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Information Technology and Growth in the Twelfth District

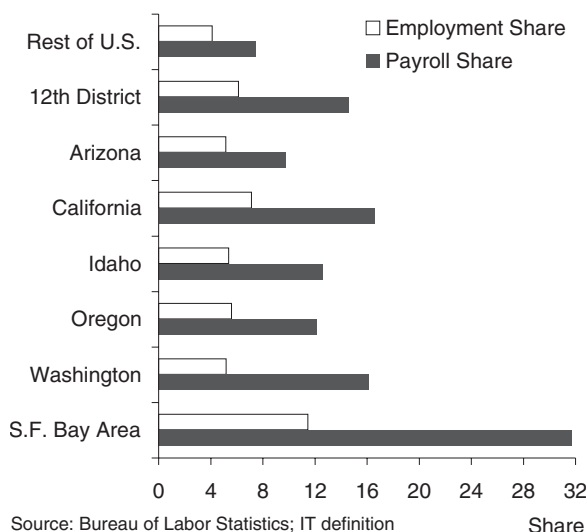
The Twelfth District includes the nine westernmost states and has some of the nation's leading technology centers. Over the past several years, robust growth among information technology (IT) firms has fueled gains in output, employment, and earnings and helped the District economy expand more rapidly than the rest of the nation. Recently, however, economic conditions among technology firms in the U.S. have weakened considerably, with many announcing earnings shortfalls and employment reductions. As a result, employment growth in the Twelfth District has slowed substantially, converging with that of the rest of the U.S. This *Economic Letter* reviews some of the recent trends in the IT sector and examines their effects on District employment growth. As the *Letter* shows, a key dimension of the current IT slump is the simultaneous decline of both the manufacturing and services sides of the sector.

IT in the Twelfth District

Whether measured by the amount of venture capital invested, number of patents issued, dollar value of exports, or employment and payroll, the Twelfth District has many of the nation's top technology centers. Not surprisingly, then, developments in IT are of central importance to the District economy. Figure 1 displays employment and annual payroll in IT manufacturing and services as a share of total nonagricultural employment and payroll in 2000. The IT sector includes manufacturing and services firms producing computers and office equipment, consumer electronics, communications equipment, electronics components and accessories, semiconductors, industrial electronics, photonics, defense electronics, electro-medical equipment, communications services, and software and related components.

The figure shows that the share of employment associated with the IT sector is larger in the Twelfth District than in the rest of the U.S. IT accounts for about 6% of total nonagricultural employment in the District, compared to about 4% in the rest of the U.S. Measured by employment, the District is

Figure 1
Importance of IT sector



Source: Bureau of Labor Statistics; IT definition from the American Electronics Association.

about 1.5 times as dependent on IT as the rest of the U.S.

The importance of technology to the District is even more apparent in the payroll shares (wages, salaries, and benefits), where relatively high salaries paid to IT workers boost its value to the economy. Nearly 15% of District nonagricultural payroll comes from the IT sector, compared to less than 8% in the rest of the U.S. Thus, measured by payroll, the IT sector is about twice as important in the Twelfth District as in the rest of the U.S.

Within the District, California, especially the San Francisco Bay Area, and Washington stand out as areas with very strong IT presences. About 7% of employment and 17% of nonagricultural payroll in California come from tech sectors; in the Bay Area, the shares are 11% and 32%, respectively. IT also is important in Washington, particularly as a contributor to payroll; Washington's tech sector

accounts for about 5% of total private sector employment, but about 16% of nonagricultural payroll. Among all Twelfth District states, only Alaska, Hawaii, and Nevada have relatively less IT employment and payroll than the rest of the U.S.

IT contributions to growth in the 1990s

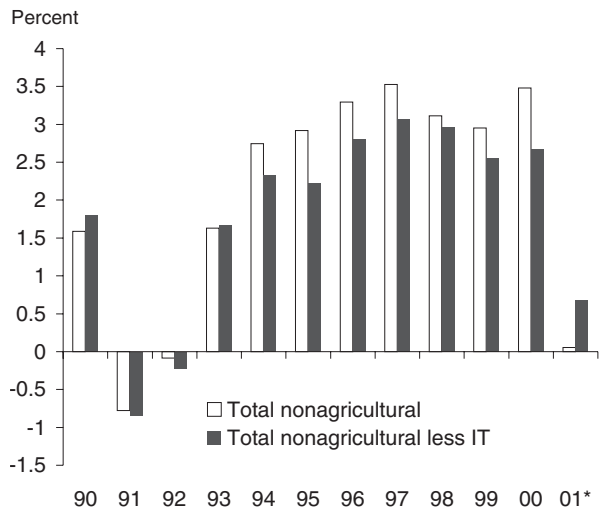
Between 1995 and 1999, business investment in IT goods increased at an average of 20% per year, fueling rapid growth in output, employment, and earnings among technology companies. Because of the high concentration of IT activity in the West, the Twelfth District economy benefited directly from this surge in IT investment. To quantify the direct impact of the IT sector on employment growth, Figure 2 shows nonagricultural employment growth in the Twelfth District, both with (white bars) and without (black bars) the SIC industry groupings containing the vast majority of the District's technology firms (i.e., SIC 35, 36, 38, 73, and 87). As the figure indicates, between 1990 and 1993, the technology sector contributed modestly to the pace of employment growth in the District. In 1994, however, growth in IT-related sectors began to make significant contributions to the District's pace of expansion. Although the amount of the contribution varies from year to year, between 1994 and 2000 technology-related sectors boosted total nonagricultural employment growth in the District an average of 0.5 percentage point. The direct and indirect boost given to the District by IT-intensive industries helped the District economy expand more rapidly than the rest of the U.S. over the period (not shown).

Slowing in the IT sector

Following more than five years of double-digit growth, business investment in IT products and software has slowed substantially this year, damped by uncertainty in the national economy, the dot-com and telecommunications crash, and overinvestment by businesses in IT goods. The abrupt slowdown in business investment in IT has had a noticeable impact on orders, shipments, and production among technology firms. So far this year, new orders of IT manufactured goods including semiconductors, computers, and communications gear have declined by nearly 15%; shipments of these goods also have fallen, dropping by about 5% compared to the same period last year. By comparison, growth in both orders and shipments of IT manufactured goods averaged 15% in 2000. As a result, many firms have found themselves with excess inventories and unutilized production capacity, resulting in declines in output and employment in these sectors.

Although production-related adjustments in the IT sector occur periodically, the depth and breadth of the current downturn have proven to be larger than expected and greater than in past cycles. One indication of the magnitude of the downturn is the

Figure 2
Impact of IT on District employment growth



* Annualized growth January to September

Source: Bureau of Labor Statistics

decline in District employment in IT-related industries. Figure 3 shows employment growth in these sectors over the past decade. As the figure indicates, during the 1990s fluctuations in IT-related manufacturing employment growth were common. In the current slowdown in IT manufacturing, however, the adjustments are more abrupt and deeper than usual. Moreover, during the 1990s, downturns in IT manufacturing were partially offset by rapid growth in non-manufacturing technology firms, which has not occurred this time. The dot-com contraction and a falloff in business investment in software have resulted in net job losses in the District's business services sector so far this year.

Impact on District growth

The prominence of the IT sector combined with the deep and broad downturn it has experienced have significantly damped District employment growth, turning the climate from good to bad in just a few months. For example, in 2000, employment in the District increased by 3.5%, with job gains continuing through the end of the year. Growth slowed significantly in the early months of 2001, but remained positive; employment increased by 0.8% during the four months ending in April. Conditions then deteriorated substantially, with District employment falling by 0.5% at an annual rate during May through September. Overall, the pace of employment growth in the District has swung 3.4 percentage points so far this year, putting employment growth in the West in line with the rest of the U.S. for the first time since the last recession.

Although the District economy likely would have slowed along with the national economy, the slump in the IT sector has intensified the downturn. Using the comparisons of employment growth with and

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