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Remarks by

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This afternoon I'd like to focus on some of the major factors that are driving industrial activity in the United States. First, I plan to spend some time outlining what I believe to be the key forces that seem to have damped the inventory cycle in recent years Then, I'd like to move toward a different level of stock or inventory appraisal, and an evaluation of the overall demand for long-lived goods. Inventories or ownership of these types of goods interact with material inventory fluctuations to create a major element of underlying demand for industrial products. And, finally, I'll close with a few observations on the effects of the changing structure of imports and exports on industrial activity

After a brisk expansion through 1988 and the first quarter of 1989, the American economy began to behave like a tire with a slow leak The economy's momentum began to fade and the typical prerecession symptoms became progressively manifest.

By autumn, increasingly negative signals on the economic outlook started to develop The emerging weakness in manufacturing, especially in the durable goods sector, seemed to be cumulating and prospectively spreading to the nonmanufacturing areas of the economy

In the event, however, the weakness in industrial activity bottomed around the turn of the year And, although the performance since can scarcely be described as robust, it nonetheless has markedly assuaged the concerns that recessionary forces were mounting for the American economy as a whole

The obvious question is, what went wrong with the recession forecasts or, more exactly, what went right with the economy? While

analysts can never be certain of such things, there is at least presumptive evidence that a major reason, perhaps the key reason, is the marked change in inventory behavior on the part of purchasing managers in manufacturing and elsewhere

Most, if not all, past American recessions have been sparked, or at least aggravated, by large inventory swings Purchasing managers, seeking to protect their production schedules, accelerated inventory accumulation as their suppliers' delivery lead times stretched out during periods of diminishing excess capacity But the process of heavy buying put increasing pressure on suppliers' capacity, inducing still further lead- time extensions, which inevitably required still further increases in days' supply of inventories of materials on hand This cycle generally led to inventories being built up at unsustainable rates, or to excessive levels often accompanied by strained corporate balance sheets

Purchasing managers would then reduce forward orders to match, rather than exceed, prospective levels of materials consumption. Suppliers were then able to cut back on frenetic production levels which, in turn, set into motion declines in lead times promised to prospective customers and allowed those customers to reduce the days' supply of inventory required to protect their productions schedules That, not surprisingly, led to a still lesser flow of orders, lower production, and still shorter lead times In short, I am outlining the classic inventory cycle. That cycle, which has been a key element in American business history, obviously has not been evident on the industrial scene in recent years The historical sequence apparently

has been broken, enabling purchasing managers to meet their production schedules throughout the expansion of the 1980s without the historic runup in lead times, accumulation of inventory, and its inevitable liquidation. Several explanations of the change suggest themselves.

First, but not necessarily the most important, has been the dramatic expansion of real-time inventory monitoring. The expansion of computer technology and rapidly decreasing costs of telecommunications has enabled management to become quickly informed of inventory patterns, by product and stage of processing, within a corporate complex and, to an increasing extent, beyond the factory gates to stocks in the hands of distributors and customers. This has fostered a reduction in uncertainty in inventory scheduling, which historically had probably led business to hold larger safety stocks than were otherwise required. Implicit in this trend has been increasing sophistication in transportation scheduling of the movement of goods and materials between plants and between production facilities and customers.

Another factor reducing uncertainties of product availability has been the broadening tendency of customers to provide suppliers in recent years with projected requirements well into the future. Moreover, sophisticated production techniques have improved quality reliability so that "just in time" deliveries would be associated with a lower reject rate and, consequently, a lower required safety buffer than had earlier been the case.

Second, in part because of the increased "downsizing" of the spectrum of products produced by the world's industries, goods, in recent years, generally have become easier to move internationally.

Thus, the ability of customers in the United States to draw on foreign facilities when domestic supplies become tight has kept average lead times on deliveries from accelerating as excess capacity began to disappear at our plants

As a consequence, it is not surprising that average delivery lead times for production materials, as reflected in your surveys, have remained at levels that in the past would have been consistent only with periods of substantial slack in domestic production facilities

One indication of the success of inventory management techniques and tighter controls is that the proportion of materials and supplies in total manufacturing inventories has trended down since the late 1970s Moreover, typical nationwide inventory-sales ratios, which we employ to measure the degree of potential inventory deficiency or excess, are becoming increasingly skewed by imported goods that find their way into our inventory system For example, we estimate that the proportion of wholesale and retail trade inventories (marked down to factory gate values), which are foreign sourced, has risen from less than 20 percent in the early 1980s to around 25 percent currently While heavy buildups of inventories of imported goods can precipitate cutbacks in domestic production, it seems likely that a large part of that adjustment falls on foreign facilities rather than domestic, although obviously there are a number of products for which there are multiple supply sources, both domestic and foreign

One must assume that, with delivery lead times relatively short now for a number of years, the transition process to "just in time" and other inventory slimming control measures must soon be reaching a

plateau But hopefully not That issue, of course, is certainly far more in your hands than in the hands of the rest of us involved in production or finance

Does all of this suggest that we've beaten the inventory cycle and, perhaps, the business cycle, as well? The immediate answer is, not likely Historically, inventory cycles were precipitated by a perceived shrinking of excess domestic production capacity or potential commodity price increases for production and maintenance materials It is perfectly rational for a purchasing manager to attempt to accumulate inventories, in terms of days' supply, as some function of the time it takes the manager to obtain additional materials from his suppliers If worldwide stringencies in the production system were to occur, for example, and lead times, accordingly, were to stretch out, reasonable inventory management could still readily imitate the type of inventory accumulation and liquidation cycles that have plagued us in the past One, of course, would be hard pressed to find such indications in our current materials supply/demand balances Nonetheless, we should not presume that the extraordinary changes that have occurred in inventory management in recent years have fundamentally altered inventory purchasing patterns in a manner that will eliminate, henceforth, any concerns we may have of inventory excess and inventory induced recessions. Nor should it be necessary to add, there are many reasons for business cycle fluctuations other than inventory movements Although inventory excesses often trigger production cutbacks and generally exacerbate cyclical change, they can be far less important in

governing the amplitude and extent of business cycles than fluctuations in capital goods markets or residential construction, for example

In fact, the broader forces of fluctuations in demand for products reflects a different type of inventory analysis, one looking at the ownership of, for example, cars and trucks on the road, the stock of residential buildings, the stock of office buildings, or the stock of capital equipment In short, the physical parts of the balance sheet of the American economy can be viewed as inventories in a certain larger sense The notions of deficiency and excess in such items affect the demand for goods and services and the levels of economic activity in ways not all that distinct from conventional inventories, although, granted, the time cycle is appreciably longer

Indeed, while materials inventories have exhibited little downward pressure on economic activity of late, on balance the overhang of stocks of long-lived physical assets is likely to be a restraint on growth in the period ahead A fundamental characteristic of such items is that the demand for them is shaped, in part, by the size of the outstanding stocks relative to current household and business needs Viewed in this light, the slowing in economic growth last year represented, at least to an extent, a pause in the pace of accumulation of physical assets so that levels of ownership would not get too far out of line with the long-term desired levels In a sense it represented a form of inventory correction

Because of their importance in understanding the recent economic situation, it is worth examining some of these stock adjustment relationships in detail Motor vehicles are key items among these

durable assets Auto assemblies in the first quarter were at a 5-1/2 million unit seasonally adjusted annual rate, well below the 7 million unit rate over 1989 as a whole, as a result of soft demand and rising dealer inventories last fall However, reflecting the liberal use of incentive programs, sales have picked up since the turn of the year, which, combined with the cut in assemblies, has reduced dealer inventories to more acceptable levels, and automakers recently have stepped up production

Looking beneath these short-run variations in sales, production, and dealer inventories, however, current and prospective developments in the auto market reflect, in part, longer-range demand factors, such as the existing number of motor vehicles owned per household and the average age of the auto and truck stocks Between 1979 and 1983, for example, the number of vehicles per household--which had been on a strong uptrend throughout the postwar period--fell nearly 3 percent A decline of 3 percent may not sound very large until you consider that it represented a shortfall on the order of 10 million cars and trucks between the actual stock of motor vehicles and the underlying trend stock. This decline in the per household ownership of motor vehicles was likely a result of consumer reaction to the relative increase in gasoline prices and the downturn in economic activity that occurred during the period Also, during the late 1970s and early 1980s consumers slowed the pace at which they scrapped their existing cars and light trucks, the combination of lower scrappage and the lower sales of new vehicles lengthened the average age of both the autos and trucks on the road by approximately one year to over 7 years

The combination of an enormous pent-up demand--reflecting the gap between actual and trend levels of ownership--as well as increased replacement needs associated with an aging auto stock provided the stimulus for the extraordinarily strong pace of auto sales posted from 1983 through much of the remainder of the decade This rebuilding of the motor vehicle stock suggests that the number of autos owned by households and businesses is now adequate to meet much of the desired demand for transportation equipment, and sales are at this point likely to reflect primarily replacement needs and decelerating growth in the driving-age population.

In the housing market, longer-run demographic factors are also having a subduing effect on the underlying stock demand--especially the rate of household formation This rate has been slowing and will slow further as more and more of the low birth cohort of the 1960s and 1970s matures into adulthood What this means, of course, is that what constitutes "normal" levels of homebuilding activity during the 1990s will tend to be lower than it was in the 1980s

How the broad decade averages of demand get distributed from year to year depends in large part on financial conditions Interest rates on home mortgages have increased since the turn of the year, and, from the homebuyer's perspective, financial considerations have become at least somewhat less favorable In recent months, however, segments of the construction industry have reported difficulty in obtaining credit in the wake of newly imposed restrictions on lending by thrift institutions. Some added lender caution in acquisition, development, and construction lending has emerged, given the riskiness of this

activity, but the difficulties now being experienced by builders should diminish considerably over time as they secure other financing sources for their creditworthy projects

In the case of nonresidential structures, there are indications of serious excesses in a number of areas, with vacancy rates for office space in most metropolitan areas at near-record levels Moreover, lending institutions--stung by a long series of retrospectively dubious investments--are more carefully scrutinizing loan applications than in the past, so that highly risky projects are not getting funded as readily. Reflecting these developments, nonresidential building permits have turned down and new construction spending has been stagnant over the past year in all major sectors except industrial building

Business demands for new equipment also reflect, to a large degree, stock-adjustment motives Business spending for a number of types of capital equipment has softened noticeably since the middle of last year, reflecting a general slowdown in economic activity and expected sales Looking forward, recent data tend to suggest that capital spending this year will grow less than in 1988 and 1989 For example, surveys of plant and equipment expenditures indicate that real capital spending will grow more slowly this year, although the most recent survey of 1990 spending plans was somewhat more positive than earlier ones In any event, demand for long-lived assets is still growing in some areas, creating opportunities for moderate production growth This is most clearly evident in the case of civilian aircraft for which the level of the orders backlog has doubled over the past two years

Finally, I would like to employ the remaining minutes allotted to me to focus on the prospective impact of foreign trade as a key addition to the two inventory elements of demand for industrial goods discussed so far We estimate that during 1987 and 1988 foreign demand for American goods accounted for close to a third of the growth in domestic output of manufactured goods Although real exports of manufactured goods posted another increase in 1989, the gain was appreciably less than the torrid pace registered during the previous two years Indeed, the deceleration in export growth contributed to about half of last year's softening in factory output

It is the case that exports of a few industries, for example, chemicals, electrical machinery, and aircraft, continued to grow in 1989 at a rate equal to or better than their pace during the two previous years However, a number of manufacturing industries experienced a noticeable slackening in export growth last year, and in some industries real exports actually declined Special factors may have held down production and exports of some types of goods last year For example, there have been reports that lumber production was reduced, owing to restrictions on logging in the Pacific Northwest On the other hand, capacity constraints--which reportedly restrained export growth in some industries in 1988--were much less pervasive last year.

On the import side, we estimate that the share of domestic absorption of manufactured goods supplied by foreign-based firms has been essentially flat at about 16 percent since 1986, after having risen considerably earlier in the 1980s It is noteworthy that this share did not decline, even in 1987 and 1988, when the export share was rising

The fact that import penetration has not turned down may be an indication of how strongly foreign producers resist losing a share of the vast US market, even when exchange rate movements are unfavorable to them

Nonetheless, it appears that in recent months the volume of imports of merchandise excluding oil actually has declined In part, this may be related to inventory corrections that have occurred recently in a number of sectors, especially among department stores. Imports account for a significant portion of the goods sold at these stores Consequently, when inventories are high relative to sales--as was the case in the retail sector late last year--as I indicated earlier, foreign-based suppliers share in the ensuing production adjustment

In conclusion, the risks of a sharp or prolonged decline in manufacturing output clearly have abated since last autumn, owing, in part, to prompt inventory adjustments fostered by improved inventory control procedures However, of the underlying determinants of demand for manufacturing goods, stock level demands by households and businesses for long-lived assets is likely to be restraining while foreign demand for US goods should be positive--albeit less so than, say, in 1987 and 1988 Overall, these indicators point to somewhere between modest and moderate growth in factory output over the coming year

The actual outcome, of course, will depend on the broader financial and other economic forces driving the total American economy And these forces, in turn, are likely to be significantly shaped by the increasingly relevant global economic environment However the

industrial economy develops in the years ahead, I suspect that members of the National Association of Purchasing Management will play a key role in its evolution