Industrial Overcapacity

A Graphic Analysis of Current Plant Facilities in the United States

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WE ARE pleased to present the following data concerning the relation between production capacity and actual production in American industry. We are indebted to the United States Bureau of Foreign and Domestic Commerce for permission to reproduce the charts, and to Mr. Robert F. Martin of that Bureau for the explanation. These data are of significance, for at the present time there are many discussions of causes of the depression which hold as a major premise the existence of overinvestment and overcapacity. This premise has generally been an empirical generalization; now we have in these official data a substantial factual basis for it. We are grateful for the privilege of making it available. (Editor).

FOR the important segments of industry covered, the accompanying charts show consistently for a number of years a physical capacity to produce (on a normal-shift operating basis) that has greatly exceeded actual output performance. While severely affected by the present industrial depression, this excessive capacity has in most cases existed in important proportions during the preceding period of prosperity.

There are many valuable estimates of capacity as related to production at a given time for numerous other industries, based on surveys and special studies. The purpose of this paper, however, is to present in convenient form some of the best data available on a current basis.

No wholly satisfactory general definition for normal capacity has yet been devised, and the methods of estimating this basis for comparison have varied widely as between sections of the same industry. For this reason it is necessary to a reasonable judgment of the significance of each statistical series here portrayed that the basis of capacity estimation in each case be taken into account.

With some exceptions, as will be noted, actual production has here been related to the estimated normal output that could have been expected if existing plant facilities had been utilized regularly on a full normal-shift basis. For convenience the single-shift basis is used in many cases when actually most of the equipment is planned to run normally on a more extended schedule. This tends unduly to minimize the idleness indicated by the data as related to planned normal operation.

For the iron and steel industry the data are mostly on the normal-shift production basis. The textile estimates attempt to show the actual utilization of equipment from the standpoint of time as compared with a "normal" activity. The paper industry data for the most part relate actual output to an estimated "practical" production, while the miscellaneous group uses widely varying bases of calculation.

In the iron and steel industry group, some part of the pig iron furnaces shown as idle in the first chart were inactive for usual reasons of production, such as relining. These data, therefore, are given simply to show the existence over a period of years of the situation more accurately portrayed, from the excess capacity point of view, in the pig-iron production chart at the right. The data for this chart were not available prior to 1928. Capacity in this instance is estimated annually by the American Iron and Steel Institute.

Malleable iron castings capacity prior to 1928 was based upon the total number of units of molding floor space times the average production per molder per day per unit of floor space, times the number of actual working days per month. In no case was production capacity based on floor space calculated in excess of melting or annealing capacity. Beginning in 1928, capacity was taken for each plant as equal to its best average production in any six consecutive months since January, 1919.

Output of fabricated steel plate has been related to new orders rather than production, which accounts for the more pronounced month-to-month fluctuations. The same characteristic is apparent in the case of fabricated

structural steel; the ratio of shipments to capacity shows a distinct seasonal movement, but not so important month-to-month fluctuations as is the case with new orders.

The definition of capacity as estimated by the fabricated steel-plate industry is the tonnage which could be produced working on a single shift on the class of contracts usually secured. The estimates for steel ingots productive capacity are made in annual surveys by the American Iron and Steel Institute.

Average monthly shipments for the best six consecutive months since January, 1919, have been taken as capacity production for commercial steel castings.

Periodic surveys by the National Association of Flat Rolled Steel Manufacturers determine the capacity for steel-sheet production. An increase of rated capacities by about 11 per cent in September, 1927, affects the comparability of the data during the period about that date.

Productive capacity for steel barrels has been based on the daily number of fifty-five-, thirty- and fifteen-gallon standard light barrels made of twenty-gauge or heavier steel and fifty-five-gallon Interstate Commerce Commission 5B barrels, in normal proportion, which can be produced with existing equipment in whichever shift is run—an eight-, nine- or ten-hour shift.

An annual survey by the Census fixes the estimates for fabricated structural steel capacity on the basis of annual tonnage that could be produced if the plants were running full time, single shift, on the character and class of work usually secured.

The data for the textile industry are almost entirely on the basis of actual machinery activity performance in relation to estimated normal full-time operation. This approaches the capacity question from the angle of direct-time measurement of equipment utilization, rather than from the standpoint of output.

In the case of cotton-spindle activity, spindles active at any time during the month have been counted, though some have not been normally active during the whole month. The picture presented is therefore of actual idle equipment. There is a statistical series available for cotton-spindle activity in relation to single-shift operation, but this is of less value from the overcapacity viewpoint as some sections of this industry normally plan to operate more than one shift per twenty-four-hour day.

In the woolen section of the industry normal time has been taken as single-shift operation, which is in some cases considerably less than planned operation and hence causes the data to understate the idleness in relation to full-time capacity operation. Normal time in silk manufacture is considered as equal to the estimated usual time operated by each plant.

In the paper industry, the data for all sections except that of paper-board shipping boxes relate to production as compared with normal or "practical production" capacity. The basis for estimating this varies as between the items presented.

Normal capacities in the cases of newsprint, book paper and wrapping paper are based upon the actual average daily machine output during the best three-month period within the last five years. Production during the best three months may not, however, have been at full capacity from the viewpoint of possible output without overtaxing facilities.

The estimate for box-board capacity is the tonnage that could be produced if machines operated twenty-four hours per day for a five- or six-day week.

In the miscellaneous group, capacity operation for petroleum refineries is based on possible twenty-four-hour per day production for normal working days; in the case of wheat flour, it is also figured on twenty-four-hour per day operation for normal working days.

The capacity estimate for Portland cement is the possible production for each plant under full operation, with a continuous demand, adequate fuel supply and favorable labor and transportation conditions, with due allowance for ordinary and usual interruptions.

Furniture operations capacity for the Grand Rapids district has been taken as normal full-time, single-shift operation of the machine rooms, to which actual time operated has been compared.

Productive capacity for glass containers includes that of all furnaces and all equipment suitable for operation in normal shifts for usual working days in the month. That for illuminating glassware is the number of turns that could normally be run with existing equipment.

For the fresh-water pearl-button industry, the capacity estimate is based on the number of automatic machines in running order, to which the number in operation each week is compared. Shipments rather than production have been used as a basis of comparison in estimating normal capacity for each plant in the case of porcelain enameled flatware.

While the basis of estimation has varied rather widely, and the data are not strictly comparable, there is indicated a general situation of overcapacity that challenges attention and further study.