

Economic Review and Outlook

The Slowdown in Growth

The U.S. economy began to slow late in 2000 and the slowdown is continuing into the spring of 2001. The slowdown, which was precipitated by an extended period of monetary restraint by the Federal Reserve, has been marked by deteriorating corporate profits and a steep decline in equity prices, particularly in the high-tech area. While the stock market decline certainly affects other economic variables, such as business and consumer spending, the condition of the economy in general should not be viewed as synonymous with the condition of this market. On the bright side, inflation and unemployment are near historically low levels, the Federal budget is balanced, and productivity gains remain robust. The current consensus forecast of private sector economists foresees a 2.0-2.5 percent rate of real GDP growth through fiscal year 2001, with an acceleration to 3.5 percent in fiscal year 2002, roughly the same as experienced in 2000. The unemployment rate should remain near the current 4.2 percent through fiscal year 2001, while inflation is expected to continue at a low and stable rate in the 2.3-2.6 percent range. Productivity seems capable of sustainment through expenditures on research and development and past business investment. With growth in the United States and abroad recovering through fiscal year 2002, the demand for USPTO products and services is expected to continue to expand as well. The following sections attempt to place the current situation in perspective.

Business Investment and Research & Development

During the past ten years, the focus of U.S. economic growth shifted from personal consumption to business investment. From 1991 until last year, the real growth rate of fixed business investment had been trending upward, exceeding nine percent in 2000, more than twice the rate of overall GDP growth. This year the rate of business investment is expected to drop below three percent, which is about a third of the 2000 rate.

To help understand this behavior, it is important to consider that today's business investment differs qualitatively from that of the recent past. Traditionally, fixed investment has been aimed primarily at increasing production of existing products -- new steel mills, new petroleum refineries, etc. Current business investment, however, targets production of new services and products and, especially, productivity increases of all kinds. Fixed investment now tends toward servers and networks rather than bricks and mortar, and these are exactly the types of products hit the hardest by the recent economic slowdown in high-technology industries.

On a more positive note, signs of business dynamism continue as industries are willing to fund ever-higher levels of research and development. Industry R&D expenditures ratcheted upward in 1996 to historically high levels, and the expectation is that this annual growth of about eight percent will continue through 2000.

Innovation, Productivity, and Economic Growth

Business investment and R&D trends in the recent past have strongly underwritten continuing innovation in technology and marketing. Such a pattern was fully consistent with the theory of economic growth frequently articulated by Federal Reserve Chairman Alan Greenspan. However, with the current economic slowdown, this theory is about to be tested.

Mr. Greenspan has noted compelling evidence that technological innovation is a key driving force behind the upsurge in U.S. productivity and the resulting real growth of the economy. In addition, there has been a perceptible quickening in the pace at which technological innovations were being applied, indicating that growth in productivity was not just a cyclical phenomenon or a statistical aberration, but a more deep-seated and still developing shift in the economic landscape.

The view has been supported by available data. An unusual feature of the economic expansion is that productivity growth accelerated as the expansion continued. During the 1997-99 period, output per hour grew 2.8 percent in private business or about 1 percentage point faster than during the 1990-96 period. Information processing equipment accounted for about a third of the growth in output per hour, while the Bureau of Labor Statistics (BLS) estimates that R&D spending contributed about another 10 percent. In 1999-2000, output per hour is expected to rise even faster, almost above 3 percent and the contribution of technology is likely to be greater than calculated for previous periods. However, contrary to what current R&D expenditures levels are suggesting for future levels of productivity, there are new forecasts for 2001 indicating the possibility that productivity levels may not be sustained. If this does materialize, it would be a sign that we are not experiencing the structural change noted by Chairman Greenspan.

When considering this view, it is also instructive to consider previous technological "revolutions." Most historians would single out four periods of technological advance in the United States: (1) the steam power age, with the greatest growth from the 1780s to the 1840s; (2) the railway age, with greatest growth from 1840s to 1890s; (3) the electricity age, with greatest growth from 1890s to 1920s; and (4) the information age, from the 1960s to the present. It is possible to compare these technological changes by rate of decline in the cost of the new technology and in its subsequent rate of adoption. The rate of price decline in each period is shown below, and with regard to adoption rate, steam power took 90 years to reach a 50 percent market penetration, electricity took 40 years, and computers just recently reached 50 percent after 30 years. However, the Internet has reached the 50 percent level in the United States after only seven years of commercial existence.

Productivity growth resulting from the introduction of electricity didn't begin until 1920, when it powered half of American industrial machinery. Some speculate that the productivity surge beginning in the mid-1990s was a result of computerization reaching a similar stage. If this rate of productivity growth were to be sustained for the next decade as IT and the internet transform business, GDP per capita would grow by around 3 percent per year, much faster than during the first industrial revolution's peak in the mid-19th century, when GDP per capita grew at an average of around 1.5 percent, or during the electrical age, when growth accelerated to just over 2 percent in the 1920s. While current forecasts do not support this scenario, it is too early to know the final outcome. The current information age technology revolution is clearly progressing more rapidly than similar periods of significant change in the past and has the potential to have greater economic impact.

Principal Technology	Time Period	Annual Price Change
Steam Power	1790-1850	-1.2 %
Rail Freight	1870-1913	-3 %
Electricity	1890-1920	-6 %
Computer Processing	1970-2000	-35 %

In summary, technological innovation has been the driving force behind the recent unprecedented economic expansion experienced by the United States over the past ten years. Expanding research and development efforts have supplemented the inherent creativity of the American inventor to produce innovation in all areas of life. This innovation drive pushed the economy to record levels of business investment and to gains in productivity. However, the economy has now entered a period of slow growth. We are now at a critical point, where a determination will be made whether or not we are in a "new economy," experiencing the structural change noted by Chairman Greenspan and others

Global Trends

The global economy is also starting to show signs of slowdown. Given the sluggish growth in the bellwether U.S. economy as spending on technology slows, and the disappointing economic news coming out of Australia, Canada and Japan, global economic growth is expected to be slower over the next few quarters. In particular, the outlook for the Japanese economy has turned gloomier. Japan has become more dependent upon exports because of weak domestic consumer demand, but exports have also weakened because of the overall global economic slowdown. However, economies in Europe are expected to stay relatively strong through 2001. The global outlook for 2002 may be more optimistic. Key economies including the United States and Japan are expected to strengthen and stimulate international trade. Consensus forecasts for 2001 and 2002 are presented in the table below.

Country	2001 GDP change	2002 GDP change
United States	+2.2%	+3.4%
Japan	+1.1%	+1.7%
Euro Area	+2.5%	+2.9%
U.K.	+2.5%	+2.8%

Intellectual Property Rights

America's thinkers and creators are at the heart of the technological-based economic growth seen in recent years and their efforts lead directly to the need for intellectual property protection. In considering recent demand for intellectual property protection, it is apparent that innovation is intimately involved on several fronts. On the application input side, economic growth greatly influences the level of demand for patenting services through expanded opportunities for innovation and through the enhanced attractiveness of investment in new commercial ventures. At the same time, the USPTO output plays a prime role in facilitating the technological innovation that causes the economic growth in the first place by solidifying intellectual property rights and by widely disseminating new scientific knowledge, and thus promoting knowledge "spillovers" – the accrual of technological change benefits to economic agents other than those undertaking the underlying research and development. Many economists believe the spillover benefits of innovation are much greater overall than the private benefits generated by the patented product or process itself. Many also believe that global commerce has magnified the spillover effect by expanding the opportunities to apply innovative ideas.

In addition, economists and others believe they have discerned a shift in the basic role of patents – a shift that can also be largely attributed to technological change. Traditionally, the economic value of individual patents has been derived from their ability to protect and shelter investment in new products and processes. Today, some believe that patents are becoming more valuable as components of

corporate portfolios assembled as bargaining tools in negotiations of various sorts with other organizations. For example, as new products and processes become more complex technologically and as innovation accumulates, producers must be able to negotiate economically viable licensing agreements with other patent holders. And as the rate of innovation increases and product cycle times diminish, the ability to negotiate these agreements very rapidly becomes critically important. Such agreements are more viable between and among organizations with patent portfolios similar in scope and value.

Thus, patents have become an increasingly important element of competition and, as a result, companies have apparently stepped up their rate of patenting in order to maintain competitive position. In essence, technological innovation has affected the economic role of patents as competitive assets, as well as their role in the incentivization of investment. This shift in role is evident in world-wide demand for patent protection. Globally, the demand for patent rights rose from 2,306,840 to 5,806,570 from 1994 to 1998, an annual average increase of about 25 percent. The number of first filings in 1997 was 634,230. For these first filings, one year later (1998) 5,141,337 subsequent filings were registered. Thus on average one invention for which a first patent right was sought, leads to 8.1 subsequent filings of an application for patent rights in other areas. Three years ago, the rate was at the level of 3.3. This increase in the proportion of subsequent filings shows the ongoing internationalization of patent rights.

The growth explosion for trademark applications in recent years was also is at least partially attributable to technological innovation. One probable manifestation is the shorter product cycle time attributable to rapid technological innovation, which generates greater numbers of new products per year. New products create the need for new identities, and this leads to new trademark applications. A recent Harvard Business Review article points out that despite conventional wisdom, branding is even more important for high-tech products than it is for traditional consumer goods. Another factor is the emergence of the global economy, spurred by communications technology undreamed of only a few years ago. While opening up new commercial opportunities, the global marketplace has raised the cost of product introduction and advertising and has engendered an urgent requirement to protect this investment (e.g., Internet domain names), both domestically and abroad. These requirements also directly generate additional trademark applications.

Unfortunately, it appears that these same factors might have introduced an unforeseen element of volatility into the demand for trademarks. Just as the growth spurt of fiscal years 1999 and 2000 mirrored the performance of the high-tech portion of the stock market, it now appears that trademark applications might be mirroring the downward slide of that same sector. Analyses have shown that fiscal year 1999 was driven in large part by Internet and computer service organizations and we believe that the same was true for fiscal year 2000 as well. This industry has been particularly hard hit by the current economic slowdown and trademark applications now appear to be falling to pre-1999 levels, although it is still too early in the fiscal year to project the final level with any certainty. Once this shakeout has run its course and the economy returns to moderate growth rates, trademark demand is expected to stabilize near its longer term growth path of between 10 and 15 percent.