

# New Economy, New Recession?

The National Bureau of Economic Research (NBER) confirmed in November 2001 what many had long suspected—that the U.S. economy was in recession and had been since March 2001. Thus ended an economic expansion that had begun in March 1991, the longest in the NBER chronology that dates to the mid-1800s. During this expansion, many economists and policy analysts talked about a “New Economy” characterized by a higher sustained level of productivity growth brought on by new networking and information-sharing technologies.

What does the New Economy’s new recession look like? This article examines the 2001 recession by comparing it with previous recessions and investigating whether an added degree of resilience and flexibility is evident in the economy. The downturn appears to have been relatively mild and to have been tempered by the productive use of information technologies. Paradoxically, the information technology sector itself was hit exceptionally hard.

## What Is a Recession?

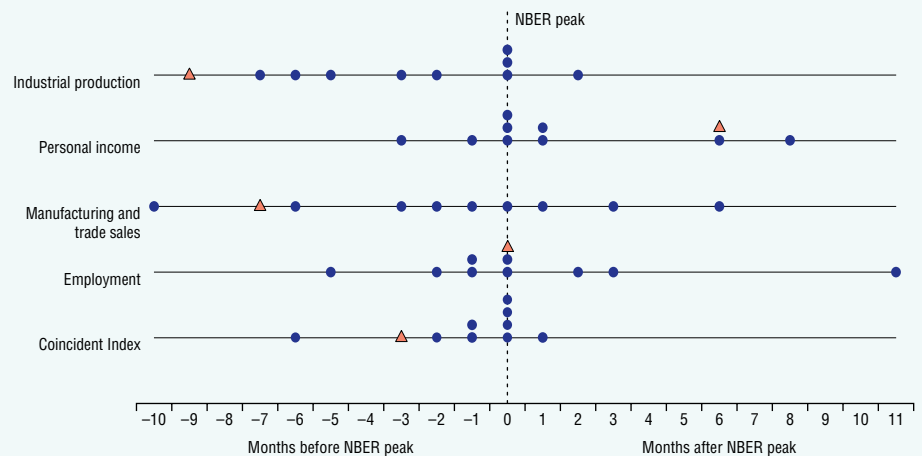
The NBER’s Business Cycle Dating Committee is the official arbiter of the dates that mark the onset of expansions and contractions in U.S. economic activity—business-cycle troughs and peaks. The NBER does not employ the media’s rule of thumb that a recession occurs when gross domestic product (GDP) falls for at least two consecutive quarters. Rather it defines a recession as “a significant decline in activity spread across the economy, lasting more than a few months, visible in industrial production, employment, real income and wholesale-retail sales.” This definition makes it clear that the depth, breadth and duration of a downturn are key to determining whether it will be classified as a recession.

## Anatomy of a Recession

Chart 1 shows the timing of the cyclical peaks in the NBER’s four coincident indicators and the Conference

Chart 1

### “Coincident” Indicators Don’t Always Move Together



SOURCES: Victor Zarnowitz (2002), “The Coincident Indicators in the Current Slowdown and Recession,” *Business Cycle Indicators*, The Conference Board, vol. 7, no. 1 (January), pp. 3–4; authors’ calculations.

Board’s composite Coincident Index (which is an average of the NBER indicators) relative to the official business-cycle peaks designated by the NBER. A dot to the left of 0 means the indicator peaked before the NBER peak, and a dot to the right of 0 means the indicator peaked after the NBER peak. Each triangle distinguishes the indicator’s most recent cyclical peak. The data cover the period from 1948 through 2001.

The chart illustrates that peaks in

particular indicators often don’t correspond well with the NBER’s business-cycle peak, with discrepancies as large as 11 months. The Coincident Index matches the NBER peaks most closely but not perfectly. Clearly, the dating of business-cycle peaks involves a good deal of judgment, and there is room for reasonable people to disagree.

Because the indicators peak and trough at different times, Table 1 examines the length and depth of the de-

Table 1

### Length and Depth of Declines in the NBER Indicators and Coincident Index

	Length of decline (months)			Depth of decline (percent)		
	Most recent recession	Past recessions Mean	Past recessions Range	Most recent recession	Past recessions Mean	Past recessions Range
Industrial production	18	13	6–17	7.1	9.5	4.6–14.9
Personal income	1	8	2–17	.8	2.5	1.0–5.7
Manufacturing and trade sales	13	14	5–23	4.1	8.0	5.1–12.9
Employment	10	12	4–20	1.1	2.9	1.4–5.2
Coincident Index	11	11	6–16	1.0	3.2	2.0–5.9

SOURCES: Federal Reserve Board; Bureau of Labor Statistics; Bureau of Economic Analysis; The Conference Board.

*The evidence suggests that the most recent recession was unusually mild.*

clines in each indicator relative to its own cyclical peak. For instance, industrial production fell by 7.1 percent from its most recent cyclical peak. Its 18-month contraction was the longest in the post-World War II period. Yet, the decline was smaller than the average 9.5 percent drop and, indeed, was one of the shallowest on record. For the other series, the table shows their declines were shorter in duration than average, and in each case the slide was less than *all* of the previous decreases.

In summary, the evidence suggests that the most recent recession was unusually mild. As we shall see, this result is consistent with a broader trend toward smaller fluctuations in output growth in recent years.

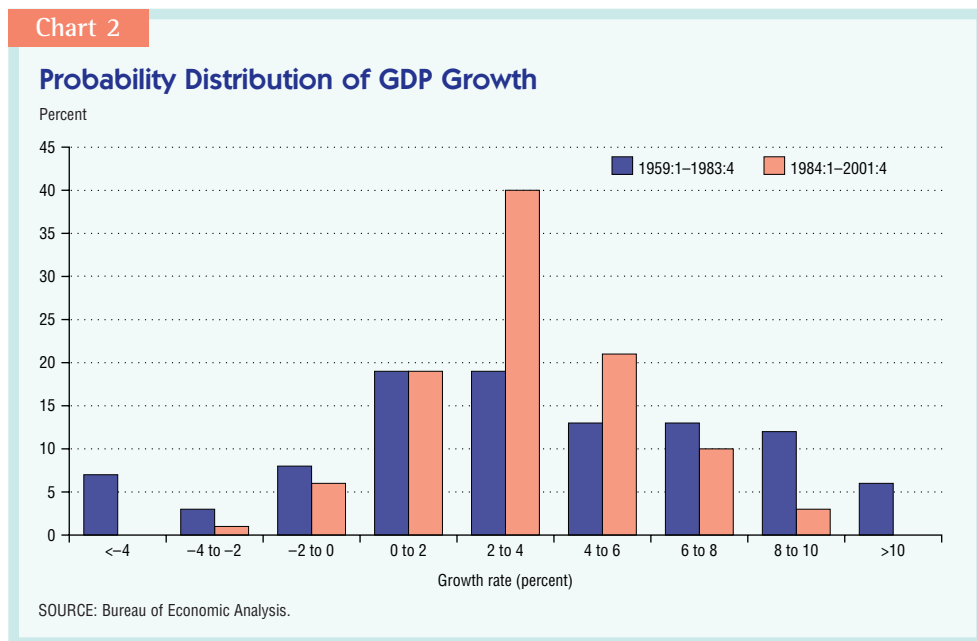
### A More Stable Economy

Chart 2 shows the distribution of quarterly GDP (annualized) growth over two different periods: 1959–1983 and 1984–2001. The mean GDP growth rate differs little between the periods—it is 3.6 percent during the early period and 3.2 percent during the latter period—but the standard deviation of growth falls almost in half, from 4.5 percentage points to 2.3 percentage points.<sup>1</sup> In particular, extreme movements in output—growth rates below –4 percent and above +10 percent—are much less likely today than 20 or 30 years ago. Obviously, declines

in GDP are also less likely than before. GDP declined in 18 percent of the quarters prior to 1984 but in only 7 percent of the quarters since then.

Understanding why output growth has become more stable will help us understand why recessions have become less frequent and less severe. We start by identifying the components of GDP responsible for the economy’s greater stability. Besides yielding clues to underlying economic causes of the economy’s improved performance, this exercise will help us determine in what respects the most recent economic slowdown has been unusual.

The impact of volatility in a particular sector on GDP volatility depends on two factors. It depends, first, on how large the sector is relative to the economy as a whole. Variation in the demand for cars is more important for GDP volatility than is variation in the demand for rubber bathtub stoppers. Second, the impact depends on the correlation between that sector’s (size-weighted) growth rate and growth in GDP. A sector that is strong when the rest of the economy is weak (whose growth is negatively correlated with GDP growth) tends to smooth out fluctuations in the aggregate economy. The more variable the growth is in this sector, the better. On the other hand, volatility within a sector whose growth is *positively* correlated with growth in the rest of the economy is destabilizing.



More generally, a sector's contribution to GDP growth variability equals the variability in that sector's size-weighted growth rate multiplied by the correlation coefficient between sector growth and GDP growth.<sup>2</sup>

Columns 1 and 2 in Table 2 show different sectors' contributions to the variability of GDP growth during the pre-1984 and post-1983 periods, respectively. Columns 3 and 4 compare these contributions across time periods. For example, consumption growth—because of reduced volatility and lower correlation with GDP growth—has subtracted 0.82 percentage points from the standard deviation of GDP growth, which is 37 percent of the total decline in GDP growth volatility. Similarly, the investment sector accounts for 1.47 percentage points, or 67 percent, of the decline in GDP growth variability. Growth in government purchases has had little net effect on GDP growth volatility. Net exports' size-weighted growth rate has become both less variable and less strongly correlated with GDP growth, which is destabilizing since net exports tend to move opposite to GDP. So, net exports have actually *added* 0.11 percentage points to the variability of GDP growth. Globalization has not—so far at least—helped insulate U.S. production from swings in domestic demand.

### Sources of Stability

Three spending categories stand out as major contributors to the economy's greater stability since 1984: inventory investment, consumer durables and residential investment. Together, these three sectors account for 83 percent of the total reduction in GDP growth variability, with 41 percent coming from inventory investment alone. Having isolated these three components of GDP that appear most responsible for the economy's greater stability, we now put forward some (admittedly speculative) ideas about the underlying causes. As we discuss below, it appears that financial deregulation and tighter inventory control contributed a great deal to the economy's increased stability. However, other explanations that are not mutually exclusive are possible as well, such as better monetary policy and smaller food and energy supply shocks.<sup>3</sup>

Table 2

### Why Is the Economy More Stable?

*Contributions to GDP growth variability before and after 1984*

Sector	Contribution to variability of GDP growth		Change in variability contribution	Percent of fall in GDP growth variability accounted for
	1959:1–1983:4	1984:1–2001:4		
<b>Consumption</b>	<b>1.51</b>	<b>.68</b>	<b>-.82</b>	<b>37</b>
Durables	.83	.29	-.54	25
Nondurables	.41	.23	-.18	8
Services	.26	.16	-.10	5
<b>Investment</b>	<b>3.02</b>	<b>1.55</b>	<b>-1.47</b>	<b>67</b>
Nonresidential fixed	.70	.49	-.21	10
Residential	.58	.21	-.37	17
Inventory	1.74	.85	-.89	41
<b>Government</b>	<b>.22</b>	<b>.19</b>	<b>-.03</b>	<b>1</b>
<b>Net exports</b>	<b>-.27</b>	<b>-.16</b>	<b>.11</b>	<b>-5</b>
<b>Total</b>	<b>4.47</b>	<b>2.28</b>	<b>-2.21</b>	<b>100</b>
(standard deviation of GDP growth, percentage points)				

NOTE: Numbers may not total due to rounding.

**Residential Construction.** The contribution of residential investment to the economy's increased stability arises almost entirely from its reduced variability rather than from any change in its correlation with GDP growth. This reduced variability likely results from the elimination of bank deposit interest-rate ceilings (which helps stabilize the supply of funds available for home loans), from the increased availability of variable-rate mortgages (which makes housing more affordable when interest rates on fixed-rate mortgages are high) and from technical advances in construction.

**Consumer Durables.** The contribution to economic stability from the consumer durables sector at least partly reflects wider access to consumer credit (through credit cards and home-equity loans, for example), allowing households to better maintain their spending on big-ticket items in the face of short-term income fluctuations. In turn, expanded access to consumer credit (especially unsecured credit) is partly due to the improved information-storage and information-processing technologies available to financial institutions. Finally, the steadier funding available to financial institutions since the elimination of deposit interest-rate ceilings (Regulation Q) may help maintain consumer loan availability

over the business cycle just as it helps stabilize mortgage lending.

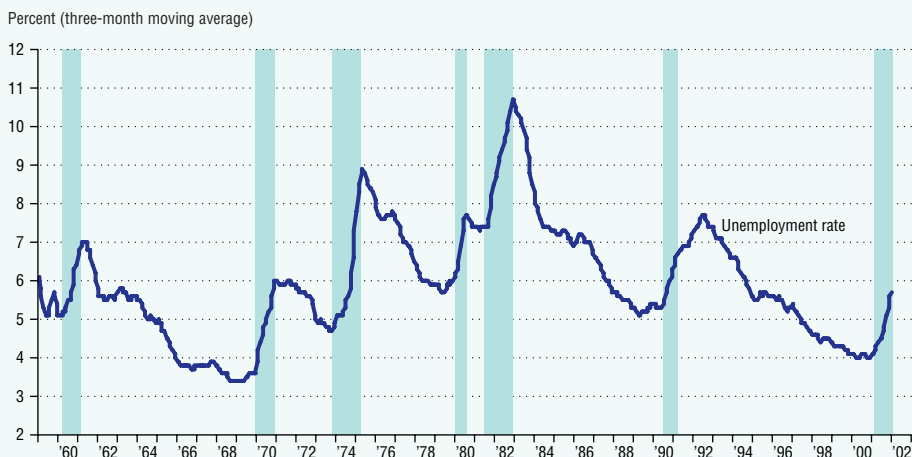
**Inventory.** What of inventory investment? New Economy technologies have provided tremendous opportunities to streamline industry supply chains and reduce reliance on inventory buffers. Moreover, decisionmakers at all points along the supply chain can use real-time information systems to quickly limit imbalances between demand and production. The inventory-to-shipments ratio for all manufacturing industries has fallen from an average 1.74 in the 1959–83 period to 1.54 in the 1984–2001 period. Moreover, the ratio, which averaged 1.80 during the past six NBER-defined recessions, was only 1.33 in January 2002.

Unfortunately, cause and effect are difficult to disentangle. Is inventory investment growth more stable because of new technologies and improved practices, or has an economy that is more stable for other reasons (such as monetary policy or good luck) simply made it easier to forecast future sales? Is consumer durables growth more stable because of a better-functioning consumer credit market or because a more stable economy smooths growth in household incomes, reducing the need for occasional sharp cutbacks in purchases of big-ticket items?

Chart 3

### Slow Growth as Evidenced by a Rising Unemployment Rate

*Slowdowns start earlier and sometimes last longer than NBER recessions.*



NOTE: Bars indicate NBER-defined recessions.  
SOURCE: Bureau of Labor Statistics.

### How Does the Current Slowdown Measure Up?

We began this article by comparing the timing, depth and duration of absolute cyclical declines in the NBER's monthly indicators. The mainstream academic approach to business-cycle analysis focuses, instead, on *fluctuations around trend growth*. It looks at periods during which the economy is growing at substantially less than its trend rate. These growth slowdowns correspond more closely to the public's perception of bad economic times than do NBER recessions, because periods of below-trend growth are also typically periods of rising un-

employment. Indeed, a simple way to identify growth slowdowns is to look for periods of sustained increase in the unemployment rate.

As shown in Chart 3, the practical difference between a growth slowdown and an outright NBER-style recession is one of timing. Every NBER recession is associated with a substantial rise in the unemployment rate, and every substantial rise in the unemployment rate is associated with an NBER recession. But the unemployment rate often begins rising before NBER peaks and sometimes (most notably in 1991–92) continues to rise after NBER troughs.<sup>4</sup>

Using the unemployment rate to identify periods of below-trend growth, Table 3 compares the recent slowdown with past slowdowns. For GDP and its major components, the table gives (1) the average contribution to GDP growth from 1959:1 through 2001:4, (2) the mean and range of contributions to GDP growth during the first four quarters of the six prior slowdowns, and (3) the contribution to GDP growth during the first four quarters of the most recent slowdown (2000:4 through 2001:4). For example, the first column of the table shows that GDP rose 3.4 percent per year, on average, over the past 43 years; that it declined by an average of 1.3 percent during the first year of cyclical slowdowns (with a range from –2.9 to 0.2 percent); and that during the first year of the most recent slowdown, GDP rose by 0.4 percent—above the upper end of the historical range. This last finding is consistent with evidence that GDP growth fluctuations have generally diminished.

The second column of Table 3 shows that consumption's contribution to GDP growth (2.1 percentage points) was exceptionally large during the most recent slowdown. Much of the credit goes to consumer durables purchases, which rose at a strong 1.1 percent clip. Zero-interest auto financing in the fourth quarter of 2001—made possible by a highly expansionary monetary policy—was behind much of this strength, but consumer durables purchases were above year-earlier levels even in the third quarter of 2001, before auto-purchase incen-

Table 3

### How Does the Current Slowdown Measure Up?

*Comparing contributions to GDP growth in the current and past six cyclical growth slowdowns (percent per year)*

	Consumption				Investment				Government	Net exports
	GDP	Total	Durables	Nondurables and services	Total	Nonresidential fixed	Residential	Inventory		
<b>1959:1–2001:4</b>	3.4	2.3	.5	1.9	.7	.6	.1	0	.5	–.1
<b>Mean of past six slowdowns</b>	–1.3	.1	–.6	.7	–2.3	–.4	–1.0	–.9	.4	.6
<b>(range)</b>	(.2, –2.9)	(1.4, –1.0)	(–.1, –1.0)	(1.6, 0)	(–.9, –3.3)	(.1, –.9)	(–.6, –1.6)	(–.2, –2.4)	(1.0, –.7)	(2.1, –.9)
<b>2001 growth slowdown</b>	.4 H	2.1 H	1.1 H	1.1	–2.6	–1.2 L	.1 H	–1.5	.9	0

NOTES: An "H" or "L" after an entry indicates that it is unusually high or low relative to past slowdowns. For a quarter to qualify as the start of a cyclical growth slowdown, the average unemployment rate in that quarter must be within 0.1 percentage points of the cyclical low rate. Among the quarters satisfying this criterion, the one showing the slowest subsequent four-quarter GDP growth was selected. By these criteria, cyclical slowdowns began in 1960:1, 1969:2, 1973:4, 1979:2, 1981:3, 1990:1 and 2000:4. These calculations are based on GDP data revised on Feb. 28, 2002. The GDP data will be revised again on March 28, 2002, and in subsequent annual and benchmark revisions.

tives kicked in to provide an end-of-year boost. Recall that the greater stability of household spending growth, particularly spending on durable goods, was also an important result from Table 2.

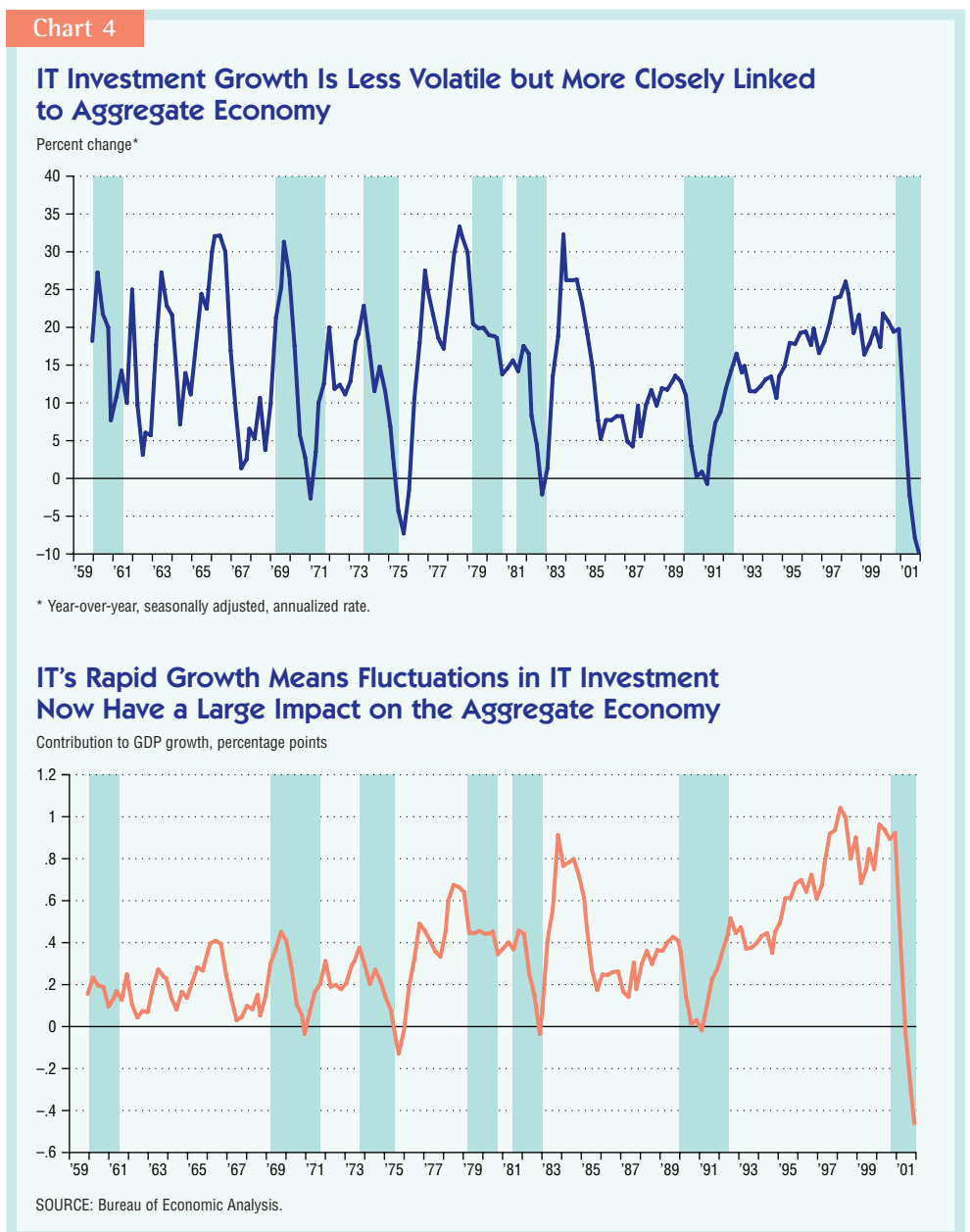
The growth contribution of government expenditures was somewhat above average during the recent slowdown, and that of net exports somewhat below average. Both of these series, however, were within the range of past experience.<sup>5</sup>

The behavior of gross private domestic investment during the recent slowdown was also not unusual, but a closer look reveals important variations across subsectors. Much like consumer durables purchases, residential investment made a positive contribution to GDP growth during the current slowdown, instead of its usual negative contribution. On the other hand, nonresidential fixed investment behaved much worse than might have been expected. The sector's growth contribution dropped off precipitously as the slowdown took hold, subtracting 1.2 percentage points from GDP growth during 2001. The behavior of inventory investment—although within the range of past experience—was disappointing given the trend toward tighter inventory controls.

In summary, the shortfall in GDP growth during 2001 was smaller than average, thanks partly to unusual strength in consumer durables expenditures and residential investment. Inventory investment, government expenditures and net exports behaved about as they have during past slowdowns. The biggest single contributor to the recent slowdown was an unusual collapse in nonresidential fixed investment spending. The following section focuses on the role information technology played in this collapse.

## Impact of IT Investment

Investment in information technology (IT, which includes information-processing equipment and software) has grown relative to the rest of the economy, rising from 0.8 percent of GDP in 1959 to just under 3 percent in 1983 and to nearly 5 percent in 2000. This growth means that a swing in IT investment will have a six-times-larger impact on GDP growth today than in 1959, all else constant. But not all else is constant. As IT devices have become more fully integrated into



a wider cross section of industries, fluctuations in IT investment have become more highly correlated with fluctuations in the overall economy. Declines in IT investment not only carry more weight than before, but also are more likely to come at inopportune times.

Chart 4 illustrates these points and also sheds light on the role IT investment played during the most recent slowdown. The top panel shows IT investment's unadjusted growth rate from 1960 through 2001, with shaded regions denoting the slowdowns. Note how volatile IT investment growth is. The good news is that there appears to be some reduction in volatility since 1984. The bad news is that

periods of sluggish IT investment growth now coincide more closely with periods of sluggish GDP growth. Statistical analysis confirms these impressions.<sup>6</sup>

Prior to the most recent slowdown, IT investment growth was higher than average but well within the historical range. However, the falloff in growth during 2001 was exceptionally sharp.

The bottom panel of Chart 4 clarifies IT investment's impact on economic stability and the most recent slowdown by looking at the growth rate of IT investment weighted by the size of IT investment in GDP. This size-weighted growth rate shows the same increase in correlation with the aggregate economy

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as the unadjusted growth rate but doesn't display any reduction in volatility. Consequently, there is no ambiguity: Far from contributing to the increased stability of GDP growth since 1984, IT investment has tended to make GDP growth *less* stable.<sup>7</sup>

In the most recent slowdown, the plot shows that IT investment added an exceptionally large 0.9 percentage points to GDP growth during 2000 only to subtract 0.5 percentage points from GDP growth during 2001. This 1.4-percentage-point swing in IT's growth contribution from one year to the next accounts for over half of the concomitant slowdown in GDP growth.

That the IT sector was unusually hard hit during the recent economic slowdown does not necessarily mean that the IT collapse *caused* the slowdown or that the slowdown would be less severe if firms still used 1970s-vintage technology. If anything, the manner in which the slowdown spread across the economy casts doubt on a causal role. In particular, the IT collapse was preceded by declines in manufacturing output, which were, in turn, preceded by a sharp slowing of growth in retail sales and a buildup of inventories.<sup>8</sup> The severe IT downturn indicates that IT's stabilizing influence has been indirect, through applications that have increased the resilience of non-IT-producing sectors of the economy.

### Concluding Remarks

The evidence demonstrates that the U.S. economy has become more stable. The relative mildness of the most recent recession illustrates this broader trend. The IT sector has not been an important direct contributor to the economy's improved cyclical performance. However, the fact that much of the economy's increased stability has originated in the inventory investment and consumer durables sectors suggests that the widespread application of new information technologies to inventory control and consumer lending has played a role in reducing the economy's fluctuations. Financial deregulation's contribution has also been important—especially in reducing fluctuations in the residential construction and consumer durables sectors.

A continuation of the strong trend productivity growth of the late 1990s will

help protect the economy from outright declines in output—and, so, from NBER-defined recessions—but not from periods of rising unemployment associated with slowdowns. In this sense, the cyclical implications of one key element of the New Economy—faster productivity growth—are limited. Fortunately, as we have seen, there is more to the New Economy than faster productivity growth.

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### Notes

<sup>1</sup> The reduction in volatility is statistically significant, and its timing can be determined quite precisely. Margaret M. McConnell and Gabriel Perez-Quiros document the 1984:1 break date and examine the variance of different GDP components in "Output Fluctuations in the United States: What Has Changed Since the Early 1980s?" *American Economic Review* 90 (December), 2000, pp. 1464–76.

<sup>2</sup> Let  $\Delta Y$  denote annualized growth in real GDP and  $\Delta X_i$  denote the contribution to GDP growth made by sector  $i$  (so that  $\Delta Y = \sum_i \Delta X_i$ ). In the text, this contribution is called the size-weighted growth rate. Then  $\sigma_Y = \sum_i \rho_i \sigma_i$ , where  $\sigma_Y$  denotes the standard deviation of  $\Delta Y$ ,  $\rho_i$  denotes the correlation between  $\Delta Y$  and  $\Delta X_i$ , and  $\sigma_i$  denotes the standard deviation of  $\Delta X_i$ . Under the Commerce Department's chain-weight methodology,  $\Delta X_i = v_i \Delta Y_i$  where  $v_i$  is the share of sector  $i$  in nominal GDP and  $\Delta Y_i$  is the real growth rate in sector  $i$ . The first and second columns of Table 2 report  $\rho_i \sigma_i$  for each of two time periods.

<sup>3</sup> The variability of the relative price of food and energy has declined by about 20 percent since 1983. The case for monetary policy's stabilizing role is less straightforward (see McConnell and Perez-Quiros 2000, pp. 1474–75).

<sup>4</sup> Most recently, the unemployment rate troughed at 4.0 percent in 2000:4 and was 5.6 percent in 2001:4. However, the unemployment rate had already risen to 4.8 percent in 2001:3, prior to the September 11 terrorist attacks. Increases of that magnitude have always been associated with NBER recessions.

<sup>5</sup> Net exports have been a drag on U.S. GDP growth during the downturn because our trading partners' economies are weak. Industrial production during this recession declined an average 3.8 percent in the G7 nations outside the United States, compared with an average increase of 1.5 percent in the previous nine U.S. recessions.

<sup>6</sup> The standard deviation of quarterly IT investment growth fell from 15.8 percentage points to 10.9 percentage points, while its correlation with GDP growth rose from 0.10 to 0.28.

<sup>7</sup> The standard deviation of size-adjusted IT investment growth rose from 0.28 percentage points to 0.42 percentage points, while its correlation with GDP growth rose from 0.10 to 0.31. So, its contribution to GDP growth volatility rose from 0.03 percentage points to 0.13 percentage points. See Note 2.

<sup>8</sup> Of course, temporal and causal orderings need not coincide. Moreover, it may well be that a reassessment of risks and growth prospects in the IT sector played an important role in spreading weakness that originated elsewhere in the economy.