for Foreign Trade

How efficient is the U.S. distribution system in providing a broad selection of competitively priced products and attendant services when demanded? The general perception that emerges from the previous description is one of a high level of responsiveness to the changes in the general economic and social conditions affecting U.S. society. As pointed out elsewhere, Betancourt (1991), three long-run trends in socioeconomic characteristics have been especially relevant for the retail sector: an increasing rate of household formation, increasing wage rates, and increases in multiple earner households. These changes have implied an increase in demand for retail products and distribution services, including in particular flexibility in the timing of purchase activities, as well as increases in a main component of the costs of providing these services. The distribution sector has responded with substantial changes in the nature of the institutional forms with which it serves different segments of consumers as well as the same segment at different times within a calendar period. Rising levels of education and availability of information to U.S. consumers has also played a role in spurring these changes.

Perhaps the most useful way of assessing this process is to look at the

changes in the structure and operations of the wholesale and retail sector between 1982 and 1987, while bringing in relevant information from the previous sections of the study at the appropriate points. Once again it is convenient to start with the wholesale sector in order to facilitate the exposition. Tables corresponding to Tables 1 through 5 for 1982 are provided in the Appendix.

1. The Wholesale Sector

A. Changes in Structure

We begin by noting the main changes in the structure of the wholesale sector in this period, which are presented in Table 9. This five year period has witnessed noticeable increases in the number of establishments and employees of the wholesale sector as well as substantial increases in capital intensity. This latter process is most pronounced in the food trade, where capital per employee in 1987 is 50.5 percent larger than in 1982![19] Not surprisingly, there have been substantial increases in concentration, as measured by the sales of the four largest firms relative to the total. The only exception is the nondurables good sector, where concentration went down.

It is also of interest that the provision of specific distribution services by the wholesale sector, measured by employees per establishment, has decreased for the durables sector while it has increased for the nondurables sector. The increase is most pronounced in the food sector. At the same time accessibility of location, measured in terms of density, has increased for both durables and nondurables but the change is most substantial for the durables trade. The food sector experienced no change during the period.

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[19]For comparison we note that the producer price index for capital equipment increased by 9.7 percent over the same period (Table B-61, Economic Report of the President, 1992).

Since concentration is highest for durables and it also increases in this sector, it is worth noting one feature of this data. The most highly concentrated subsector in wholesaling is manufacturer's sales by branches and offices. Yet this subsector's sales as a percent of total sales has actually decreased from 31.4 percent in 1982 to 31 percent in 1987. Indeed, in the durables category, which is the most highly concentrated one in this subsector, sales by manufacturer's out of total sales actually went down from 36.4 percent to 32.8 percent during this period. This decrease may very well reflect the increasing penetration of imports in this area.

Table 9 Changes in Structure of U S Wholesale Sector: 1982-1987

	# of Establishments[1]	# of Employees[4]	Employees/ Establishment[1]	Capital Intensity[1]	Concentration[2]	Density[1]
Total	12 9	12.3	-0.8	33.4	1.3	7.3
Durables	16 1	14.4	-1.5	33.7	1.2	10 9
Nondurables	7 8	9 3	1.0	34.8	-0.3	2.9
Food	9 2	13 2	3.5	50.5	1 4	0 0

[1]Percentage change

[2]Actual change

Horizontal integration in wholesale, as measured (inversely) by the share of single unit sales to multi-unit sales, has increased during this period for all categories. The actual decreases in the share of single units were: total, 1.8; durables, 1.2; nondurables, 1.2; food, 4.9. Interestingly, if we look at the share of sales controlled by 'chains', defined as multi-unit firms with ten or more outlets, we find the actual changes to be: total, 1.0; durables, 1.4; nondurables, -3.5; food, -10.6. Thus, smaller scale firms have been gaining market share in the nondurables wholesale sector.

B. Changes in Operations

These changes are presented in Table 10. One striking result is the increase in the ratio of imports/sales by merchant wholesalers specializing in this function. This increase is most pronounced for durables and attests to the ability of foreign manufacturers to take advantage of this specialized function in the U.S. distribution system. Even in nondurables and food, however, merchant wholesalers specializing in the import function were able to increase their sales faster than all merchant wholesalers during this five year period. Thus, the openness of the U.S. distribution system to importers considerably diminishes the economic importance of the high levels of concentration in the wholesaling of durable goods.

Table 10. Changes in Operations of U.S. Merchant Wholesalers: 1982-1987

	Net Margin[2]	Sales[1]	Sales/ Emp.[1]	Sales/ Est.[1]	Gross Margin[2]	Inv/ Sales[2]	Import/ Sales[2]	Exit Rates[2]
Total	1.2	28.2	11.5	9.8	2.3	-0.1	4.2	1.1
Durables	0.9	51.7	32.4	29.7	-0.7	-3.1	4.9	1.1
Nondurables	1.2	11.7	-1.7	-1.9	3.4	1.1	1.6	3.3
Food	2.0	27.4	13.8	14.4	1.7	-1.6	0.7	1.3

[1]Percentage changes.
[2]Actual changes.

Turning to the other items in Table 10, we see that the sector experiencing the smallest increases in establishments and employees (nondurables) also experienced the smallest increase in sales, an increase in the ratio of inventories to sales and the largest increase in the exit rates of firms at the same time that it was experiencing a decrease in concentration. Furthermore, it experienced increases in gross and net margins while enduring decreases in labor

productivity and economies of scale. This makes the performance of the food subsector of nondurables all the more striking. It has been able to increase labor productivity and realize economies of scale while increasing its gross and net margins.[20] No doubt the dramatic increase in capital intensity in this sector played a role in these changes. This illustrates a well known point. Namely, aggregate concentration ratios, by themselves, are poor indicators of efficiency. The food sector had the largest increase in concentration rates during this period.

Finally, the largest increases in sales, labor productivity and economies of scale were realized in the durable goods sector. At the same time, gross margins decreased together with the ratio of inventory to sales, indicating the ability to provide additional products and distribution services at lower distribution costs while experiencing moderate increases in net margins and exit rates of establishments. It is tempting to surmise that the increasing demand for variety or depth of assortment at the retail level is putting considerable pressure on the performance of the nondurable goods wholesale sector. Within this sector, the food trade has been able to adapt to this pressure and, perhaps, the smaller scale firms in the rest of the sector.

2. The Retail Sector

A. Changes in Structure

We present in Table 11 the changes in the structure of this sector between 1982 and 1987. In the retail sector we see an increase in establishments, employees and capital intensity in all three sectors. The increases are largest

[20]In view of the dramatic changes in the nature of food retailing analyzed in Section IV, one can argue that these positive changes in food wholesaling may have been stimulated by the processes noted earlier.

Table 11 Percentage Changes in Structure of U.S Retail Sector: 1982-87

	# of Establishments	# of Employees	Employees/ Establishment	Capital Intensity	Density
Total	5 7	24 3	18 2	32 4	1 1
Durables	11.3	30.2	17 5	45.4	6 3
Nondurables	3 5	22 9	19 0	29 3	-0 7
Food	0 6	21 6	21 1	24 0	-2 5

for the durables sector in all three categories. They are also lowest for the food sector in all three categories.

With respect to specific distribution services, all categories reveal an increase in the level of these services provided to the consumption and wholesale sector. The increase is largest for the food sector. On the other hand, while the durables sector increases its accessibility of location, the nondurables sector lowered the level of this distribution service and this effect is more pronounced in the food sector, which is not surprising in view of the changes described in Section IV.3.

Overall concentration in the retail sector decreased during this period from 5.5 to 5.2, in contrast to the experience in wholesaling. While the figures for durables and nondurables as a whole are not available for the retail sector, it seems likely that concentration decreased for durables while increasing for nondurables. First, figures are available for the food trade. The concentration ratio increased from 15.4 in 1982 to 16.5 in 1987. Second, the sector with the highest concentration ratio at the two digit SIC level was General Merchandise Stores. In this nondurable sector, the concentration ratio went from 35.6 in 1982 to 37.4 in 1987.

Horizontal integration in the retail trade increased during this period.

The ratio of sales by single unit firms to multi-unit firms went down by 7.6 for the whole sector and by 2.0 for the food sector. Similarly, the share of chains increased by 2.2 for the whole sector and by 2.0 for the food sector.

B. Changes in Operations

Further insights into the changes in the performance of the retail system during this five year period can be obtained by considering Table 12. Exit rates

Table 12. Changes in Operations of U.S. Retail Sector: 1982-1987

	Net Margin[1]	Sales[2]	Sales/ Emp.[2]	Sales/ Est.[2]	Gross Margin[1]	Inv/ Sales[1]	Exit Rates[1]
Total	0.8	43.8	16.7	36.4	1.5	1.0	1.4
Durables	1.3	64.3	29.9	53.0	0.6	0.5	1.6
Nondurables	0.3	32.1	8.2	27.8	2.5	0.5	1.4
Food	0.4	25.3	3.9	24.2	1.2	0.3	2.2

[1]Actual changes.
[2]Percentage changes.

of establishments within the year are higher in 1987 than in 1982, which is indicative of substantial structural change in the retail sector because 1982 was a recession year and 1987 was not. This is particularly so in the food trade, which has the highest increase in exit rates, and the highest levels. In contrast to the nondurables sector in wholesaling, which exhibits similar behavior with respect to exit rates, other indications of performance are favorable in the food sector. Thus, there have been improvements in both labor productivity and economies of scale[21] and sales increased substantially over the

[21]In view of the changes in the nature of food retailing described in Section IV.4, it is clear that sales per establishment in this sector is not only an indicator of economies of scale but also of economies of scope.

period. Since gross margins increased by more than net margins, the costs of providing distribution services relative to sales increased during this period, which is not surprising since the levels of assurance of product delivery (inv/sales), specific distribution services (employees) and institutional forms providing broader assortments also increased.

At the other end of the scale is the durables sector. During this five year period this sector has experienced the largest percentage of increases in establishments, employees and sales; hence providing more products to consumers in more accessible locations and with higher levels of specific distribution services. Since this sector also has experienced the largest increases in labor productivity and economies of scale, it has been able to provide these additional benefits to consumers, together with higher levels of assurance of product delivery (Inv/Sales), while lowering the ratio of distribution costs to sales during the period. That is, it is the only sector for which gross margins increased by less than net margins. Finally, it should also be noted that it has the highest levels of net margins (Table 5); hence, as Table 11 shows, it has experienced an entry rate of establishments over twice as high as that of the other subsectors in this five year period.[22] Increases in labor productivity and economies of scale in the nondurables sector, on the other hand, have not been sufficient to prevent a substantial increase in the costs of distribution relative to sales during this five year period. Perhaps this reflects diseconomies of scope in providing the higher levels of breadth and depth of assortment that consumers are demanding.

While there is no direct evidence on the extent of import penetration in

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[22]It should also be noted that this is also true for durables in the wholesale sector.

the retail sector, there is indirect evidence that there are no unsurmountable barriers. For instance, the evidence cited in Section IV.1 shows that between 1970 and 1988 foreign companies increased their operations of franchised outlets by 929.4 percent! Another point worth making based on figures mentioned earlier is that the increases in labor productivity presented here are based on paid employees during the March 12 pay period and include both full-time and part-time workers. If these increases in the retail sector have come about by employing part-time workers, the implications are quite different than if they represent full time workers. Our assumption has been that the ratio remains the same because the data in Table A1 of the Appendix suggests little change in the average weekly hours of retail workers between 1982 and 1987.

3. Summary

The overall picture that emerges from these considerations of the distribution sector is that of a very dynamic sector undergoing substantial structural changes while adapting to meet consumer needs in an efficient manner. Efficiency in this context means providing different bundles of distribution services demanded by consumers in combination with different bundles of explicit products at competitive prices. This process is most clearly seen in the food sector where newer institutional forms have increased their shares dramatically at the expense of superettes and conventional supermarkets. It also seems to be happening in the other sectors, although other factors have played a key role in these sectors. In particular, competition from imports has been particularly strong in the durable goods wholesale sector, which is the most highly concentrated.

There is also indirect evidence of a shift in economic power from manufacturers to retailers, as measured by sales. That is direct sales by

manufacturers' branches and offices have remained the same as a percentage of wholesale sales during 1982-1987 but sales by retailers have increased considerably more than wholesale sales. Insofar as retailers operate in more competitive markets and are more responsive to consumer needs, this change is likely to increase welfare. Indeed, if all the bargaining power were in the hands of retailers and retail markets were competitive or contestable, the only welfare measure would be consumer surplus as industry economic profits would tend to zero. Finally, the possibility of cost shifting in the provision of distribution services gives consumers bargaining power in their interactions with retailers. While the latter enjoy considerable economies of scope in the provision of breadth and depth of assortments, the former enjoy considerable advantages in the provision of accessibility of location as a result of the extraordinary mobility provided by the U.S. transportation infrastructure. Moreover, modern developments in the provision of information and rising levels of education also create substantial opportunities for cost shifting.

VI. Policy Recommendations

A critical factor in determining the efficiency of distribution systems lies in the power consumers have over their environment. Power in this context means the capability or capacity to affect outcomes. This notion is not as foreign to economics as some may surmise. Indeed, a recent stream of research by prominent economists, Sen (1987), has emphasized the desirability of including capabilities as part of the definition of the standard of living. Consumer control over the environment associated with purchasing activities is one capability that enables the distribution system to perform the function of transferring goods and services from producers to consumers in an efficient manner, i.e., in a manner that satisfies consumer wants. The possibilities for

cost shifting in the provision of distribution services between consumers and retailers provide a basis for the exercise of this 'capability'.

Important determinants of the ability to shift costs are: the mobility of households and their capacity for storage and information acquisition. In this regard, the U.S. transportation system has played a positive role in developing the capability of the U.S. consumers to control their purchasing environment through cost shifting. Hence, the recently enacted transportation legislation (1991 Highway Act) is a welcome continuing step in the improvement, maintenance and extension of this system. An important indirect effect of this factor is in limiting the negative consequences of zoning ordinances. Nonetheless, it might be desirable to consider an explicit evaluation of the effects of existing ordinances on the capacity of new institutional retail forms to come into existence, especially in older more densely populated areas.

Restrictions on hours have been diminishing in the U.S. over the last 20 years. This is true in terms of official state laws and even more so in terms of allowing local jurisdictions to exempt themselves from these restrictions. Once again the mobility of U.S. consumers has been instrumental in rendering these restrictions obsolete and the competitive pressures this factor generates are even more powerful now, since most jurisdictions have eliminated restrictions on hours. Once again these developments enhance the U.S. consumers' ability to shift the costs of providing distribution services.

Perhaps the major factor preventing efficient outcomes in the evolution of the distribution system is the differential legal treatment of price and most nonprice forms of vertical controls. Insofar as the system evolves toward a more widespread adoption of the rule of reason criterion, these effects will diminish and the more recent decisions, mentioned in Section IV.4, provide evidence in

this direction. In any event, these decisions have a similar incidence on foreign and domestic firms. Hence, they limit foreign trade only to the same extent that they limit all trade in sectors where these vertical controls are important for an efficient functioning of the economic system.

Finally, there are general restrictions on the international mobility of capital, labor and goods and services. While the U.S. economic system allows a considerable amount of international mobility of factors, there are restrictions on these flows such as domestic content legislation and the various provisions of immigration laws. Similarly, while the U.S. has been a powerful advocate of trade liberalization, it engages in some practices damaging to international trade. As pointed out by Messerlin (1991), there has been an increasing reliance on voluntary export restraints and anti-dumping procedures. The former inhibit efficiency by limiting product development in the exporting countries and by generating rents; the latter, due to their complexity, provide a mechanism for the operation of cartels and the sharing of markets. Of course, these practices have not been limited to the United States.

Insofar as these restrictive practices increase or new ones are put in place, the efficiency of the U.S. distribution system is impaired. Because these practices can be viewed as either limiting the capabilities or increasing the costs associated with adaptation to the economic environment by U.S. consumers and distributors.

Appendix 1: Additional Statistics

Table A1: Average Weekly Hours of Nonsupervisory Workers

	Manufacturing	Wholesale	Retail
1968	40.7	40.1	34.7
1982	38.9	38.3	29.9
1987	41.0	38.1	29.2

Source: Handbook of Labor Statistics: U.S. Department of Labor.

Table A2: Structure of Retail Sector Excluding Eating and Drinking Establishments

	# of Establishments[1]	# of Employees[2]	Employees per Establishment[3]	Capital Intensity[4]	Density[5]
Total	1,112,290	11,887,820	10.69	16,626	4.58
Nondurables	658,748	8,256,666	12.53	17,723	2.71

See Table 4 in the text for footnotes and sources.

Table A3: Operations of Retail Sector
Excluding Eating and Drinking Establishments

	Net Margin[1]	Sales[2]	Sales/Employee[3]	Sales/Est.[4]	Gross Margin[5]	Inventory/Sales[6]	Exit Rates[7]
Total	4 2	1.345	126	1 210	29 0	14 3	7 7
Nondurables	3.7	794	.096	1.205	30 1	11 6	8 0

See Table 5 in the text for footnotes and sources

Table A4: Structure of U.S. Wholesale Sector, 1982

	# of Establishments[1]	# of Employees[2]	Employees/ Establishment[3]	Capital Intensity[4]	Concentration[5]	Density[6]
Total	415,829	4,984,880	11 99	23,003	5 0	1 79
Durables	256,103	2,912,848	11 37	19,458	11.2	1.10
Nondurables	159,726	2,072,032	12 97	28,064	4.7	0 69
Food	38,516	673,765	17.49	20,697	6.5	0.17

[1]From WC82-S-1, Table 1.

[2]From WC82-I-4, Table 7

[3]Column 2/Column 1.

[4]Ratio of acquisition value of depreciable assets for merchant wholesalers at end of 1982 in millions of dollars (from WC82, I2, Table 1) to number of paid employees of merchant wholesalers per pay period including March 12 from Table 7 in WC82, I-4

[5]Percentage of sales of four largest firms to all sales, from Table 8 in WC82, I-1

[6]# of establishments per 1,000 residents

Table A5: Extent of Vertical Integration of Manufacturers, U.S. 1982[0]

	Percent of Total Sales[1]	Percent of Sales to Retailers[2]	Percent of Sales to Wholesalers[3]
Total	31 4	32.5	22 6
Durables	36 4	31.6	14 7
Nondurables	27.4	33.4	30.7
Food	22.1	52.9	34 9

[0]All figures taken from Table 1, WC82-S-4.

[1]Percentage of sales of manufacturer's branches and offices relative to total wholesale sales

[2]Percentage of Sales by manufacturer's branches and offices to retailers relative to total wholesale sales by manufacturer's branches and offices

[3]Percentage of sales by manufacturer's branches and offices to wholesalers relative to total wholesale sales by manufacturer's branches and offices

Table A6: Operations of U.S. Merchant Wholesalers, U.S 1982

	Net Margin[1]	Sales[2]	Sales/Employee[3]	Sales/Est [4]	Gross Margin[5]	Inv/ Sales[6]	Import/ Sales[7]	Exit Rates[8]
Total	2 9	1,163	.296	3 445	17 8	11.2	11.0	4 5
Durables	3 8	480	207	2 295	24 3	17.6	17 2	4 4
Nondurables	2 3	683	423	5.307	13 3	6 7	6 6	4 7
Food	1 1	175	.347	6.006	13 5	4.7	5 7	4.9

[1](Gross Margins-Operating Expenses)/Sales from WC82-I2, Tables 1 and 5, in percentage terms

[2]Sales in billions of 1982 dollars from WC82-I2, Table 1.

[3]Sales/Employees which are both taken from WC82-I4, Table 7 The numbers represent millions of 1982 dollars of sales per employee

[4]Sales/Establishments which are both taken from WC82-I4, Table 7 The numbers represent millions of 1982 dollars per establishment.

[5]Gross margin as a percentage of sales taken from Table 6 in WC82-I2

[6]Inventories at end of 1982/Sales for 1982 both taken from WC82-I2, Table 1.

[7]Sales of importer merchant wholesalers/Sales of merchant wholesalers; both figures taken from WC82-I4, Table 7 (in percentage terms).

[8](Establishments in operation any time during the year-establishments in operation at end of the year)/Establishments in operation any time during the year. From Table 1, WC82-I1. These numbers refer to all wholesalers rather than just merchant wholesalers (in percentage terms)

Table A7: Structure of U.S. Retail Sector in 1982

	# of Establishments[1]	# of Employees[2]	Employees per Establishment[3]	Capital Intensity[4]	Density[5]
Total	1,424,839	14,467,813	10.15	10,832	6 12
Durables	609,703	2,788,541	6 81	10,502	1 76
Nondurables	1,015,036	11,679,272	11.51	10,911	4 36
Food	189,502	2,347,603	12 39	13,228	0.81

[1]Constructed from sectors classified as durables and nondurables in RC82-S3, Appendix G.

[2]Constructed from sectors classified as smaller and nondurables in RC82-I, Table 1.

[3]Column 2/Column 1.

[4]Obtained as the ratio of acquisition value of depreciable assets at end of 1982, from RC82-I2, Table 2, to column 2. The dimension is 1982 dollars per employee

[5]# of establishments per 1,000 residents.

Table A8: Operations of U.S. Retail Sector in 1982

	Net Margin[1]	Sales[2]	Sales/Employee[3]	Sales/Est [4]	Gross Margin[5]	Inv/Sales[6]	Exit Rates, 1982[7]
Total	3 4	1,039.	.072	729	30 8	12 1	7.0
Durable	3 6	326	117	.796	26 8	17.7	5 6
Nondurable	3 4	.713	061	.702	32.6	9 6	7.5
Food	2 0	241	.102	1 272	24 4	6 3	7.0

[1](Gross Margins-Operating Expenses)/Sales from WC82-I2, Tables 1 and 5

[2]Sales in billions of 1982 dollars from RC82-I2, Table 1

[3]Sales/Employees The numerator taken from column 2 above and the denominator from Table A7, column 2. The dimension is millions of 1982 dollars per employee.

[4]Sales/Establishment The numerator taken from column 2 above and the denominator from Table A7, column 1 The dimension is millions of 1982 dollars per establishment.

[5]Gross margins as a percentage of sales taken from RC82-I2, Table 5

[6]Inventories at end of 1982/Sales for 1982 Both taken from RC82-I2, Table 1

[7](Establishments in operation anytime during 1982-Establishments in operation anytime during 1982)/Establishments in operation anytime during 1982 Both taken from RC87-S3, Appendix G.

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