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large or skilled the staff may be. It is desirable nonetheless that the data necessary for the spot-checking of actual prices should be available on invoices.

It is futile for either governmental agencies or research institutions to attempt accurate studies of the actual behavior of steel prices from an examination of existing invoices. Until such time as steel companies may adopt invoice forms that record essential price information, any investigating agency must rely on statements of company executives for the elements entering into the delivered price.

IV

PROGRAM OF FEASIBLE RESEARCH PROJECTS

THIS and the following chapter deal with research projects in the iron and steel industry that appear to be practicable in view of the availability of data and the degree of necessary industrial or governmental co-operation. Chapter VI includes a broader outline of projects, discussed without regard to their immediate feasibility.

It will be obvious that some of the projects overlap in varying degrees. The study of prices leads of necessity into all the complexities inherent in the economic structure of an industry. Hence an attempt to eliminate any apparent duplications in the projects suggested would only result in an arbitrary and sterile delineation of research areas. It is believed, however, that the *objectives* implicit in each project do not overlap and that any monographs developed from them will be complementary but not repetitious.

It has been pointed out elsewhere in this report that the iron and steel industry is a multiple not a single industry. Its products may be grouped according to the economic and technological conditions of production, the economic mobility of the product, the concentration—geographic or corporate—of buying power, the availability of substitutes, and the degree of overlapping, on the part of integrated

firms, of stages of manufacture or processing. It is imperative then that the student of iron and steel prices approach his subject on a 'group-commodity' basis. To this end, many commodities customarily blanketed in a given category under a general name (e.g., 'sheets') must be subdivided in accordance with the competitive influences affecting their sale and distribution. Although in some projects reference will be made to specific commodity problems, these must be considered illustrative rather than exhaustive.

One further warning cannot be overemphasized. Every student of price and pricing policies should recognize that price, either the published quotation or the actual dollar value per unit paid by the buyer, may be a nominal and, in some transactions, a secondary consideration. It is impossible to understand pricing policy in iron and steel if one confines one's analysis to the narrow concept of price and implicitly or explicitly assumes an atomistic view of sales. It is true that steel (neglecting specialties) of a given specification is homogeneous irrespective of source but it is not true that each steel company provides the same delivery service (even relative to a contract schedule) or that each has the same percentage of rejections. Again, a monetary concession given when steel capacity is underutilized, if allowed to divert patronage from one source to another, may result in poorer service when the rate of utilization of steel capacity is high. Finally, a host of considerations of mutual advantage or pressure (engineering services, the reciprocal purchase and sale of other products and services, common financial interests) may be the determining factors in sales. Other sources of modification in quoted prices will be found in direct concessions by rebates, the waiving of extras, special credit terms, 'freight absorption', and peculiarities in the freight rate structure, such as fabrication-in-transit rates. The student of price and pricing policies in the iron and steel industry must always be alert to these and other conditions of sale which affect directly or indirectly the apparent characteristics of the prices he is analyzing. Although these qualifications are not made explicitly in each case, they

must be considered to qualify the research projects here suggested.

In a rough way these projects are grouped according to the type of agency best fitted to undertake them. Three types of operating agency are specified: governmental bodies, research institutions, and individual investigators. It will be apparent, however, that this is an arbitrary classification. Aside from a proposed revision of governmental statistics, whether a project can best be undertaken by a governmental body or a research institution depends largely on the confidence and co-operation it stimulates or commands. Most projects suggested for research institutions might be so broken down on a commodity or area basis as to make possible significant contributions from individuals with proper guidance and industrial connections.

A PROJECTS SUITABLE FOR GOVERNMENTAL AGENCIES

Some of the most elementary statistics for research in price economics in the iron and steel industry have not yet been published. Published base prices (the period of the Code of Fair Competition excepted) are known to be nominal but the extent of their divergence from actual prices, which varies from time to time, has never been accurately ascertained. Indirectly involved in any explanation of price behavior in the industry, but likewise unavailable, are shipments of iron and steel by products to geographical areas or to industry classes and production of iron and steel by products together with their inventories.

In recent years the larger steel companies have installed machine tabulation systems for the mechanical analysis of their shipments but the punch controls are far from uniform. Some record, among other items, tonnage and value shipments from each works to counties, cities, or states (or some combination of these areas) together with the basing point on which price was computed, the freight added in the delivered price, and the freight allowed on the shipment to destination. Some companies record sales alone, rather than shipments, and distribute sales according to the location of

the purchaser's office rather than the destination of the product. A majority of companies have no mechanical tabulating systems and record manually much more abbreviated data. Many keep no records of shipments whatsoever. No companies record extras and very few indicate this price element even on invoices.

Although this is a problem with which the Temporary National Economic Committee is known to be concerned and on which it may be expected eventually to make certain recommendations, the following projects are enumerated as being peculiarly within the scope of a governmental agency. In presenting these projects the Committee has not attempted to take a position on the general issue of whether the iron and steel industry should be required by law to make more adequate statistical reports to governmental agencies. The Committee does, however, desire to urge that neither private nor governmental agencies should attempt to generalize with respect to the complex economic problems associated with the industry's pricing structure and price policies unless the sort of data indicated in this study can be made available.

1 Formulation of a Uniform Reporting Plan for Essential Statistics, including Production, Shipments, Inventory, Delivered Prices and Extras

This project would require an analysis of: (1) the methods by which steel companies now record these data for their own purposes; (2) the actual geographical distribution of iron and steel by products and possibly by industry classes within such areas; (3) installed capacity by products and by company works in relation to geographical location of works and consuming areas.

Lack of uniformity in steel company records does not necessarily imply a difference in either interests or problems. It may mean no more than that the system has grown without rational or long range direction. At any rate, it would be the object of investigation (1) above to attempt a standardization of product definition or product groupings

so that comparability could be obtained without burdensome expense or the sacrifice of important company objectives. It is not necessary that all companies keep such records or make reports. The decision in each case must be made with relation to the size and importance of the company for the particular product on which reports are to be made.

Analysis of the actual distribution of products by areas and industry classes will facilitate a more intelligent delineation of consuming districts for which reports might be made in the future. The lack of coincidence between political and economic boundaries is too obvious to be labored. In some states many areas, some overlapping state boundaries, are required for significant analysis; in other regions, a satisfactory consuming district may comprehend several states. The determination must rest on the economic characteristics of the region as a consuming area for iron and steel products and the location of steel works and basing points modified by the enhanced cost of compilation where areas are unwieldy in number. To allow maximum use of data, consuming districts should be identical for all products currently reported and should be uniform for all companies.

If price or distribution data are to be made even approximately comparable, it is imperative further that the extras and deductions applicable to given shipments be recorded on the invoices, punched on the tabulating cards, and aggregated and reported for shipments of each product into each consuming district. Since steel products are ordered to specifications adapted to particular uses, the list price for base specification is no more than the basis on which actual price is computed. The extra list is a complex price list which may be varied for particular uses or users without disturbing the published price. Its significance in the final price is naturally dependent on the degree of standardization in the finished product. But so long as extras are used, only the broadest and most general price analyses can ignore them. Notation on the invoice by products would make possible a spot check from time to time to determine

whether published extras were in fact charged. Current reporting of aggregate extras for shipments by products into each consuming district would minimize improper interpretations of reported data.

The areas for which data—production, inventories, shipments, prices—should be published raises an administrative and a political issue, the question of disclosure. Irrespective of the ultimate decision, however, it is evident that actual reports should be made for each separate works or works group where several may be operated as an integrated unit. Monthly data would be ideal but the frequency of reports must be adjusted to the clerical burden imposed on reporting companies and on the agency chosen to aggregate and release the data. Quarterly reports would probably prove adequate for most purposes.

2 *Appraisal of the Effectiveness of the Iron and Steel Schedules of the Census of Manufactures as Tools for the Analysis of Pricing Problems in the Industry*

Research workers on price aspects of the industry would be greatly benefited if they had for reference a careful appraisal of existing census data. Such appraisal should indicate not only the limitations of usefulness of the data for certain problems but also methods for classifying existing data to the end that they could be made useful for recording more accurately the major trends in costs, values, and production.

Included in this project might also be recommendations for practicable modifications of the schedules. For example, it would be desirable to have incorporated in the schedules returned by the iron and steel industry detailed information on the value of important specific products sold by it. Information for identical products should be obtained under 'materials purchased' from the principal consuming industries. If possible, these data should be collected in such form that figures reported by the steel industry for a special product would be comparable with figures reported for the same product by the consuming industry, i.e., such items as transportation charges should be excluded or listed separately.

3 Use and Effects on Pricing Structure of Standard Extras

The book of extras and deductions constitutes a complex, arbitrary, and varying price system—a source of confusion in actual pricing and of potential discrimination among buyers. Published extras and deductions are practically identical among sellers at any given time, irrespective of type of mill or utilization of capacity. In actual pricing, however, extras constitute a fertile source of price concessions or price change without disturbing base prices. The entire significance of the base price quotation may be altered by varying the specification of steel to which it is applied.

The classification of products, determination of extras, and establishment of basing points for such product classifications may likewise be employed as a means of insulating 'products' arbitrarily in accordance with use and the character of markets to be served. For example, light plates, skelp, black plate for tinning, strip and sheet may be and often are rolled on the same mill. Arbitrary delimitations of width, length, size, and gauge serve to separate one from the other for pricing purposes. It is plain, of course, that the marketing conditions surrounding the manufacture and sale of black plate (a stage in the production of tinplate and, therefore, containers), for example, are quite different from those affecting sheet or strip (important raw materials of the automobile industry, among others). By insulating the one from the other, their respective base prices may be adjusted to the competitive pressures in their respective markets.

Finally, without alteration in base prices or extras but through variations in the American Society for Testing Materials standards for physical performance, tensile strength, tolerances, etc., the entire significance of price with relation to the requirements of consuming industries may be altered.

It may be assumed that a governmental agency undertaking this project would be intent upon improving the intelligibility of price data in the industry. Hence it would

be appropriate for such an agency to study the (1) historical development of the use of standardized extras in quoting steel prices; (2) extent to which such extras are indicative of attempts to adjust prices to varying costs; (3) extent to which they may be used to segregate products, manufactured under conditions of joint costs, according to the marketing conditions applicable to such products; (4) extent to which the significance of base prices for an analysis of the steel price structure is modified by the use of standardized extras.

The problem here presented is twofold. On the one hand, it involves the whole system of extras and deductions for any given steel product. What factors determine the base specification and variations in that base specification from time to time? Is the base specification characteristic in the sense that most sales are made in that range or is it adapted to the requirements of important consumers? Does the range of extras approximate the costs of off-base specifications or is it determined largely by factors other than the direct costs involved? (This question requires analysis according to the size and integration of works, type and rate of utilization of equipment. The extras are uniform among mills but the economic and technological conditions of production are different). Is it possible to devise a list of extras and deductions less cumbersome in detail and more revealing as to its true function?

On the other hand, product classification within the range of products rolled on a given mill should be analyzed with relation to the extras applicable. Is there sufficient variation in production costs or in applicable physical standards or tolerances to justify differential pricing? Is product differentiation of this type chiefly a means of obtaining the advantages of differing conditions of demand in various industries?

The issues suggested here are both broad and narrow. They are narrow in that the significance of extras for any given consumer or consuming industry can be measured approximately. The characteristic specifications of steel commodities required in that business over a period of

years can be ascertained and the variation in costs due to extras can be computed from the extra book. This change in cost would then be related to changes in the base prices for the steel commodities respectively and, by reference to the applicable standards, to changes in quality. The issue is extremely broad in that it involves the whole pattern of steel prices, potential price rigidity on an industry-wide scale, and the price relationship between large and small customers as well as between different consuming industries. This is clearly a problem for a governmental agency.

B PROJECTS SUITABLE FOR RESEARCH INSTITUTIONS

1 *Competitive Repercussions of the Elimination of Interbasing Point Price Differentials and the Establishment of New Basing Points*

In June 1938 the United States Steel Corporation, through the Carnegie-Illinois Steel Company, announced a price reduction at Pittsburgh and, at the same time, quoted prices at Birmingham and Chicago equal to those at Pittsburgh. This revolutionary action—the elimination of time honored interbasing point price differentials—precipitated a general readjustment of pricing points in the industry. A series of new basing points were set up by companies in their respective areas and, with negligible exceptions, the price quoted was identical with the Pittsburgh price. Thus new bases were established for plates at Cleveland, Youngstown, and at Claymont, Delaware. Cleveland, Youngstown, and Middletown, Ohio, became basing points for hot-rolled sheets, hot-rolled strip, and cold-rolled sheets while Chicago, Buffalo, and Sparrows Point were also made bases for sheets. Gary became a basing point for strip; Chicago and Buffalo for cold-rolled sheet; Cleveland and Chicago began to quote on cold-rolled strip. During the second quarter of the preceding year, 1937, the Granite City Steel Company had established a base at Granite City for several products including sheets, black plate, and tinplate. A slight price differential over other basing points, however, was retained at Granite City.

A study of the causes and consequences of the establishment of a basing point comprehends the economics of production and distribution and the whole gamut of competitive and monopolistic forces focusing in pricing policy. Fortunately, however, in many of the changes mentioned in the preceding paragraph, the location of a single large works at a given basing point, both before and after the change, allows a measure of isolation that makes possible fruitful research. Since in a delivered price system the establishment of a basing point at a company's works is not a prerequisite either to 'meet competition' or to make a price for any given customer or market area, the reason for setting up a base is far from evident. 'Excess' capacity for the product in question, low production costs, public opinion, advantages of simplification of pricing and selling within the basing point area,[1] pressure from influential customers, retaliation against prices quoted at existing bases, shifts in the major market for the output of the plant—these, or even more intangible factors like prestige, may dictate the decision.

In addition to the reasons for the changes in the system in June 1938 there are two broad studies (or groups of studies) suggested by the increase in the number of basing points and the concomitant elimination of most interbasing point price differentials. (1) Repercussions of the change in the pricing system on the competitive situation of particular consumers, consuming industries, or consuming regions. (2) Repercussions of the change in the pricing system on the competitive situation of the steel company or companies involved. Both subjects may be investigated on a comprehensive or narrow basis and, though different in approach, each project is but a phase of the larger problem—the economic significance of the establishment of a basing point.

[1] Given the prices quoted at existing basing points and assuming that delivered prices are strictly computed, each 'basing point area' might be delimited for any given product by an analysis of freight rates. When the 'formula' is honored in the breach (apparently, the normal situation for important customers at least), the labor involved in such a computation is not justified by the significance of the results. Some arbitrary definition of areas may prove reasonably satisfactory.

1) Pertinent data for the consumer approach would include statistics (preferably monthly or quarterly) on the consumption of steel by products during a period of years before and after the establishment of the basing point, showing (a) quantity of steel purchased; (b) delivered cost per unit; (c) source of steel purchased; (d) method of delivery of purchased steel; (e) other business or cost factors that might modify the significance of steel price changes during the period. Extras, if possible, should be separately distinguished and delivered costs less extras could then be compared over the period with delivered prices computed from published base prices and freight rates.

Basic queries this study should clarify are: Was the cost of steel substantially reduced to consuming industries in the regions affected by the establishment of the base or did the new base merely recognize a *de facto* price situation? What effect, if any, did the change have on the competitive advantage of local consuming industries; on the source from which steel was purchased; on steel purchases? Did the establishment of the new base affect in any way the method of delivery; the inventories of steel carried?

2) For the steel company approach, more detailed data would be required but the labor involved could be lightened by sampling (it being understood that some commodities for which the works had capacity but did not set up a base should be studied along with basing point commodities). (a) Product capacity, production, and rate of utilization of capacity by products should be ascertained throughout the period, including the charge for sample base and nonbase commodities, and results should be compared with those for the industry as a whole. (b) Distribution of shipments by products from the new base works to selected consuming districts should be compared before and after the change. (c) Mill-net prices received on shipments of particular products into particular areas should be compared over time and related to the average mill net on all shipments. (d) Shipments to particular customers or regions (cf. customer analysis above) should be analyzed. (e)

Changes, if any, in methods of delivery and selling or warehouse distribution, and in pertinent cost items should be studied. (f) Other reasons for or effects of the change might be ascertained from interviews or from company files, if available.

Major issues to be analyzed in this phase of the study may be suggested. Did the establishment of the base alter or materially affect the steel company's distribution of its shipments; its sales, amount of freight absorption or its mill-net price for steel; method of delivery? Was the base adopted in conformity with any substantial shift in the steel company's markets for particular products (i.e., regional specialization in its markets); the acquisition or development of important steel customers; any change in the freight rate structure; a reduction in its production costs; an increase in its capacity to produce particular products? Why was a base set up for some and not for other commodities manufactured? Was there any substantial difference in the company's 'excess' capacity for such commodities; the geographic distribution of its shipments of them; the size and concentration of consumers of those products; the method of distribution employed? At what point are possible economies of large scale production and utilization of capacity offset by high freight charges to consuming areas (i.e., freight absorption)?

The opportunity presented by the changes in June 1938 for a study of these issues in areas in which the forces at work may be most adequately isolated can best be realized if this project is undertaken by a research institution prepared to conduct its inquiry over an extended period.

2 *Analysis of the Competitive Significance of Non-producing Basing Points*

Some steel is produced on the Pacific Coast but the western seaboard states are supplied primarily by eastern mills. No steel is produced in the Southwest. Nevertheless basing points, for certain products, have been established on the Pacific Coast and at Gulf ports. The primary objective of

this project should be to inquire into (1) the reasons for the establishment of such basing points and (2) their effect on the price structure of the industry. The following queries will indicate the major issues involved.

1) Have the prices established at these basing points shown sensitivity to variations in the volume of imports in such regions?

Have these prices reflected variations in the prices at which imported steel was sold?

Is there evidence that prices established at these points were maintained with fixed differentials over prices at producing basing points, for example at Pittsburgh?

What evidence is there that other factors, e.g., competitive pressure of large buyers, may have determined price variations at these points?

2) To what extent has the chaotic price situation in the Southwest been caused by diversion in transit, at inland points, of products priced on a Gulf port base? (e.g., products sold on a Houston, Texas, base and shipped by rail from Chicago might be stopped at Dallas, for instance, at a price advantage equal to the freight rate from Houston to Dallas. Furthermore, products sold for delivery at Corpus Christi (water-rail via Houston) with rail freight allowed might be diverted at Houston. The net cost to the buyer would then be lower than the base price. The latter is customarily identical at all Gulf ports.)

3 Historical Behavior of Published Prices by Products: An Analysis of Similarities and Dissimilarities in Price Trends

A first step in price research in the iron and steel industry is to segregate from published price series or list prices those commodities which evidence similarities in fluctuations or trends over an extended period. Since trend is more important than cyclical variation for this purpose, the nominal character of published base prices may be ignored and the study confined to prices quoted at a single basing point. Because it alone is a basing point for most steel products,

Pittsburgh would be desirable. To ensure comparability in the quoted prices for each given product over time, however, changes in base specifications, in standard quality characteristics, and in extras would have to be ascertained and discounted.

The initial grouping of products in accordance with the degree of correlation in their price fluctuations and trends will itself pose questions, the answers to which are fundamental in any appraisal of price characteristics or price policy in the industry. Are commodities, similarly priced, commonly rolled on the same mill? Are they sold under similar competitive conditions? (By "similar competitive conditions" is meant the number, size, and geographical concentration of buyers, the ability of buyers to produce their own steel requirements; the economic availability of substitutes; the economic mobility of the product; the characteristic methods of distribution; the relative importance of steel cost in the price of the finished product; reciprocity between buyer and seller; etc.). Are iron and steel products, similarly priced, substitutes for one another in any important use or at any range of prices (e.g., pig iron and heavy melting scrap in the production of open-hearth steel)? Is the definition of products in any given group related to use and market requirements or to methods of production? For products manufactured in whole or in part on the same mill but displaying different price characteristics are there any special factors in production sufficient to explain their differences (e.g., special labor, raw material, processing, or handling costs)? Do products, originally rolled on different mills but subsequently rolled on the same mill (e.g., flat-rolled steel on the continuous mill), alter their price characteristics with changes in their methods of production? These questions are illustrative of many others relative to production, use, and distribution that should be raised to account for the dissimilarities as well as the similarities in historical price behavior.

It is apparent that this project may be made as wide or as narrow as the resources and the ability of the investigator

may dictate. In its broadest interpretation it necessarily overlaps other projects suggested in this section. In its more restricted sense, it could be confined primarily to a statistical analysis of relevant price, production, and man-hour data.

4 Reciprocity as a Factor in Pricing Policy

By reciprocity is meant all considerations that determine the purchase or sale of iron and steel products other than price or price concessions in the form of shading the base quotation, waving extras, granting rebates, or 'absorbing' freight.

Steel companies are large purchasers of a wide variety of products: raw materials—firebrick, coal, oil, gas, limestone, iron ore, various alloys, various metals, palm oil, and a host of others; equipment and construction materials for furnaces, rolling mills, warehouses, fabricating shops, and office buildings; services—transportation, public utility, financial, agency; and a multitude of consumers' goods and services for company retail stores and commissaries. At the same time steel companies sell many commodities only indirectly associated with steel—byproducts in the manufacture of coke or the operations of blast and open-hearth furnaces; coal produced in their own mines but not of proper grade or size for their own use, products further fabricated from iron or steel, etc., and provide a variety of specialized services such as engineering, laboratory testing, drafting, experimentation. Industries from which purchases are made are often themselves large users of steel in the form in which it leaves the rolling mills or of steel products in which the source of steel used may be specified by the purchaser. Here, then, is a fruitful field for the exercise of bargaining pressures through an allocation of steel company purchases among sellers who are in a position directly or indirectly to specify sources for the purchase of steel products. This power over the potential buyer of steel may frequently be a function of the size of the steel company and the variety of its operations—possibly an important

consideration in the development of huge corporations in the iron and steel industry.

Only a frank discussion with steel company sales executives and consumer purchasing agents or a thorough file search could be expected to illuminate this phase of sales policy. But the influence of reciprocity on pricing policy might be approached indirectly through an analysis of steel company purchases. To what extent do reciprocity deals alter the competitive relationships between large and small steel producers? In what industries is reciprocity relatively important and what steel products are most directly involved? Is there a significant difference in product price behavior where reciprocity is important and where it is negligible? Are there other factors that account for the price characteristics observed? Are prices more or less flexible where reciprocity is important?

5 Potential Price Control Through Vertical Integration of Production Processes

Vertical integration, for the present purpose, excludes the combination of processes involved in the manufacture of a rolled steel product in a single works or group of works (i.e., coke ovens, blast furnaces, open-hearth or bessemer furnaces, rolling mills). It also neglects operations characteristically carried on in the same works, such as galvanizing and tinning. It is concerned primarily with further-finishing operations like the manufacture of pipe and tubes, the drawing of wire and manufacture of wire products, the fabrication of bridges, structurals, etc., the construction of ships and barges, and the manufacture of culverts, roofing, and other steel products. These and other activities that require distinct breaks in the continuous integrated production of steel may be regarded as distinct industries. 'Integrated' steel companies dominate further-finishing processes, shipbuilding, and the structural industry. They are important factors in many other manufacturing activities. When steel companies, through purchase or otherwise, own or control important operating units in these steel-using

fields, vertical integration may have a profound effect on the competitive situation, both among steel companies and within the industry invaded, and on the level and stability of the prices of steel used in those industries. This project is important, then, both for an understanding of price and price policy for certain commodities and for an appraisal of competitive forces in the steel industry. The following questions will suggest some of the basic issues involved.

1) In terms of capacity, production, sales, size, and location of producing units, how important is each steel company in the particular industry invaded? What steel products are consumed by the industry in question and what proportion of the output of each steel product is customarily taken by it? What proportion of the steel products consumed in each such industry is supplied by the integrated steel company? Is there any evidence that the fabricating units or subsidiaries of the 'integrated' steel companies use their competitive power in the steel-consuming industry to capture the most desirable business or to force independents to purchase their steel requirements from themselves or their affiliated companies? Are the prices of steel commodities primarily sold to consuming industries in which integrated steel companies are a dominant factor more or less stable than those of commodities taken by 'independent' industries? Do relative price trends of such commodities reflect the competitive pressure of the integrated steel mills?

2) Has the margin between the prices of semi-finished or finished rolled steel (purchased as a raw material by non-integrated consumer-competitors) and the prices of the further-finished steel products widened or narrowed over time? Are there any cost factors that might account for the variations in the margin observed? (Contract rather than published base prices for steel purchased by non-integrated companies would be required accurately to determine these conversion margins.) Are the markets for the finished products of the non-integrated steel companies limited by the activities of fabricating units of integrated steel companies

in consuming industries? What economies, if any, are available in the vertical integration of further-finishing processes, fabrication, and manufacture with the production of rolled steel products? Is there anything in the location or operation of works or in the methods of sale and distribution that indicates that such potential economies are important considerations for management?

Like the analysis of new basing points, this project may be handled piecemeal from the viewpoint of individual consumers, consuming industries, or regions. Thus the scope of the project and the character of the investigation may be adapted to the resources and contacts of the investigator or research agency.

6 Price Competition in the Distribution of Steel Products with special reference to Mill Stocks

Most steel is distributed directly from the mill to destination in order to reduce handling charges to a minimum. Indirect distribution through jobbers or from jobber stocks is important primarily in further-finished products such as wire and wire products, pipe and tubes, galvanized and formed roofing products, which are used in relatively small quantities by ultimate consumers or consuming fabricators over wide areas, and in other steel products for fill-in orders and small users. Pipe and tubes traditionally have been distributed through consignment stocks, a practice probably extended to other products since the Code period. The operating margin of the independent jobber is derived from jobber discounts on some products, commissions on others, and the difference between large and small quantity prices (i.e., purchases in sufficient quantity to avoid extras for small quantity and to earn carload freight rates and sales in smaller quantities at extras above base prices). In certain areas, especially tonnage-deficit areas like the Southwest and the West, the large integrated steel companies have established mill warehouses from which shipments are made to jobbers and consumers in the areas served.

This project has two objectives, either of which may be

studied independently: (1) Pricing practices used in conjunction with mill stocks and consignment stocks may be used by the large integrated companies to undermine the competitive position of their smaller, more specialized rivals. (2) Such tactics further raise the issue whether distribution of steel products through mill warehouses and consigned stocks is more efficient or socially more desirable than through jobbers. A few of the major questions with which these investigations would be concerned are:

1) At what locations, on what dates, and by what companies have mill warehouses been established? What iron and steel products are stocked and what is the customary inventory of each? Are sales from warehouse stocks made to jobbers or to other customers or to both? Are prices the equivalent of mill or of warehouse prices? Are quantity extras usually charged? Is business solicited on a mill-price basis? What effect, if any, did the establishment of mill warehouses in the region studied have on the proportionate distribution of total regional sales and of sales to jobbers by integrated and non-integrated steel companies? What effect, if any, did mill warehouses have on the number and distribution of consignment stocks and the number of commodities sold on that basis? To what extent may chaotic price conditions in certain areas such as the Southwest be attributed to the use of mill stocks, consignment sales, vague or lax jobber classification? Have customers in the area benefited in price or service from the distribution methods employed?

2) Are the services performed by legitimate jobbers—warehousing, incidental fabricating, selling—in any way inferior to those performed by mill warehouses? Are the costs of operation for the former in any way greater or less than those of the latter? Does the use of consignment and mill stocks stimulate competition or does it increase distribution costs, price discrimination, and controlled sales?

The competitive impact of mill warehouse price policies on the jobber trade and on the relation of integrated to non-integrated steel companies might be studied in any

region, but it is especially important in those southern and western areas served primarily by eastern mills.

7 Influence of the Freight Rate Structure on the Pricing of Iron and Steel Products

The freight rate structure obviously affects the desirability of location for both steel mills and consuming industries and is an important factor in both the establishment of basing points and the determination of pricing policy followed at such points. Three phases of rate making particularly pertinent to steel price structure give rise to the following queries:

1) What is the extent of interterritorial freight rate discrimination? Are differential rates which depend on the direction of haul significant for the relative competitive position of steel mills in Pittsburgh and Birmingham, for example? Are zone rates in part responsible for the peculiar pricing system in Texas? Do long-haul as contrasted with short-haul rates modify the apparent competitive advantage of location of western mills in comparison with mills in the Pittsburgh-Youngstown districts? Is such modification of competition particularly striking when the latter mills ship to western and southern markets via rail-water routes? To what extent are steel company owned railroads, barges, and steamships used to force rate concessions from railroads?

2) What is the effect of fabrication-in-transit rates on the competitive position of fabricators? To what extent does the practice of shifting inbound bills of lading, so as to maximize freight rebates, effectively exclude some steel mills from supplying certain fabricators on certain projects? To what extent does this practice give 'outside' fabricators a competitive advantage over local fabricators? To what extent has this practice forced price concessions equivalent to the fabrication-in-transit privilege? Does a significant amount of 'cross hauling' result from the practice? Has this practice been an important stimulus to the invasion of the fabricating industry by steel producing companies?

3) What is the effect on the steel price structure of

freight rebates on products manufactured for export? This query is particularly pertinent with respect to prices of tinplate and black plate used in the manufacture of containers.

It is obvious that this project might be limited, if desired. For example, a study might be based on the operations even of an individual fabricating concern. Answers to the questions in section (2) above could then be sought in a study of the firm's sources of steel and its markets over a given period.

8 Competitive Significance of the Price and Quality of Iron and Steel Scrap

Although scrap may be substituted for iron ore in the blast furnace with a consequent saving of coke and flux as well as ore, its major importance in the steel industry lies in its partial or complete displacement of pig iron in the manufacture of steel. Other conditions being favorable, a charge of 80 per cent scrap in an open-hearth furnace is common and some plants run almost entirely on scrap. Limiting factors in the substitution of scrap for ore or pig iron are the relative prices of each, the supply of scrap of known chemical composition, the volume of steel ingots produced, and the technical characteristics of installed equipment. This project, therefore, is concerned primarily with three basic trends in the industry: (1) operating practice as modified by relative prices of ore and scrap, pig iron and scrap, and volume of steel ingots produced; (2) changes in the supply of scrap of known chemical composition as compared with shifts in production from heavy to light steel products and from carbon to alloy steels; (3) the competitive significance of these trends for integrated versus semi-integrated works, for the determination of advantageous location of steel works, and for price competition among rolled steel products.

These broad objectives of the study suggest certain lines of investigation illustrated in the following groups of questions.

1) What has been the ratio of the production of pig iron

for steel-making purposes to the total production of steel ingots—open-hearth, bessemer, and electric—since the beginning of the century? (These data should be compiled on a monthly basis.) What has been the ratio of the heavy melting scrap price to the price of pig iron and how is it correlated with the amount of scrap used relative to the total output of steel ingots? What has been the ratio of iron ore used to the output of pig iron? Does this ratio reflect blast furnace practice in the use of scrap? What limitations of relative cost, of technical operating conditions, or of other factors limit the use of scrap in the blast furnace? in the open-hearth furnace? in the electric or open-hearth furnace in the manufacture of alloy steel? To what extent has scrap been substituted for other materials in the production of alloy steel?

2) Of the total scrap used what has been the proportion of home-produced to purchased scrap over time? of carbon and alloy scrap? What has been the trend in supply of scrap of various known chemical specifications (i.e., carbon and various alloys)? To what extent is supply correlated with production of these respective classes of steel? What is modern practice in the segregation of scrap among scrap dealers and from what sources is scrap collected?

3) What has been the trend in the number of works operated entirely or predominantly on scrap? What reduction does the construction of works designed to operate substantially on scrap alone effect in the minimum efficient capacity of plant? in the total investment in plant? in the location of plant? Is there any evidence of increased price competition among steel mills because of the use of scrap, either through reduced costs or increased decentralization of works location? What influence, if any, has the increasing use of scrap had on the control or ownership of ore properties by integrated steel companies? on the beneficiation of ores? on the economic availability of ores?

Although the potentially revolutionary implications in the use of scrap render it desirable that this project be con-

ducted along a broad front by a research institution, certain phases might be investigated by a qualified individual.

9 The Flow of Capital, including the Growth and Decline of Firms, and the Direction of New Investment in Particular Products and Areas relative to Changes in Prices, Pricing Patterns, Production, and Major Technological Developments

Parts of this project would carry investigators beyond the field of prices proper, but it should be conducted with major emphasis upon the relation of prices, price policies, and price patterns to the flow of capital. The study would involve an attempt to answer the following questions, among others:

1) Has the source of new capital in the industry been predominantly reinvested earnings, borrowed capital, or share capital?
2) Has the rate of flow of new capital been correlated more nearly with price changes, shifts in demand, or technological innovations?
3) To what extent have individual firms lost their corporate existence or their corporate independence?
4) To what extent has the capacity of such firms been eliminated?
5) To what extent has new investment taken the form of increases in existing capacity at existing locations?
6) To what extent has new investment led to shifts in capacity at basing point vs. nonbasing point locations?
7) To what extent has the direction of new investment been influenced by changes in markets, transportation, prices and availability of raw materials and labor?

This project should be divided into studies on a regional, finished product, and an integration basis (i.e., the relation between finished rolled products, semi-finished rolled products, ingots, and pig iron).

Although some of the individual questions raised by this project might be undertaken by one investigator working

alone, the complexity of the issues and the evident need for industry co-operation would suggest that the project as a whole would require the staff of a recognized research institution.

10 Changes in Corporate Structure and in the Degree and Types of Integration in relation to Prices, Pricing Patterns, and Production

This study contemplates a twofold objective: It essays primarily to appraise trends in concentration of financial control and internal organization of firms for production and sales. Further, so far as may be possible it would deal with the claims and evidence of relative economies of integration, specialization, size, and distribution efficiency, to indicate whether and how far industrial concentration has been dictated by financial motives associated with monopoly control and how far by operating economies. Special attention should be given the following aspects of this problem:

1) Outright ownership, interlocking directorates, intercompany investments, intermanagerial agreements among iron and steel companies and agreements between these companies and (a) their sources of raw material such as coal, iron, scrap suppliers; (b) consumers of their byproducts such as utility, chemical, fertilizer, and cement companies; (c) consumers of their steel products.

2) Community of interest in common banking connections (with or without representation) as well as possible ties between these banking groups.

3) The effect, if any, of patented processes on iron and steel prices.

The investigating agency should have sufficient financial support to conduct a field study supplemented by questionnaires in addition to the examination of governmental and other documents.

11 The Influence of the Byproduct Coke Oven on the Location, Amount, and Concentration of Capacity; the De-

gree of Integration; Production and Pricing Patterns in the Iron and Steel Industry

This project requires specialized knowledge and some industry co-operation for success. It might, therefore, be properly carried out by a research institution.

12 Influence of the Continuous Rolling Mill on the Location, Amount, and Concentration of Capacity; the Degree of Integration; Production and Pricing Patterns in the Iron and Steel Industry

Changes in basing points for hot-rolled sheet and strip in July 1938 were apparently influenced by the installation of continuous mills for making these products.

Probably this project could be carried out successfully only if conducted by trained research workers under competent direction. Hence it is suggested that it be undertaken by an institution rather than by an individual.

C PROJECTS SUITABLE FOR INDIVIDUAL RESEARCH WORKERS

The projects listed below could be undertaken by individual research workers. They are intended to be suggestive of the type of research that would enhance economists' knowledge of the price structure and pricing policy in the industry. In each instance the individual research worker would expand or restrict his investigation in accordance with the funds and data available.

Interbasing point price differentials

In view of the more thorough analysis of this subject included in research project B-1 above, this study is suggested primarily as a statistical analysis by products of the quoted price differentials over a considerable period.

Changes in quality of a given steel product relative to changes in its price, i.e., its base price and the extras applicable, over a given period

An outstanding illustration of quality change is found in rails, especially in the development of lighter and more durable rails through the use of alloys and of welding. Similar changes

in structural steel may alter profoundly the character of the so-called heavy steel industry.

The relation of wages, materials, etc. to prices (as developed from Census data)

Price differentials between semifinished and finished products especially in relation to changes in integration, e.g., a study of conversion margins

Changes in terms and conditions of contracts for various iron and steel products as related to pricing policies or pricing patterns (an historical study)

For example, contract prices for tin containers, covering packers' requirements over three to five years, are determined by formula from the published price of tinplate. There is, therefore, little advantage to can manufacturers in attempting to force a reduction in the published price of tinplate. This is probably a significant factor in the relative rigidity of tinplate prices.

Theoretical vs. practical capacity in relation to changes in prices

The relation between tariffs and prices of some particular steel product

For example, over what area would a reduction in existing tariffs extend the shipments of the imported steel product? How important is the marketing area thus affected to domestic steel companies?

V

ANALYSIS OF TWO IMPORTANT RESEARCH PROJECTS

IN THIS chapter we discuss the details of two projects that seem particularly important (though not necessarily immediately practicable): (1) effect of the basing point price practice upon regional economic development; (2) elasticity of demand for individual iron and steel products. By an intensive analysis of these two problems it is hoped to illustrate the difficulties that beset price research in this field. Needed data are not available and in many cases do not