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## CHAPTER III

### THE ECONOMIC LOSSES CAUSED BY BUSINESS CYCLES

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NATIONAL BUREAU OF ECONOMIC RESEARCH

#### I. THE PROBLEM

The amount of energy it is wise to spend on efforts to control the business cycle depends upon the gains in national welfare which can be secured. The most definite of these prospective gains consists in diminishing the economic losses we now suffer from the wastes of booms, the forced liquidations of crises, and the involuntary idleness of depressions.

To measure these losses accurately is impossible. The chief difficulty is not lack of statistical data, though the data leave much to be desired, but the difficulty of deciding what effect the diminution of the present violent fluctuations would have upon the level about which the national income now oscillates. This problem must be faced before we can decide how to use what statistics we have.

First, it is clear that crises and depressions produce some salutary effects at present. They check foolish speculation, weed out incompetent business managers, give both employers and employees an incentive to greater efficiency, and stimulate the adoption of more economical methods of production.<sup>1</sup> Further, as Edwin F. Gay has recently pointed out, hard times have led to many transformations in economic organization.

The crises of 1857 and 1860 gave birth to the clearing-house [loan certificate] system. The reaction to the inflationist doctrine springing from the crises of '73 and '93 soundly educated the country to the need of a gold basis for our currency. The banking crisis of 1907 definitely brought to a head the movement for the development of central banking, which resulted in the Federal Reserve System. . . . The movement of population from the industrial East to the agricultural West has been stimulated in the past by each period of economic depression. . . . Mergers of industrial corporations, the cooperation of trade

<sup>1</sup> I think you admit too much. If business were kept running on an even keel, the incompetent would in time be weeded out and foolish speculations would be checked. Severe illnesses resulting from over eating have led many people to adopt salutary dietary rules. But the latter do not represent "improvements" or "advances." The people in question would be better off and more efficient if the excesses in question had not made remedies necessary.—Note by T. S. ADAMS.

associations and of trade unions have all grown through learning the need of closer cohesion from the lesson of adversity.<sup>1</sup>

While the specific changes here mentioned may be deemed either good or bad, it is evident that such remodeling of our social fabric is likely often to result in marked improvements.

Of course, all this does not mean that crises and depressions are blessings in disguise which we should be foolish to stop if we could. The economic changes cited by Mr. Gay mean rather that our predecessors have felt crises and depressions to be misfortunes and have taken measures which they hoped would prevent their recurrence. So far as these measures have succeeded, their success is an encouragement to further effort, and so far as they have failed, their failure means that the problem is still to be solved.

But the question remains whether the elimination of crises and depressions, could it be accomplished, might not leave the ill results of *prosperity* unchecked. Would not losses from rash investments, the indefinite survival of incompetent business managers, the relaxing of effort by employers and employees, and slowness in adopting technical improvements—would not these losses continue if production were stabilized, and would they not in the long run offset all the gains?

One answer to this query is that if the analysis in Chapter I is sound, the ill effects of prosperity just mentioned are among the factors which put an end to prosperity by breeding crises. In other words, methods of combatting crises and depressions which leave the wastes of prosperity unchecked will not prevent crises and depression from occurring. This answer is conclusive in a formal sense, though it serves to show how difficult it is to devise a plan of stabilizing business activity that will accomplish its aim. To succeed, the plan must be effective in preventing the wastes that now characterize booms as well as effective in relieving the sufferings of depressions.

A second problem that must be faced before the costs of business cycles can be estimated is suggested by what has just been said. If a successful plan of avoiding crises and depressions must avoid also the wastes of booms, would not that plan prevent production from reaching such high levels as have marked our busiest years? Would not the level of stabilized production be merely the level of a fairly prosperous year—the level of 1912, for example, rather than the level of 1916? Therefore, in estimating the gains theoretically attainable from perfect control over the business cycle, is it proper to use differences between production in the trough and production at the peak? Rather should not the production of every year be compared with the production attained in years of full employment without much overtime work, after this level

<sup>1</sup>The Next Great Inflation *Credit Monthly*, June, 1922.

has been adjusted to allow for the factor of growth? Indeed, should not the excess production of our busiest years above this "normal" level be subtracted from the deficient production of poor years to estimate the net loss from business cycles? And do not men unemployed in years of depression turn out many goods not represented in the statistics of production—garden products, home improvements, and the like?

No conclusive answer can be given to these questions, because we do not know what would happen if things were not as they are. But an offsetting series of questions comes to mind. Is the additional output of material goods produced by the intense exertion of boom years a national gain? Is it full compensation for the haste, the worry, and strain to which workers on overtime and harried business men are subject? Does not efficiency suffer in the long run from these strains and would not the general level of production rise if they were removed? Similarly, are not the ill effects of crises and depressions felt long after the hard times are over? Are not many adults made permanently less capable workers by the distress suffered and bad physiological or bad mental habits formed when out of their jobs for months at a time? And are not many children prevented from becoming as useful citizens as they might have become, had family incomes been regular?

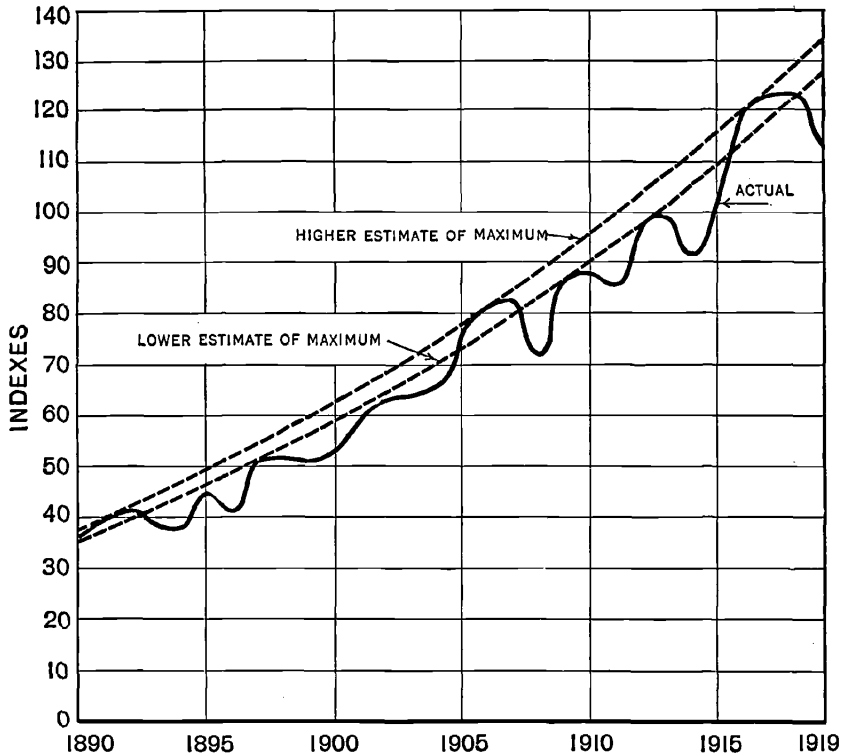
To repeat, the central difficulty of estimating the economic costs of business cycles is that we do not know with certainty what effect the removal of wide fluctuations in production would have upon national efficiency in the long run. Lacking such knowledge, all we can do is to show how far production in periods of depression falls below the records of boom years and how far it falls below the records of active but unhurried years. That is a technical problem in statistics for which the two solutions can be roughly approximated. But when the solutions have been found, we cannot prove that the higher or the lower figures are the better. Indeed, anyone who thinks that greater regularity of work and income would diminish efficiency may discount the lower figures, and the majority who hold the opposite opinion may add to the higher.

## II. ESTIMATES OF THE LOSSES BASED UPON INDEX NUMBERS OF PRODUCTION

At first thought, the easiest way of attacking the statistical problem seems to be to deal with it piecemeal, taking one industry at a time and analyzing the losses which are borne by property owners and employees or saddled by the industry upon the consumers of its products. Careful consideration, however, shows that this mode of attack is impracticable. It leads to insoluble problems of what profits and wages might have been in particular trades under conditions which have never prevailed; it involves interminable details and calls for data not to be had.

The only feasible method of approximating roughly the economic losses caused by business cycles is to deal with variations from year to year in the production or the income of the nation as a whole. These variations have been investigated of late by two groups of workers—those who have made index numbers of physical production, and those who have estimated the income of the nation in dollars. By using both sets of results it is possible to make two rough estimates of the differences

CHART 1.—INDEXES ILLUSTRATING HIGHER AND LOWER ESTIMATES OF MAXIMUM AS COMPARED WITH ACTUAL PHYSICAL PRODUCTION IN THE COMBINED FIELDS OF MINING, MANUFACTURING, AND TRANSPORTATION. 1890-1919.



between the economic yields of good and bad years and to check the results against each other.

Of the available index numbers of production, those made by Edmund E. Day and Walter W. Stewart are best adapted to the present purpose, in that they differentiate between the output of the farms, mines, factories, and railroads. This matter is important because agricultural production is affected more by the weather than by the business cycle; for example, 1914 was a year of large harvests and 1916 a year of poor yields. To include these erratic variations of the product of farms in an estimate of the economic losses caused by business cycles would

obscure what we wish to see clearly. Hence the following estimate is based upon an average of Stewart's and Day's index numbers for the

TABLE VIII.—POSSIBLE COMPARED WITH ACTUAL PHYSICAL PRODUCTION IN THE COMBINED FIELDS OF MINING, MANUFACTURING, AND TRANSPORTATION ACCORDING TO TWO DIFFERENT HYPOTHESES

A	B	C	D	E	F	G	H
Year	Actual physical production <sup>a</sup>	Higher estimate of maximum possible production	Higher estimate of loss occasioned by instability of production		Lower estimate of maximum probable production	Lower estimate of loss occasioned by instability of production	
			Amount C - B	Percentage of possible maximum (D + C) × 100		Amount F - B	Percentage of probable maximum (G + F) × 100
1890	36.4	37.3	0.9	2.4	35.1	-1.3	-3.7
1891	39.6	39.6	0.0	0.0	37.3	-2.3	-6.2
1892	41.1	41.9	0.8	2.0	39.4	-1.7	-4.3
1893	38.1	44.3	6.2	14.0	41.7	3.6	8.6
1894	37.9	46.8	8.9	19.0	44.0	6.1	13.9
1895	45.0	49.3	4.3	8.8	46.4	1.4	3.0
1896	41.1	51.8	10.7	20.7	48.7	7.6	15.6
1897	51.2	54.4	3.2	6.0	51.2	0.0	0.0
1898	51.9	57.1	5.2	9.1	53.7	1.8	3.3
1899	51.0	59.8	8.8	14.8	56.3	5.3	9.4
1900	52.5	62.6	10.1	16.2	58.9	6.4	10.9
1901	59.3	65.5	6.2	9.4	61.6	2.3	3.7
1902	63.3	68.5	5.2	7.6	64.5	1.2	1.9
1903	64.1	71.6	7.5	10.5	67.4	3.3	4.9
1904	66.0	74.8	8.8	11.7	70.4	4.4	6.2
1905	76.2	78.1	1.9	2.5	73.5	-2.7	-3.7
1906	81.5	81.5	0.0	0.0	76.7	-4.8	-6.3
1907	83.6	85.0	1.4	1.6	80.0	-3.6	-4.5
1908	72.8	88.6	15.8	17.8	83.4	10.6	12.7
1909	87.2	92.3	5.1	5.5	86.9	-0.3	-0.3
1910	88.8	96.1	7.3	7.6	90.4	1.6	1.8
1911	86.7	100.0	13.3	13.3	94.1	7.4	7.9
1912	97.5	104.0	6.5	6.2	97.9	0.4	0.4
1913	100.0	108.0	8.0	7.4	101.6	1.6	1.6
1914	92.2	112.1	19.9	17.8	105.5	13.3	12.6
1915	103.0	116.3	13.3	11.5	109.4	6.4	5.8
1916	120.6	120.0	0.0	0.0	113.5	-7.1	-6.3
1917	124.1	125.0	0.9	0.7	117.6	-6.5	-5.5
1918	125.4	129.5	4.1	3.1	121.9	-3.5	-2.9
1919	114.6	134.1	19.5	14.5	126.2	11.6	9.2
Total	2,192.7	2,396.5	203.8	8.5	2,255.2	62.5	2.8

<sup>a</sup> Combination of indexes derived by Edmund E. Day and Walter W. Stewart, see *An Index of Physical Volume of Production* (reprint from *The Review of Economic Statistics*, Sept., 1920-Jan., 1921), p. 65; and *An Index Number of Production*, *American Economic Review*, March, 1921, p. 68. Weights used, the same for the indexes in each study: mining 1, factories 7, and railways 2.

physical product turned out by mines, factories, and railroads. In averaging, these industrial groups have been assigned weights of one, seven, and two respectively. For the years preceding 1899 Stewart's index alone has been used, since Day's investigation does not extend back of that year. Column *B* of Table VIII presents the index of "actual physical production" made in this way.

To compare the actual output of each year with the output of the best years, a smoothed curve has been run through the peaks attained in 1891, 1906, and 1916. Had figures been available for the late '80's, a starting point for this curve might have been obtained higher than that given by 1891, which was not a boom year. Chart 1 shows the smoothed curve as well as the fluctuating line of actual performance. Readings from the smoothed curve on the chart supply the "higher estimate of maximum possible production" shown in Column *C* of the table.

When this estimate of the level that production might attain if business cycles were controlled is used as the basis for comparison, it appears that in one year (1896) the actual output was curtailed by more than 20 per cent. In twelve years out of the thirty the deficiency of production exceeded 10 per cent of what might have been attained. Taking the whole period, good and bad years together, actual production was 8.5 per cent less than the hypothetical maximum.

Next, to compare actual production with a hypothetical level based upon the output of active but unhurried years, a free hand curve has been run roughly through the records of 1897, 1909, and 1912. This curve also appears on the chart, and readings from it give the "lower estimate of maximum probable production" in Column *F* of the table.

In ten out of the thirty years covered, the actual output exceeded the "maximum probable production" estimated in this way, and these excesses appear as minus quantities in the "loss" Columns *G* and *H*. But in two-thirds of the years, production did not attain the level of such seasons of revival as are here made the standard of comparison. In five years the deficiency exceeded 10 per cent. Nor does the excess production of the good times balance the deficient production of the dull times; for, after subtracting the gains from the losses, there remains a net loss of nearly 3 per cent of the output of a whole generation of effort.

### III. ESTIMATE OF THE LOSSES BASED UPON THE TOTAL INCOME OF THE NATION

Figures showing annual fluctuations in the national income are better for the present purpose than index numbers of production in that they are not confined to a restricted field of industries. Furthermore, it seems probable that the production indexes fail to take sufficient account of approximately stable industries such as merchandising and the hand

trades, and that they stress the irregular output of raw materials too much and the relatively steady production of finished products too little. If these premises are true, the oscillations in industry as a whole may be somewhat less marked than the estimate based upon production indexes would lead us to believe. On the other hand, when we attempt to measure the variability in national productivity by the use of income statistics, we are confronted by other difficulties. The income of farmers, which is of course included, does not vary in harmony with the fluctuations in other industries. Data are available for ten years only—a period too brief to permit of measuring industrial trends with accuracy. And the necessity of reducing amounts expressed in dollars to a hypothetical money of constant purchasing power opens the door to new errors. Hence, the estimates about to be given are, perhaps, not superior to those already presented.

Table IX shows in Column *B* the estimates of the aggregate incomes of the people of the United States, prepared by the National Bureau of Economic Research, after the wild price fluctuations have been eliminated as well as may be. Since the period covered includes only one boom year (1916), it would be going very far to draw from these data a line showing production stabilized at the peak. But a line representing years of considerable activity is suggested by 1910 and 1913 though both were years of slowly receding business. Comparisons made between the amounts indicated by this line and the actual income, as estimated, give results corresponding to the smaller percentage losses obtained from the index numbers of production. The two sets of percentage losses differ somewhat, as is to be expected from the inclusion of farmers in one case and their exclusion in the other, yet the percentages run on about the same level, so that the one investigation confirms the other in a broad sense. The most marked differences in results occur in 1909 and 1918.

According to Table IX, the loss of income from depression in the one really bad year covered (1914), amounts to nearly 3,500,000,000 of pre-war dollars—or not quite a tenth of the national income. In seven years out of the ten the national income was below the level attained in periods of moderate activity. Could these figures be extended through 1921, they would probably show losses of greater magnitude.<sup>1</sup>

<sup>1</sup> To draw the line of "active production" through two years so close together as 1910 and 1913 seems to me too doubtful even for "rough estimates." That it results in erroneous conclusions is suggested to my mind by the loss of 5 per cent assigned to the year 1918. I can hardly believe that the latter year was so far below what might be called the "lower maximum." Contrast the percentage in Column *H* of Table X. Neither do I believe that 1915 was 7.4 per cent below the "lower maximum."—Note by T. S. ADAMS.



TABLE IX.—ROUGH ESTIMATE OF THE LOSS IN THE INCOME OF THE PEOPLE OF THE UNITED STATES FROM IRREGULARITY OF PRODUCTION IN THE YEARS 1909-1918 (Based upon a comparison of the income of each year, expressed in pre-war dollars, with the level of income attained in moderately active periods)

A	B	C	D	E
Year	Total income in millions of 1913 dollars <sup>a</sup>	Income assumed under stabilized conditions, in millions of 1913 dollars	Estimated losses from irregular production	
			In millions of 1913 dollars <i>C - B</i>	In percentages of assumed stabilized income $(D \div C) \times 100$
1909	\$ 30,101	\$ 31,365	\$1,264	4.0
1910	32,477	32,477		
1911	31,685	33,561	1,876	5.6
1912	33,730	34,584	854	2.5
1913	35,580	35,871	291	0.8
1914	33,595	37,064	3,469	9.4
1915	35,335	38,146	2,811	7.4
1916	41,265	39,132	-2,133	-5.5
1917	41,910	40,263	-1,647	-4.1
1918	39,112	41,192	2,080	5.0
Total	\$354,790	\$363,655	\$8,865	2.4

<sup>a</sup> "Income in the United States," vol. II, Table 20G (Publications of the National Bureau of Economic Research).

#### IV. CONCLUSION

All that the preceding tables are meant to show, and that in a very rough approximation, is the difference between the production of goods and income in years of depression and production in years of moderate and of intense activity. The broad result is that the worst years run something like 15 to 20 per cent behind the best, and something like 8 to 12 per cent behind the moderately good years. Even 10 per cent of the national income represents several billions of dollars.

Whether these figures indicate the order of magnitude of the material losses imposed on the country by business depressions is open to argument. Quite apart from objections based upon the imperfections of the statistical data that must be used in any estimate, it may be contended that a reduction of economic uncertainty would lead to a decline of efficiency. It may also be contended that both the strains of booms and

the sufferings of depressions impair efficiency more than uncertainty stimulates it. The latter is probably the commoner opinion. Those who accept this view will regard even the higher of the estimates here presented as understating the losses which plans for stabilizing production aim to check.

Finally, it is obvious that certain intangibles of grave concern to social welfare are omitted from our estimates and cannot be inserted later by any process of correction. Privation, anxiety, loss of self-respect—the concomitants of unemployment—are evils not measurable in dollars or percentages of physical production. To say that these evils reduce the amount of wealth produced in future years may be proper. But even so, that correction leaves out the saddest part of the reckoning—the part that cannot be put into figures.