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The preceding discussion should serve not only to reveal important price problems involved in the production and distribution of iron and steel products but also to indicate the need, in dealing with price behavior in this industry, of taking cognizance of the different characteristics of various groups of products.

III

STATISTICAL DATA PERTAINING TO THE PRICE STRUCTURE

In our description and appraisal of important available material relating either directly or indirectly to price problems in the iron and steel industry we cover only primary sources of data.[1] Many of the sources of published data listed below refer merely indirectly to price information; that is, they include information on costs of materials, quantity and value of output, capacities, balance sheet figures, and other data that might be useful in analyzing price problems in the industry.

PRIMARY SOURCES OF DATA BEARING DIRECTLY OR INDIRECTLY UPON PRICE RESEARCH IN IRON AND STEEL

American Iron and Steel Institute

1) *Directory of the Iron and Steel Works in the United States and Canada.* Most issues contain information on rated capacities for making all raw, semi-finished, finished hot-rolled, and other further finished products by plants for each operating company in the United States and Canada. (The 1935 Directory did not contain data on semi-finished capacities.) Moreover, they describe furnaces and other equipment, often giving the year of construction or of last reconditioning. The more recent issues include also summary tables giving total capacity for products by states. The fifteenth edition of this Directory was published in 1901

[1] The ultimate primary sources of most data are, of course, the records of the individual companies. Such data, however, are not usually available to the research worker.

and subsequent issues have appeared in 1904, 1908, 1912, 1916, 1920, 1926, 1930, 1935, and 1938.

2) *Annual Statistical Report.* The *Annual Statistical Report* contains the most comprehensive group of production and price statistics for the iron and steel industry. Production figures are given for pig iron and ferro-alloys, by use, grade, fuel, states, and in Pennsylvania and Ohio by local districts. The Report gives also average daily production figures, information on materials consumed and changes in number of blast furnaces and in capacities, by types of fuel, by states, and in Pennsylvania and Ohio by districts. Each issue gives information on furnaces abandoned and new furnaces constructed.

The information on steel production pertains to kind of steel, by states or groups of states; active and idle steel works, by states; and construction and dismantling of steel furnaces and rolling mills. Several tables relate to production of hot-rolled products. For all kinds of finished rolled products, information is presented by states, and in Pennsylvania and Ohio by districts. Statistics for each important hot-rolled product are given in some detail especially for rails, structural shapes, plates and sheets, tin plate, and pipes and tubes. Some annual reports contain tables relating to capacities by products and states; the production and shipment of iron ore, coal, and coke by source of supply and in general by destination. These figures, however, are not equivalent to consumption figures. Special tables give production statistics for the Youngstown district and for Allegheny County, Pennsylvania; and imports and exports by article.

The price series extend back over the preceding decade and consist of monthly quotations from *Iron Age, Steel,* and private sources for most major products at major basing points. These prices are going prices or reported prices and may or may not be invoice prices. The price section also includes information on iron ore and Connellsville coke. Certain financial data, such as investments, earnings, net income, and dividends for a group of companies comprising

over 90 per cent of the capacity in the industry, as well as some additional information on production figures in Canada, on price figures in England, and on world figures on the production of iron ore, pig iron, and steel are also included. These statistical reports have been issued annually since about 1870, first, by the American Iron and Steel Association, and in 1908 and since, by the American Iron and Steel Institute. In the annual statistical reports since 1933 several tables have been omitted, notably those for production districts in Ohio and Pennsylvania.

3) *Steel Facts.* These bulletins have been issued irregularly, usually every month or so, since October 1934. They contain miscellaneous news items concerning production, wage rates, hourly earnings, relative operations, description of operations, and operating rates. Occasionally notes are included on trends in steel prices in comparison with trends of prices of other metals, on investment in new equipment, and on the tax burden of the industry.

4) Freight tariffs.

No. 1 Water Routes—South Atlantic, Gulf, and Pacific Coast ports

No. 2 Railroads—official territory

No. 3 Railroads—Southern territory

These rate schedules cover most iron and steel products and are revised from time to time.

5) Newspaper releases. Each week the Institute releases to newspapers information on the operating rate for the steel industry, and each month the only monthly production figure for steel ingots. Occasional releases relate to other production and also to price matters.

Code authority for the iron and steel industry

(During the life of the National Recovery Administration, the Board of Directors of the American Iron and Steel Institute acted as Code Authority.)

1) Uniform Extras and Deductions for Products of the Iron and Steel Industry under the Code of Fair Competition, 1934

These releases were used during the Code period in an effort to see that uniform prices held on all iron and steel products and that the prices varied with any significant variation in the shape or quality of the products.

2) Code of Fair Competition for the Iron and Steel Industry: Regulations and Commercial Resolutions

3) Miscellaneous notices concerning jobber agreements, jobber lists, labor

Governmental agencies

1) United States Bureau of the Census

The Bureau of the Census collects information from the iron and steel industry by establishments on production, by products, by consumption of materials, by employment, and by consumption of fuel and purchased electric energy. Most of the data relate to the United States as a whole, but value figures for production, cost of materials, and employment are given by states and in a few instances by industrial areas. From value figures, average per unit selling values can be obtained. The production figures are broken down according to whether the products are consumed in the works, transferred to other plants, or sold. Moreover, the tables present detailed information on the products manufactured from finished rolling mill products. Census information contains also tables describing the equipment and indicating whether it is active. In 1929 for the first time the *Census of Manufactures* contained information on the distribution of sales by type of outlet. For industries other than iron and steel it is possible to obtain some information on the consumption of heavy iron and steel.

Before 1899 the *Census of Manufactures* was issued decennially. From 1899 to 1919 it was issued every five years, and since then every two years. The information for a given year is usually not available until the second following year.

Census of Distribution, published for 1929. Contains information on sales by type of outlet, by industry. However, the iron and steel information is lumped in one total, except for that on scrap iron.

Census of Business. For 1933 and 1935 the information collected here is similar to that collected for 1929 by the *Census of Distribution.* In 1935 it includes Distribution of Manufacturers' Sales.
Census of Mines and Quarries
Census of Occupations
Distribution of Sales of Manufacturing Plants, 1929

2) National Recovery Administration

Code of Fair Competition for the Iron and Steel Industry, 1933, and (revised code) 1934
Geographic and Population Differentials in Minimum Wages, undated
Report of the National Recovery Administration on the Operation of the Basing Point System in the Iron and Steel Industry, 1934, with five appendices and a supplement
Control of Geographic Price Relations under Codes of Fair Competition, by Gustav Seidler, Jr., Work Materials No. 86, March 1936

3) United States National Labor Relations Board

4) United States Federal Trade Commission

Federal Trade Commission vs. United States Steel Corporation et al., Docket 760
In the Matter of Federal Trade Commission vs. Bethlehem Corporation et al., Docket 962
War-Time Profits and Costs of the Steel Industry, issued in 1925 contains detailed cost data, mainly for the War period, for coke, pig iron, steel ingots, and rolled products; also data on investments and earnings, by companies making these products.
Report of the Federal Trade Commission to the President with respect to the Basing Point System in the Iron and Steel Industry, 1934
Practices of the Steel Industry under the Code, report of the Federal Trade Commission to the United States Senate, mainly with respect to pricing problems in the industry.

5) Bureau of Labor Statistics

Monthly Labor Review. Presents information on hours and earnings and also on wholesale prices for general groups of commodities. From time to time it publishes also iron and steel prices, obtained from trade journals and not directly from the trade.

Miscellaneous monographs. From time to time the Bureau of Labor Statistics publishes bulletins on wages and hours in the iron and steel industry (such as Bulletin 567 in 1931 and Bulletin 513 in 1929) and also on productivity of labor (such as Bulletin 474 in 1928) on merchant blast furnaces and Bulletin R-240 in 1930 on 'Labor Costs of Iron and Steel'.

6) Bureau of Internal Revenue

Statistics of Income for various years. Contain information from income tax reports on earnings in different industries among which is iron and steel.

7) United States Tariff Commission

Iron in Pigs, issued by the Tariff Commission in 1927. Presents information on costs and prices for merchant blast furnaces in various sections of the country and comparisons with foreign production and price figures.

Iron and Steel, issued in 1938 as Report 128, second series. Presents information on domestic and foreign price policies, domestic and international trade, and tariff problems. Few new primary data are included.

8) Bureau of Foreign and Domestic Commerce

Survey of Current Business, monthly release of the Department of Commerce. Contains information on many price and production series relating to the iron and steel industry as well as indexes and price quotations for other general groups which might be used for other comparative purposes.

Basic Metal Markets in the United States, the Iron and Steel Industry, 1936. Contains statistics and maps on the distribution of production capacity by products, nearly all of which were obtained from the American Iron and Steel

Institute, *Directory of the Iron and Steel Works of the United States and Canada, 1935*

9) United States War Department

Report of the Chief of Engineers, United States Army, issued annually. Contains information concerning the movement of goods on internal waterways and at ports.

10) United States Bureau of Mines

Mineral Resources, now called *Minerals Yearbook*
Statistical Appendix to Minerals Yearbook. Contains information on the production of iron ore, coal, and occasionally includes their prices.
Classification of Iron and Steel Scrap, 1936

11) Federal Court Records

Federal Trade Commission vs. United States Steel Corporation et al., Docket 760, also known as Trial Examiner's Report of the Pittsburgh Plus Case
For the District Court of Delaware, No. 1060, in Equity: United States of America vs. Weirton Steel Company, 1935
For the District Court of Delaware: United States and Weirton Steel Company, 7F Supp. 25, 1934
United States Circuit of Appeals for the 5th Circuit, National Labor Relations Board vs. Jones and Laughlin Steel Corporation
Others

12) United States Senate

62d Cong., 1st Sess.: Report on Conditions of Employment in the Iron and Steel Industry in the United States, Senate Doc. 110
73d Cong., 2d Sess., Committee on Education and Labor: Hearings on S. 2926
73d Cong., 2d Sess: Report of the Federal Trade Commission, Practices of the Steel Industry under the Code, Senate Doc. 159 (1934)
74th Cong., 1st Sess., Committee on Education and Labor: Hearings on S. 1958
74th Cong., 2d Sess.: Hearings before a subcommittee of

the Committee on Education and Labor on Senate Resolution 266

74th Cong., 2d Sess.: Hearings before the Committee on Interstate Commerce on Senate Resolution 4055, A Bill to Prevent Uniform Dealing Prices (short title) (1936)

13) The Temporary National Economic Committee

a) Public hearings on domestic and export price practices and policies in the iron and steel industry (including iron ore) were held in Washington before the Temporary National Economic Committee from November 1 to 15, 1939. Further hearings will be held in January 1940, at which time steel companies, and especially the U.S. Steel Corporation, will present analyses of economic and other factors conditioning price policies as well as the results of their operations. The record of these hearings, with exhibits filed by the Department of Justice and by the steel companies, is expected to provide information on price problems in the industry hitherto unavailable.

b) As a part of the monopoly investigation, the Department of Justice is supervising a study of pricing in the iron and steel industry. The following questionnaire forms were sent out to iron and steel companies in December 1938 and in January 1939: Form A, *Distribution of Selected Carbon Steel Products;* Form B, *Distribution and Pricing of Selected Steel Products.* The former applies to tonnage shipped by individual plants in each of the three years 1936-38 and covers eighteen selected steel products. The latter covers the distribution of ten selected steel products from selected mills to major consuming districts during February 1939. It includes data for tonnage, invoiced delivered value, freight added to base price, actual freight, and total extras. An analysis of these data will be presented, along with other information, to the Temporary National Economic Committee and will therefore be available to students.

Other primary sources

1) Iron and Steel Operating Companies

Annual Reports to Stockholders
Books on Prices and Extras, issued from time to time
Lists of Products in Stock at Given Warehouses

2) Trade publications

Iron Age, a trade journal, issued weekly. Contains complete lists of prices for iron and steel products at all recognized basing points and changes in those prices from week to week. Moreover, each month it publishes production figures on pig iron by districts. From time to time all pertinent available information on prices, capacities, production, shipments, and consuming industries is included.

Steel. Covers same field as *Iron Age.*

Daily Metal Trade

American Metal Market. Both daily and in its annual statistical handbook called *Metal Statistics* includes a broad list of statistics on production, trade, and prices, most of which is gathered by the American Iron and Steel Institute or trade journals.
Coal Age. Contains current information on coal prices and output by districts.

3) Financial services

Moody's. Material collected mostly from annual corporation reports.
Poor's. Same.
Standard Statistics Company Releases. This Company presents from time to time studies of individual industries and more particularly an analysis of the operating and financial condition of individual corporations.
Brookmire's Service
Other services

4) Trade associations other than the American Iron and Steel Institute

National Flat-Rolled Steel Manufacturers
American Steel Warehouse Association

American Institute of Steel Construction
Central Fabricators' Association
Steel Plant Fabricators' Association
Institute of Scrap Iron and Steel, Incorporated

These associations from time to time issue information on the consumption of heavy iron and steel products, but few or no data on prices are available.

5) Daugherty, de Chazeau, and Stratton, *The Economics of the Iron and Steel Industry*. Contains considerable previously unpublished material, including:

Engineering estimates of assembly costs for making pig iron by districts

Many special tabulations made by the U. S. Bureau of the Census for the Bureau of Business Research, University of Pittsburgh, relating to capacity and production by size of operating company, degree of integration, producing districts, and by type of product.

Statistics on price filings obtained from the Code Authority.

Several special tabulations furnished by the American Iron and Steel Institute relating to operating and financial conditions of operating companies.

6) Worthing, Marion, Comparative Assembly Costs in the Manufacture of Pig Iron, *Pittsburgh Business Review*, January 1938, pp. 21-5, recent comprehensive tabulations.

7) E. G. Nourse and Associates, *America's Capacity to Produce* (Brookings Institution, 1934). In Ch. XII and on p. 585 are presented data on the capacity for making pig iron, both 'rated' and 'practical' capacity.

APPRAISAL OF AVAILABLE DATA RELATING DIRECTLY OR INDIRECTLY TO IRON AND STEEL PRICES

Most published prices of iron and steel products are prices as of recognized and generally accepted basing points. These prices are usually quoted in cents per pound for specified quality, size, and amount of a given product, not necessarily for *typical* specifications. The extent to which

these prices are an adequate indication of actual sales prices and changes in prices for any given steel product is almost impossible to determine. Their appropriateness, however, is modified by two considerations: the extent to which the purchase on base specifications of steel is characteristic of purchases in general and the extent to which these published base prices are actually used for the indicated product.

To the base quotation for a standard purchase of a given steel product are usually applied extras or allowances relating, in the main, to size, shape, quality, or special treatment. These are usually uniform for the industry, and carefully defined. Thus, "quantity extras and deductions are determined by total weight of a size (one gauge or thickness, one width, and one length) of one grade, one analysis, and one finish, released for shipment to one destination at one time." [2] The base price, in other words, may be merely a part of the invoice price. In fact, it is usually only the starting point from which invoice prices are computed, even when the quoted price is adhered to as a base. Relatively little of the steel actually sold may be of the kind described by the base price. Though steel is often referred to as a bulk product, the necessity of meeting different consuming requirements for special chemical composition and heat treatment may mean that one producer will sell as many as 600 different 'kinds' of steel in a year. Many 'steels' are practically custom-made to suit the specifications of individual customers.

Variations from published prices may result from either price concessions or premiums. Although price behavior in the industry was made much more nearly uniform by the actions of the Iron and Steel Code Authority under the NRA, many effects of which are still apparent, special discounts to both consumers and jobbers still exist. These may take the form of waiving extras relating to shape, quality, or treatment or of charging non-uniform extras. Or, on the other hand, speedy delivery which usually results in special

[2] See the last page of any issue of *Daily Metal Trade*.

costs may be made without extra charge. In order to grant a price rebate to some consumers, they may be classified as jobbers and given special agency discounts, or, if a purchaser is both a jobber and consumer, he may receive a jobber discount on all the steel he purchases. Under the Code, however, there was a prohibition against making special jobber or agency agreements in order to allow trade discounts to concerns not primarily jobbers. Price concessions in the form of special jobber discounts were allowed, however, under the Code to certain large consumers, such as railroads, oil drillers, and to some manufacturers (wire products manufacturers, e.g.) upon agreement that they would use and not resell the steel they had purchased. In the main, these special discounts seem to have been extra discounts for purchases of large quantities. Furthermore, price concessions have resulted from classifying good steel as 'seconds' or in improving the quality of the 'seconds.' This, in effect, constitutes price cutting on prime or near prime material. At times it has been reported that steel producers have waived extras for special treatment, such as annealing, cutting, treating, coupling. Under such circumstances, the superior material may even have been billed as being of a lower grade. Price concessions would also result from allowing extra weight in a shipment and billing the buyer for a smaller, agreed-upon amount.

Under the basing point system, delivered prices practically always are computed on the basis of railroad freight rates from designated basing points. When the Code of Fair Competition under the National Industrial Recovery Act was drawn up for the iron and steel industry, it was provided that all prices should be delivered prices determined by reference to designated basing points for each product. This action was both the recognition and the strengthening of previous practice. Since railroad rates are published and relatively stable, they offer the most convenient basis for agreed transportation charges. Together with certain arbitrary switching charges, they have been issued from time to time as rate books by the American Iron and Steel Institute.

Special price concessions are probably made on transport costs, especially in those instances where delivery from the mill is actually made by water.

Many of these practices of granting concessions are accentuated during business depressions when a buyer's market exists. During a severe recession, when plants are operating at a low percentage of capacity, it is, in fact, generally understood that considerable concessions are made from published prices, with respect both to the price itself and to advantages granted to customers in quality, conditions of sale, terms of delivery, and other billing conditions.

On the other hand, during periods of prosperity, actual prices may exceed printed quotations. Several independent producers have been known to accept price premiums for prompt delivery during such periods. Some evidence of price premiums is noted in the trade publications from time to time, as, for example, during spring 1937. Moreover, during periods of prosperity, a customer's decision to purchase steel from a particular producer is likely to be determined by some special consideration as to the terms of sale, including speed of delivery.

At present no adequate information is available on how much steel is sold at a given price by specific mills in particular consuming areas. Nor is specific information available on the geographic distribution of shipments. A study by the National Recovery Administration for the second quarter of 1934 showed shipments of products produced at and shipped from mills operating within 50 miles of Pittsburgh to defined consuming districts. The study indicated the absorption or addition of freight on such shipments segregated according to the basing point on which price was computed. No data were presented for individual products. A study being made for the Temporary National Economic Committee for February 1939 will show the distribution of selected products from selected plants to particular geographic areas. In addition to tonnage information each works will report for shipments into each area the total invoice delivered value, the freight charges added, the actual

freight paid, or allowed, and the amount of extras included in the delivered price. These data will be reported separately for each product for each selected steel works and for each basing point on which price was computed. For a larger selection of steel products (18 in number), shipments from each works of all the important companies to each defined consuming district mentioned above will also be made available for the T.N.E.C. for each of the calendar years 1936-38. These data will be compiled for individual products also but will show tonnage alone.

The records of the American Iron and Steel Institute contain price filings of members of the Code of Fair Competition of the Iron and Steel Industry over the approximately two years during which that Code was in effect. Additional collateral material might be obtained from the United States Bureau of the Census and from other governmental bureaus. But such associations and agencies are not likely to permit free access to their records and would probably release information, if at all, only on the basis of requested tabulations. Considerable study would be necessary to decide what forms to use in such instances.

In the event that price research involves the use of capacity figures, it may be well to emphasize here the nature of the present data. The issues of the *Directory of the Iron and Steel Works of the United States and Canada* published at intervals of several years by the American Iron and Steel Institute present capacity figures by plants for existing units even though they have been idle for some time and may never be used again. On the other hand, since 1925, the capacity figures presented in the *Annual Statistical Report of the American Iron and Steel Institute* exclude these obsolete and idle capacities. These figures have been called 'rated' capacities. All estimates of blast furnace capacity now issued by the American Iron and Steel Institute are based upon a 360 day year and make allowances for time lost in relining, rebuilding, and otherwise repairing equipment. For open-hearth furnaces an allowance of 12½ per cent is made. The figures for 'practical capacity' for making pig

iron presented in *America's Capacity to Produce* are roughly 11 per cent less than the figures issued by the Institute.

For finished rolled capacity the method of estimation was changed in the 1935 Directory. At that time, all capacities for finished products were related to the available steel supply or to actual performance in production. As a result, in some plants the capacities reported for rolling mill units were thus reduced to the equivalent capacity that could be supplied by the plant's furnaces.

APPRAISAL OF DATA

USUALLY RECORDED ON INVOICES TO CUSTOMERS

Even approximately to ascertain actual prices for steel requires invoice analysis. But apart from the fact that a large steel company may have upwards of 20,000 invoices in a single month, the invoice is a very unsatisfactory document for analysis. With some exceptions: (1) a single invoice may cover several kinds and specifications of steel products; (2) extras are not shown either as a total or by products; (3) the basing point on which price was computed is omitted; (4) the freight from basing point to destination is not shown. Furthermore, the price on which the delivered value shown is computed depends on the underlying contract and, unless prices have been falling, this is likely to differ from published base prices even in the absence of base-price concessions. Deliveries even on quarterly contracts often overlap the beginning of a new quarter, while many products are sold on long term requirement contracts (contracts for plates, shapes and bars extend 6 to 9 months or more; for tinplate, until the beginning of this year they held for a 9 months' season; contracts for semi-finished and finished rolled steel sold to non-integrated producers are often for several years; etc.). Finally, there is nothing on the invoice to indicate special allowances in the form of rebates, credit arrangements, etc.

It is not practical, therefore, to propose for either a private or governmental agency a periodic evaluation of actual steel prices by an invoice analysis, no matter how

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