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Is there still an investment overhang, and if so, should we worry about it?

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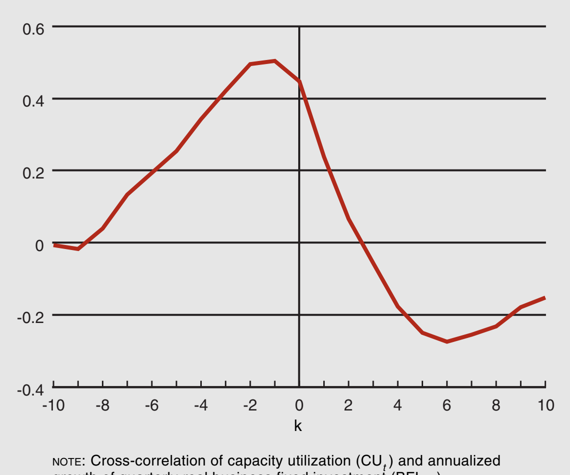
Does an overhang in capital equipment still exist? If so, will investment spending continue to decline? This article finds that an overhang may still exist for some subsectors of investment, such as telecommunications equipment. This will lead to below-trend growth in the near future. However, the authors forecast a capital underhang by the end of 2002, which implies strong investment growth by 2003.

A defining feature of the most recent economic slowdown has been the rapid decline of business fixed investment spending. It wasn't that long ago that this sector was growing at 12.2% (2000:Q2), but growth had slowed dramatically by the end of 2000, leading to a year of negative growth in 2001. While investment spending is traditionally very sensitive to cyclical downturns, there were two notable features of the recent decline in investment spending. First, it declined very rapidly. Second, it led the overall economic slowdown. This has generally been attributed to the buildup of excess capital stock during the heyday of the Internet bubble.

1. Cross-correlation of BFI with CU



NOTE: Cross-correlation of capacity utilization (CU_t) and annualized growth of quarterly real business fixed investment (BFI_{t+k}).
SOURCE: Authors' calculations based on data from Bureau of Economic Analysis and Board of Governors of the Federal Reserve System.

This *Chicago Fed Letter* addresses two questions. First, does an overhang in capital equipment still exist? Second, if there still is an overhang, will investment spending continue to decline in the near future? We measure overhang using four different approaches, described below. All four of these approaches lead us to the same conclusion. Overhang may still exist for some subsectors of investment, such as telecommunications equipment. This will lead to below-trend growth in the near future. However, it does not signal further declines in investment spending. Instead, it signals an investment path that is consistent with our current investment forecast of 4.7% growth in 2002.

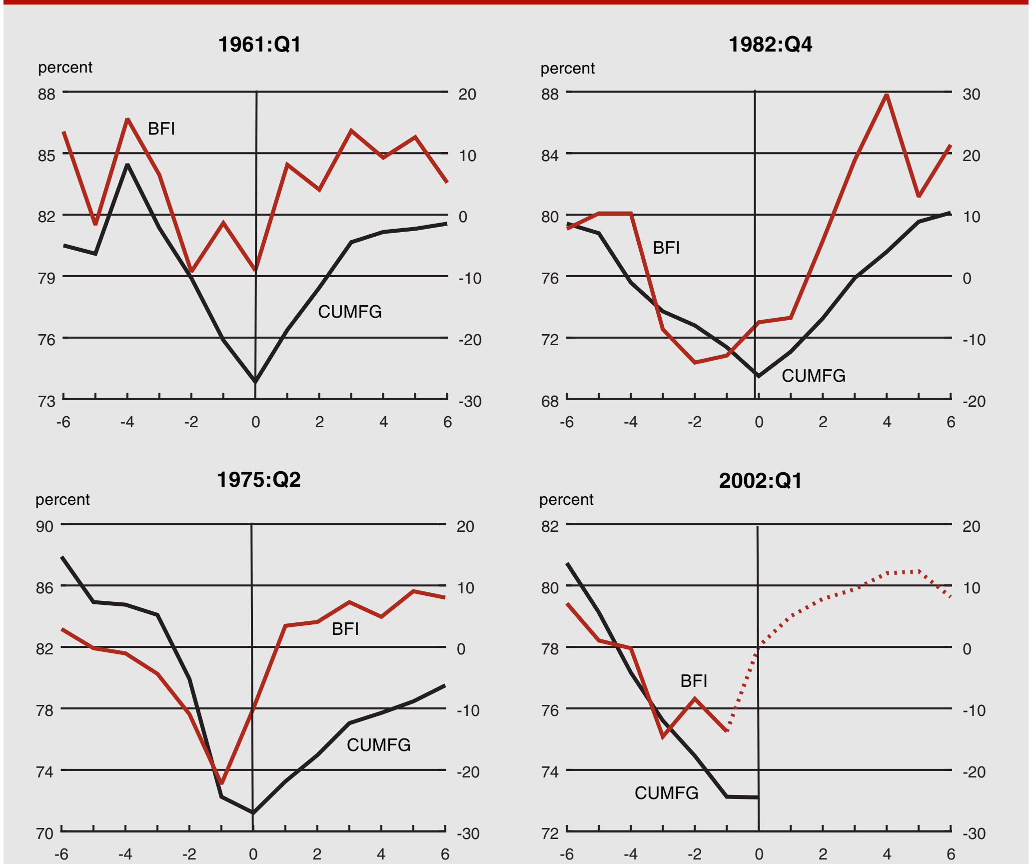
Approach 1: Capacity utilization

One measure of overhang is capacity utilization. Manufacturing capacity utilization bottomed in December 2001 at 72.9% and was still only 73.2% in February, well below its average of 81.5% over the last 40 years. Over that entire period, capacity utilization was lower than today only in 1975 and 1982. By this measure, there definitely is an overhang.

This raises the question of whether capacity utilization will inhibit growth in the near future. Figures 1 and 2 provide evidence on the relationship between capacity utilization in the present and investment growth in the near future.

Figure 1 shows the cross-correlation of capacity utilization with business fixed investment growth. It shows that capacity utilization is positively correlated with lagged business fixed investment growth. In other words, falling investment is correlated with low capacity utilization

2. Episodes with CU manufacturing below 75% since 1960



NOTES: Dashed line indicates forecast. CUMFG is on the left scale; BFI is on the right.
SOURCES: Bureau of Economic Analysis and Board of Governors of the Federal Reserve System.

a few quarters out. This is not surprising, given that a drop-off in demand for investment goods will likely cause both investment good production and capacity utilization to decline.

The relevant question, however, is whether low capacity utilization today predicts low investment growth in the future. Figure 1 shows that there is a positive correlation between capacity utilization today and investment growth over the next two quarters. This indicates that today's low capacity utilization signals that investment growth will be below trend for the next two quarters. However, capacity utilization is *negatively* correlated with investment growth three or more quarters in the future. This indicates that today's low capacity utilization signals that investment growth will be above trend by the end of the year.

Figure 2 shows capacity utilization and investment growth during episodes when capacity utilization fell below 75%. The vertical line running through the 0 denotes the quarter in which capacity utilization reached its trough. The horizontal line running through 0 denotes zero investment growth (investment changes above the zero line denote growth). Note that, of the 1961, 1975, and 1982 episodes, only in 1982 was investment growth negative one quarter after the trough of capacity utilization. Therefore, figure 2 also suggests that today's low capacity utilization indicates only slightly below-trend growth in the future.

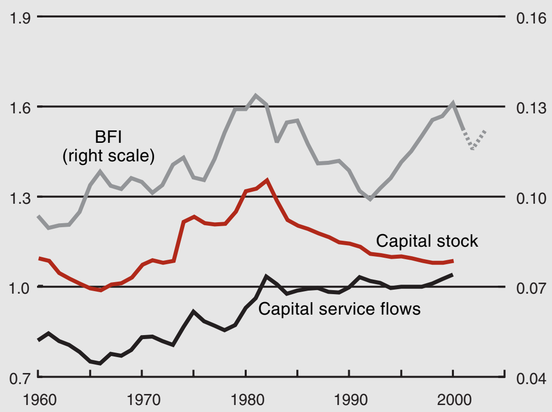
One caveat to this upbeat analysis is that in previous downturns, capacity utilization bounced back reasonably quickly, along with demand for new manufactured goods. Many observers argue that because sales of durable goods were high last year, the quantity of durable goods sold will increase slowly this year. This may inhibit the rebound in capacity utilization and, thus, the demand for new investment goods. Note, however, that in 1975 capacity utilization bounced back slowly yet investment bounced back quickly. Overall, we believe that our investment forecast for sluggish but positive growth over the next two quarters is consistent with the historical relationship between capacity utilization and investment growth.

Approach 2: Investment decisions of firms

Another way of thinking about investment overhang is to consider recent changes in investment growth. Consider the following explanation for the drop in investment spending last year. For some reason, such as the decline in equity prices over the past two years, firms decided that their current capital stock was too high, creating an investment overhang. Therefore, firms began cutting investment spending in order to bring their capital stock down to the newly desired level.

Overhang can persist for some time if it is costly to cut investment spending instantaneously. While it may be relatively cheap to cancel projects that have not yet begun, it is costly to cancel projects that are half-completed, such as the building of a new factory. As a result, investment spending can decline for an extended period. Investment will continue to decline until firms have reached their new desired level of capital stock. However, once firms reach this point, investment should no longer decline. In other words, the path for investment growth will look like a U with a single trough so long as there are no further shocks to the desired capital stock. We would *not* expect investment to decline rapidly, hold steady, and then decline rapidly again, which would make the investment growth path look like a W.

3. Ratios of stocks and flows to GDP



NOTES: Dashed line indicates forecast. For capital service flows, 1996 = 1.
SOURCE: Authors' calculations based on data from Bureau of Economic Analysis.

The data presented in figure 2 are consistent with this story. Note that the investment paths tend to have a single trough. This is not exactly true in 1960–61, where investment had troughs in both 1960:Q3 and 1961:Q1. However, in both the 1974–75 and 1982 recessions, investment spending had a single trough.

Given that investment spending will likely be below trend in 2002:Q1, there still may be some overhang. Nevertheless, the slower rate of decline in investment spending likely signals that the remaining overhang is small. After all, if businesses still have a large overhang, why have they stopped cutting investment spending?

Approach 3: Actual capital stock versus that predicted by a model

Our final two approaches involve comparing the true capital stock with the capital stock predicted by a model. If the current capital stock is above the level predicted by a model, then there is evidence of overhang. Our third approach uses the prediction of most models of investment that the ratio of the nominal capital stock to nominal GDP is stable. These models are guided by the empirical fact that the nominal capital to GDP ratio has been stable for decades, as has the share of GDP that capital receives (about one-third). The reasoning is as follows. When the capital to GDP ratio is relatively high, there is a relatively high level of capital per worker. This makes the return on capital low, causing investment to fall. Figure 3 presents this ratio. As is clear from the figure, the nominal capital to output ratio did not increase during the 1990s. This figure suggests there is no overhang.

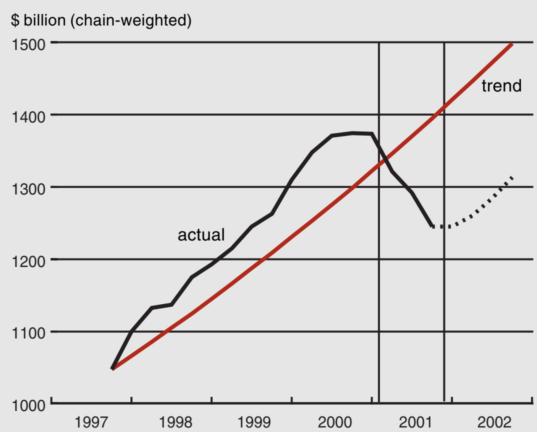
Although the capital to GDP ratio did not rise rapidly during the 1990s, the investment to GDP ratio did rise rapidly, as shown in figure 3. One reason that the high investment to GDP ratio did not lead to a high capital to GDP ratio is that much of the 1990s growth in investment was in computers, and computers depreciate rapidly. One thousand dollars of capital invested in computers produces a greater annual service flow than $1,000 invested in structures. If the annual service flow from computers were not greater than the service flow from structures, nobody would ever invest in computers. Firms must recoup their computer investment over only a few years, whereas firms must recoup their structures investment over a much longer period.

Given that a high level of capital services can be obtained with a small capital stock of computers, it might be reasonable to think that in the long run the capital to GDP ratio will fall, while the capital services flow to GDP ratio will be stable. Service flow of capital is defined such that the present value of service flow from a unit of capital is equal to its purchase price. A $1,000 computer that fully depreciates in one year gives an annual service flow of $1,000. A $1,000 machine that fully depreciates after ten years has an annual service flow of approximately $140. Figure 3 shows that the capital service flow to GDP ratio, normalized to 1 in 1996, increased slightly in the late 1990s. However, this run-up was much smaller than the run-up of the capital services to GDP ratio during the late 1970s. Thus, the capital service flow to GDP ratio does not give any evidence of a large capital overhang.

Approach 4: Recent versus historical investment growth

An alternative approach is to directly predict growth in investment. Investment growth between 1997 and 2000 was well above its historical trend. Assuming no overhang in 1997 (i.e., both capital

4. BFI capital overhang



NOTE: Dashed line indicates forecast.
SOURCE: Authors' calculations based on data from Bureau of Economic Analysis.

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stock and investment were at their trend levels), the 1997–2000 surge in investment pushed investment levels above trend. Figure 4 shows the trend and actual levels of investment, 1997 to present. By this measure, the level of investment was 8% above trend at the start of 2001, and the total overhang was about $284 billion.[1] By 2001:Q4, investment rates were 12% below trend, and the remaining overhang was $139 billion.[2] Given arguably reasonable forecasts of investment,[3] investment spending will fall even further below predicted values this year, causing a capital underhang by the end of 2002. This indicates strong investment growth by 2003.

Conclusion

In summary, the four approaches we presented above point to the possibility of some investment overhang remaining today. However, all four approaches to investigating overhang suggest that the remaining overhang is relatively small and should not significantly inhibit growth in investment spending later in the year.

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[1] This is a much larger estimate of investment overhang than presented in the *Wall Street Journal* article, "High-tech 'overhang': Economic hangover," on April 30, 2001. Our estimate for information processing alone is $196 billion, versus the $100 billion cited in that article. Therefore, vis-à-vis many estimates, we are overestimating overhang. We assume that trend growth rates for information processing equipment, non-information processing equipment, and structures spending were equal to their average growth rates between 1960 and 1997. We also assume annual depreciation rates of 22% for information processing equipment, 12% for non-information processing equipment, and 3% for structures.

[2] When broken down by sector, there is an overhang of $96 billion in information processing equipment and $77 billion in non-information processing equipment. However, there is an underhang of $34 billion in structures at the end of 2001.

[3] This model splits business fixed investment into information processing equipment, non-information processing equipment, and structures. Current growth in each of these sectors depends on lagged growth rates of investment, profits, the Institute for Supply Management's Purchasing Managers Index, and current and lagged interest rates. This forecast shows investment spending 4.7% higher in the fourth quarter of 2002 than in the fourth quarter of 2001.