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## INTERNATIONAL MONETARY FUND

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The Effect of Inventory Liquidation  
in the U.S. Business Recession

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Among the several causes of minor cycles in business activity, one of the most important is the change in inventory investment. Although quarterly changes in inventories are only a small fraction of total investment, they fluctuate so widely that they are generally greater than changes in total investment in producers' durable equipment and construction. Indeed, during the interwar period changes in inventory accumulation accounted for a larger fraction of the average change in gross national product during business cycle expansions and contractions than did any other form of investment.<sup>1/</sup>

The questions that naturally arise in 1958 are, first, to what extent is the decline in output due to disinvestment in inventories? And, second, when the liquidation of inventories ceases, how large will be the effect upon employment?

Relative Magnitude of Inventory Changes and Output

Chart I presents quarterly estimates of output and sales of nonfarm goods to final users. As in the case of the series on current dollar gross national product, the estimates are in terms of actual market prices. They thus include all costs of production, transportation, and distribution which are inherent in moving products to ultimate users or into inventories. The estimates cover final product only; raw materials and other intermediate goods and services

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<sup>1/</sup> For a detailed statistical analysis of this period, see Moses Abramovitz, Inventories and Business Cycles (National Bureau of Economic Research).

used up in the process of production are excluded, conforming to the general definition of gross national product. Thus the chart permits the tracing of the impact of changes in final demand, by making it possible to see how much of a given decline in production has been due to a decline in final sales, as against drawing down inventories.

In the past, every business contraction gradually has produced self-correcting forces which became stronger as the downswing progressed and eventually led to an upturn. As the contraction went on, production fell faster than sales, and inventories were liquidated. Inventories have usually continued to fall until business men considered that they had been brought into desired relationship with sales in the light of current short-term business expectations.<sup>1/</sup> The rate of decrease in inventories then began to diminish, and eventually liquidation came to an end. Even if inventories did not increase for some time, the levelling off in the rate of decrease was an inflationary factor.<sup>2/</sup>

Since the beginning of the current recession around August 1957 the correction in inventories has been substantial, and in comparison with the other two postwar recessions the liquidation of stocks has been far more severe. As can be seen from Table 1, the present decline in inventory investment is one third larger than the peak-to-trough decline in 1953-54, and

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<sup>1/</sup> Since business short-term expectations are continually changing, the ratio of inventories to total sales which businessmen regard as desirable is also continuously changing. Hence it is not valid to assume that there is a "normal" inventory-sales ratio for any extended period of time, and even less that this ratio will remain constant over an entire cycle. In fact the inventory-sales ratio moves inversely with the business cycle, rising during business contractions and falling during business expansions. (See for example, Survey of Current Business, April, 1949, pp.15,17, and May, 1958, p.7).

<sup>2/</sup> A given rate of inventory disinvestment represents a subtraction from total gross private investment. Hence when the rate of decline in stocks diminishes, there is a smaller offset to investment in producers' durable equipment and new construction. The resulting increase in total investment, working through the usual multiplier effect, leads to an increase in demand and, consequently, in employment.

CHART 1.

OUTPUT, SALES, AND CHANGES IN INVENTORIES OF NONFARM GOODS  
(SEASONALLY ADJUSTED QUARTERLY TOTALS AT ANNUAL RATES)

Dollars (Billions)

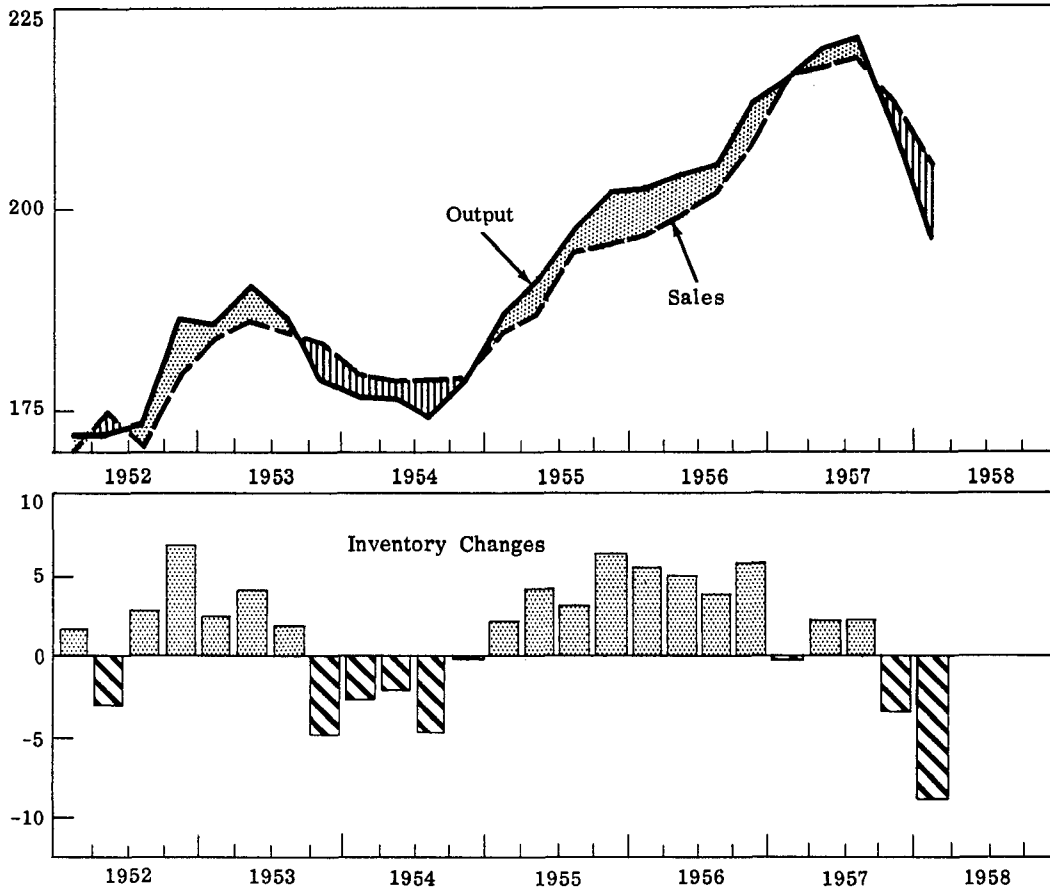
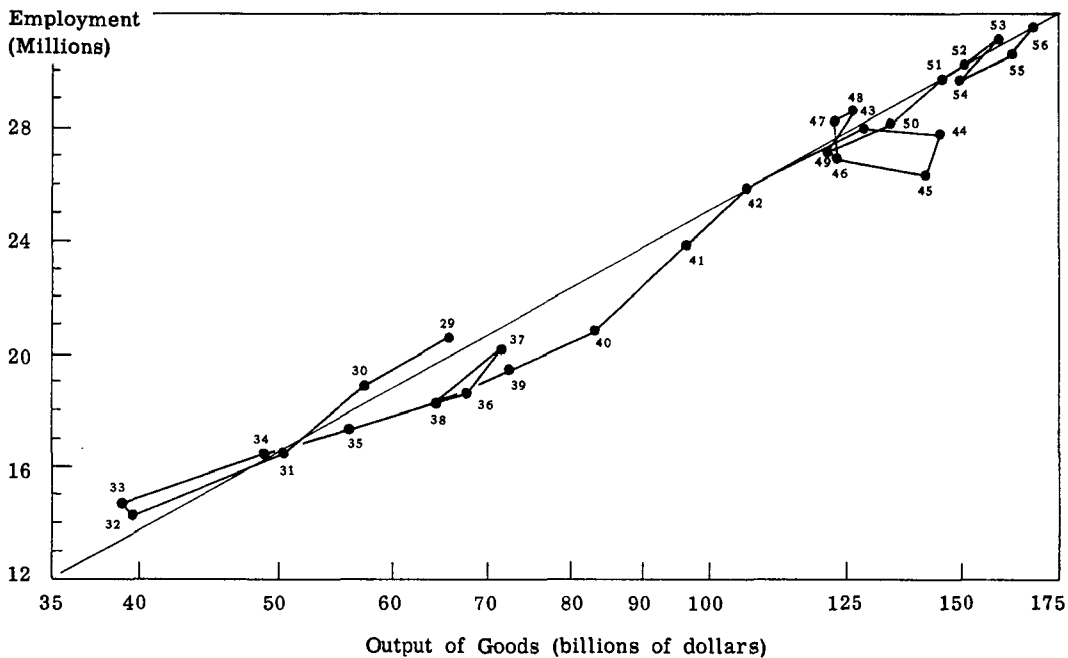


CHART 2. RELATION OF EMPLOYMENT TO OUTPUT OF GOODS <sup>1/</sup>



<sup>1/</sup> Full time-equivalent employees in nonservice, nonfarm industries;  
output of nonfarm goods in constant (1947) dollars, excluding construction.  
Average line of relationship, based on years 1929-1941 and 1946-1956,  
is  $E = 28.31 \log O - 31.8$ .



Table 1. Changes in Components of Gross Private Domestic Investment

(In billions of dollars, seasonally adjusted annual rates)

	Changes between quarters <sup>1/</sup>		
	1948 IV - 1949 IV	1953 III - 1954 III	1957 III - 1958 I
Nonfarm inventory dis- investment	-8.7	-6.6	-11.1
Investment in producers' durable equipment	-2.6	-2.2	-3.0
New construction	40.6	42.5	40.3

<sup>1/</sup> The quarters shown are cyclical turning points except 1958 I.

Source: U.S. Department of Commerce.

two thirds larger than the comparable decline in 1948-49. About 46 per cent of the decline in output from the third quarter of 1957 through the first quarter of 1958 is attributable to the decline in inventories, while the other 54 per cent of the fall in output is due to the decline in sales.<sup>1/</sup>

These declines in inventory investment have been larger than the decline in investment in producers' durable equipment. Thus, between the fourth quarter of 1948 and the fourth quarter of 1949, investment in producers' durable equipment fell \$2.6 billion, whereas the decline in nonfarm inventories was \$8.7 billion. Similarly, in the 1953-54 recession inventory disinvestment was several times larger than the decline in investment in producers' durable equipment. The present recession has been no exception. As can be seen in Table 1, the decline in inventories has again followed the

<sup>1/</sup> It should be noted that the proportion of the decline in output attributable to inventory disinvestment contrasts sharply with the more usual comparison between total inventory disinvestment and the decline in gross national product. Since the third quarter of 1957, gross national product has fallen by \$18.0 billion, and total inventories declined \$12 billion. Consequently, the decline in inventories represents 66 per cent of the decline in gross national product, in contrast to only 46 per cent of the decline in the output of goods. The reason for this disparity is that nonfarm output of goods has declined much more than gross national product, reflecting the fact that the service, construction, and farm components of gross national product continued to rise.

historical pattern showing wide fluctuations. From the peak in the third quarter of 1957 to the first quarter of 1958, nonfarm inventories declined by \$11.1 billion. In contrast to this sharp decline in inventories, investment in producers' durable equipment has fallen by only \$3.0 billion during the same period, and construction--both residential and industrial--increased slightly by one third of a billion dollars.

In the 1953-54 recession the excessive accumulation of stocks had been worked off by the end of the year, and liquidation was reduced to \$0.1 billion in the fourth quarter of 1954. As the rate of liquidation diminished, output rose. At present there does not appear to be any evidence that previous excesses in the accumulation of stocks have been worked off, so that it seems too early to predict that inventory disinvestment will slacken off in the near future.<sup>1/</sup>

#### Effect upon Employment

When and as inventory liquidation ceases, output can be expected to rise by \$8.8 billion (annual rate)--provided, of course, that other forms of investment or consumption do not fall further to offset the improvement in inventories. As shown in Chart 2, there is close relationship between deflated output of goods and the number of full-time equivalent employees.<sup>2/</sup> It can be estimated from this relationship that an increase in output of \$8.8

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<sup>1/</sup> The latest data for April, 1958 show a continued decline in the book value of seasonally adjusted manufacturing inventories, but manufacturers' new orders--a series that leads sales--have also continued to decline. New orders were at a seasonally adjusted rate of \$77.3 in the fourth quarter of 1957 and fell to a seasonally adjusted rate of \$73.3 billion in the first quarter of 1958; in April new orders declined further to a seasonally adjusted quarterly rate of \$72.6 billion. Moreover, sales declines have continued to be sharper than cuts in inventories, and in April inventory-sales ratios increased to above those recorded at the beginning of the year.

<sup>2/</sup> Full-time equivalent employment measures man-years of full time employment among wage and salary earners, and its equivalent in work performed by part time workers. See Survey of Current Business, June 1945, pp.17-18.

billion would raise employment in the nonfarm nonservice industries by roughly 570,000 workers.<sup>1/</sup> This in turn would be sufficient to reduce total unemployment from its first quarter average level by approximately 13 per cent.

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<sup>1/</sup> Note that the \$8.8 billion increase in output is in current prices. Consequently, this figure cannot be used directly in computing the rise in employment due to a rise in output from the relationship in Chart 2, but must be deflated by the appropriate price index. The resulting employment estimate obtained must then be adjusted to convert from full-time equivalent employment to the usual definition of employment which includes also part-time employment.