



VOL. 2, NO. 5  
MAY 2007

# Economic Letter

*Insights from the*  
FEDERAL RESERVE BANK OF DALLAS

*Women have followed  
the time-honored path  
to economic success:  
Get an education.  
Seek better jobs.  
Become entrepreneurs  
or managers.*

## Women at Work: A Progress Report

by *W. Michael Cox and Richard Alm*

Throughout history, much of women's work has taken place in the home rather than in the marketplace. Recent generations of women, however, have been more likely to work in the formal economy, particularly in the United States and other developed countries.

American women's labor force participation has risen from 32 percent in 1948 to nearly 60 percent today (*Chart 1*).<sup>1</sup> The movement of women into the workplace has slowed and perhaps even ebbed in recent years, but the wavering appears concentrated among younger women, many of whom are probably in school preparing for better-paying jobs. More than three-quarters of women ages 25 to 54—the prime working years—are in the labor force, holding a job or looking for one.

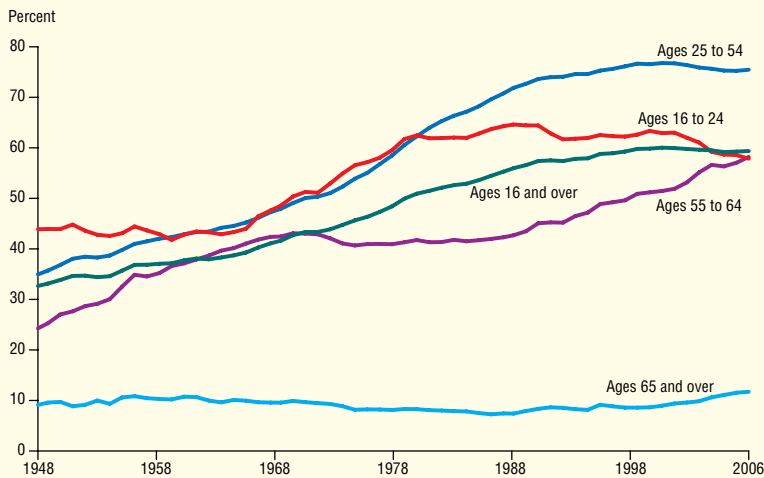
Much of the discussion of women in the workplace fixates on pay ratios between men and women. The wage gap has been a rallying cry since the



Chart 1

## Women's Work Moves to Market

(Labor force participation rate)



SOURCE: Bureau of Labor Statistics, Current Population Survey, Labor Force Statistics.

1960s, when women on average earned less than 60 cents for every \$1 men did. Over the next 40 years, that 60 cents rose to 81 cents.<sup>2</sup> But more sophisticated analyses—which account for such variables as education, work experience, occupation and family factors—show even greater progress in reducing the wage gap. Economist June O’Neill’s most comprehensive model, for example, concludes that women ages 35 to 43 earn 97.5 percent of what men do.<sup>3</sup>

Changes in law, social mores and business practices no doubt played important roles in improving the lot of women in the workplace. Just as important, the U.S. economy has grown fivefold since 1960, providing women with incentives and opportunities to work and accommodating the resulting labor-supply bulge. At the same time, employers have put greater value on cognitive and interpersonal job skills, shifting away from the physical tasks that gave men advantages.

Women not only entered the workforce en masse at a fortuitous time, they’ve also followed the time-honored path to economic success:

Get an education. Seek better jobs. Become entrepreneurs or managers. Women still lag men by most measures, but they’ve made sometimes stunning advances over the past two generations in graduating from college, shifting to better-paying occupations, starting businesses and becoming corporate executives. Focusing solely on the wage gap misses these sweeping changes in the patterns of women at work.

### Women’s Education

Education largely determines Americans’ incomes—not just as young adults but throughout their lives. Workers with few years of schooling usually qualify for jobs with low pay, little status and harsh working conditions. Additional education qualifies workers for occupations with higher salaries, greater prestige and better working conditions. Workers who graduate from college and professional schools fill most of the best jobs.

Among women 25 to 34 years old, college graduates earn nearly twice as much as those who didn’t fin-

ish high school. Women with doctoral and professional degrees make more than three times as much as high school dropouts (*Table 1*). The education premium rises as women age because work experience increases the market value of their knowledge.

Women’s lifetime earnings rise from nearly \$1.2 million for high school graduates to more than \$2 million for college graduates. Doctoral and professional degrees push lifetime earnings beyond \$3.3 million.

Gains from education and work experience are higher for men, who typically enter more lucrative fields and have more years in the labor force. Earnings data don’t adjust for these gender-based disparities. The earnings gap is smallest among younger workers with similar educational backgrounds. Previous generations of women started out further behind men and lost ground as they left the labor force temporarily to raise families.

Earnings data make it clear the U.S. economy provides women with strong incentives to get an education. Have they done so?

Overall, the U.S. labor force has become better educated over time. College graduates now make up 30 percent of the U.S. population over age 25—by far the highest in the world.<sup>4</sup> The past two generations of women received more of the diplomas. Their share of bachelor’s degrees rose from 24 percent in 1950 to 57.5 percent in 2004 (*Chart 2*). At the master’s level, women went from 29 percent to 59 percent. The most impressive gains were among Ph.D.’s, where women’s share went from 10 percent to 47.7 percent over 55 years.<sup>5</sup>

By some key measures, women are now more educated than men. Overall, 19.8 percent of working women are college graduates, compared with 18.3 percent for men. More than 31 percent of women have some college, while 26 percent of men do.

Women have not only sought more education, they’ve also shifted their focus to the better-paying

Table 1

## Education, Work Experience Pay Off for Women

	Average annual earnings in 2005				Experience premium 24–34 to 55–64	Estimated lifetime earnings
	Ages: 25–34	35–44	45–54	55–64		
High school dropout	\$21,113	\$20,244	\$22,446	\$20,789	–\$324	\$845,920
High school graduate	25,783	29,301	31,246	31,757	5,974	1,180,870
Some college, no degree	30,924	36,401	38,239	38,262	7,338	1,438,260
Associate's degree	32,498	37,979	40,924	42,812	10,314	1,542,130
Bachelor's degree	42,038	54,323	56,306	49,231	7,193	2,018,980
Master's degree	49,890	62,222	64,386	61,661	11,771	2,381,590
Doctorate	72,909	79,958	89,958	88,470	15,561	3,312,950
Professional degree	78,288	104,396	104,074	107,295	29,007	3,940,530
Education premium (equally weighted average)	\$44,180	\$53,103	\$55,947	\$55,035		

NOTE: Earnings are for year-round, full-time workers.

SOURCE: Census Bureau, Current Population Survey, Annual Social and Economic Supplement.

careers. More than 19 percent of women received bachelor's degrees in business in 2004, up from just 2.9 percent in the early 1970s. By contrast, the share of bachelor's degrees in education fell from 36.1 percent to 10.4 percent, an indication fewer women see their opportunities limited to teaching, with its low pay. Women are also less likely to study English, social sciences and history, all subjects that often lead to teaching careers (*Table 2*).

Women have also made great strides in a handful of disciplines that require additional education and lead to high-paying and prestigious occupations. They earn three-quarters of veterinary medicine degrees and two-thirds of pharmacy degrees. Women make up nearly half the graduates in law and medicine, and they're receiving more than 40 percent of the M.B.A.'s and dentistry degrees (*Chart 3*). In the early 1970s, women accounted for less than 20 percent of the pharmacy graduates and less than 10 percent of the graduates in the other fields.

The march into the professions began shortly after enactment of Title

IX, the 1972 federal legislation that mandated equal access to education. The new laws no doubt opened doors for women, but changes in women's expectations about work provided at least some of the impetus for the new policies and curriculum choices. Once they could anticipate better returns from education, women had more reason to campaign against gender-based barriers and attend college.

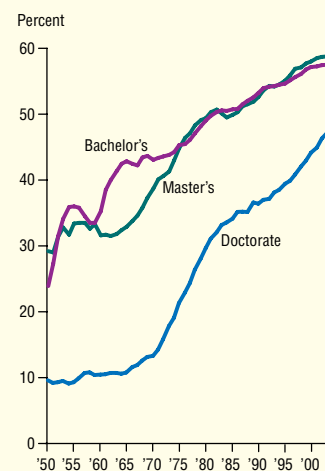
Returns to education depend heavily on expected labor force participation, particularly in such demanding fields as law, pharmacy, medicine and dentistry. Women who plan to leave the workforce to raise children or for other reasons are less likely to target occupations that require long years of schooling. Time and money spent on education offer greater returns for women who intend to work full-time for most of their careers. More-educated women tend to bear children later in life, adding to their years in the labor force and increasing education's financial benefits.<sup>6</sup>

As more women graduated from college, average incomes rose. Surging

Chart 2

## More Women Graduate from College

(Share of new degrees)



SOURCES: National Center for Education Statistics, *Digest of Education Statistics*; Census Bureau, *Statistical Abstract of the United States*.



college enrollments allowed women to earn higher incomes in business, law and other previously male-dominated occupations. From 1979 to 2005, median wages for women with college degrees increased 58 percent. Male college graduates saw their pay rise 24 percent during the same period. In 2004, 33 percent of women earned more than their husbands, up from 24 percent in 1987.

While education has been instrumental in narrowing the wage gap, it also helps explain why women still earn less than men on average. Despite the changes in college majors, women maintain large enrollments in many disciplines compatible with fam-

ily responsibilities—fields where work schedules are more flexible and skills don't depreciate as much during labor force interruptions. Women receive more than 60 percent of the bachelor's degrees in the health professions, social services, education, English and foreign languages—just as they did in the early 1970s.

These fields tend not to pay well. A woman engineering major working full time, for example, earns 27 percent more than a woman education major with a full-time job. The American Association of University Women cites occupational choice as one reason women college graduates don't earn as much as men.<sup>7</sup>

of architects and 4 percent of lawyers. Three decades later, their shares have risen to 22.5 percent of dentists, 24.4 percent of architects and 30 percent of lawyers. Over the same period, women have dramatically increased their employment in a wide range of other professions—from accounting, design and pharmacy to chemistry, photography and real estate (Table 3A).

In a parallel trend, women hold a declining share of the jobs in many occupations traditionally regarded as “women's work.” Today, employees who wait on tables, cook, handle telephone calls and make clothing are less likely to be female (Table 3B).

While two generations of women raised their educational achievements and poured into the labor force, the U.S. economy underwent an epochal transformation. The share of employment in manufacturing and other goods-producing industries began declining in the 1960s. Overall job growth, however, has remained strong, with service industries absorb-

Table 2

### What Women Study

(Percentage point change in share of bachelor's degrees by subject, 1970–71 to 2003–04)

Business	16.4
Other	7.3
Communications and journalism	4.8
Psychology	3.3
Health professions	2.6
Biological and biomedical	1.9
Computer sciences	1.8
Engineering	1.7
Agriculture	1.2
Public administration and social services	1.1
Visual and performing arts	.9
Architecture	.3
Physical sciences	.1
Mathematics and statistics	-1.8
Modern foreign languages	-2.7
Social sciences and history	-6.2
English	-6.9
Education	-25.7

SOURCE: National Center for Education Statistics, *Digest of Education Statistics*.

### Women's Jobs

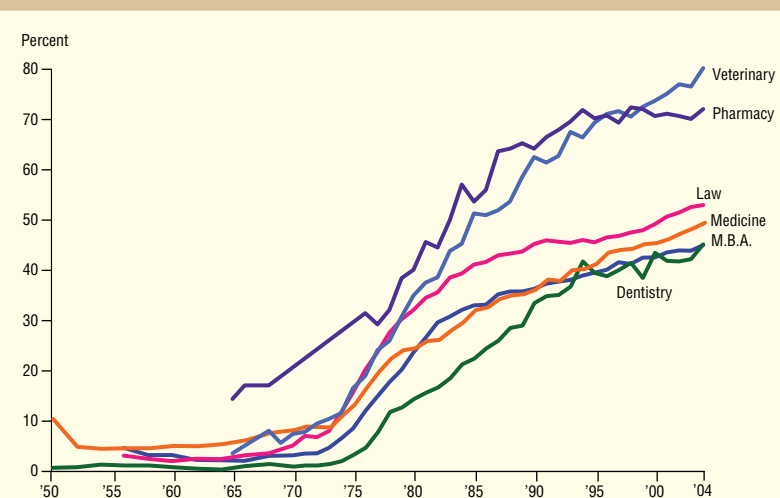
Women go to college with an eye toward improving their chances in the job market—and they've succeeded. Their educational achievements manifest themselves in a marked change in the gender profile of many occupations.

In 1972, women accounted for just 1.9 percent of dentists, 3 percent

Chart 3

### More Women Prepare for Professional Careers

(Share of new degrees)



SOURCES: National Center for Education Statistics, *Digest of Education Statistics*; Census Bureau, *Statistical Abstract of the United States*.



ing most of the new entrants into the labor force.<sup>8</sup>

Broadly speaking, goods-sector work differs from services work. Factory jobs and natural resource extraction tend to rely on physical skills—the stevedore’s muscle power or the machine operator’s manual dexterity. Services work more likely entails the ability to handle mental tasks and relate to others—clerks’ formulaic intelligence, doctors’ analytic reasoning, designers’ imagination and creativity, and psychologists’ empathy.<sup>9</sup>

While they might have an edge over women in some physical skills, men have no advantage in higher-order human talents—analytic reasoning, imagination, creativity, interpersonal skills and emotional intelligence. Women’s move into formerly male-dominated occupations has largely occurred where work isn’t physically demanding. More than 92 percent of the jobs women hold are in services, up from 77 percent in the mid-1960s. Men have migrated to services at about the same pace, but they’re still much more likely than women to work in goods-producing jobs (*Chart 4*).

Women’s commitment to education has prepared them for work in services, where the economy has been creating the most jobs. Today, this sprawling sector pays more than goods-producing industries, on average. Services work also tends to offer better working conditions and lower unemployment rates.

Services’ growing importance to the U.S. economy casts a different light on the oft-lamented reluctance of women to pursue engineering jobs. Only 2.4 percent of U.S. women graduates in 2003 were engineering majors, trailing 27 Organization for Economic Cooperation and Development countries and Israel. To many analysts, the lowly status of engineering among U.S. women suggests a reluctance to use analytical skills. The U.S. ranked only slightly better with women graduating in the physical sciences.

Table 3

## Gender No Longer Occupational Destiny

### A. Women Filling Ranks of Higher-Paying Occupations...

	Women's share of employment		Percentage point gain
	1972	2005	
Accountants	21.7	61.9	40.2
Designers	18.2	55.0	36.8
Pharmacists	12.7	48.3	35.6
Public relations specialists	29.9	61.4	31.5
Psychologists	38.0	67.3	29.3
Advertising agents and sales	22.7	50.2	27.5
Lawyers	4.0	30.2	26.2
Chemists	10.1	35.3	25.2
Biological scientists	25.0	48.7	23.7
Photographers	15.6	39.0	23.4
Postsecondary teachers	22.0	44.4	22.4
Physicians and surgeons	10.1	32.3	22.2
Architects	3.0	24.4	21.4
Dentists	1.9	22.5	20.6
Real estate agents	36.7	57.1	20.4
Clergy	1.6	15.5	13.9
Computer programmers	19.9	28.4	8.5

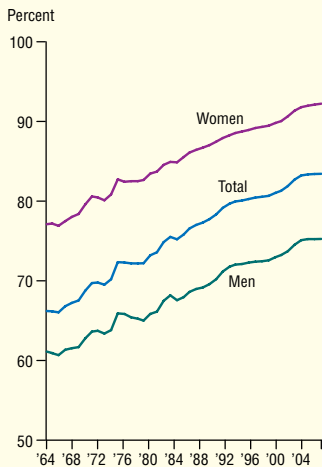
### B. ...and Leaving Those Once Considered 'Women's Work'

	Women's share of employment		Percentage point gain
	1972	2005	
Restaurant servers	91.8	71.8	-20.0
Cooks	62.2	42.3	-19.9
Telephone operators	96.7	78.0	-18.7
Tailors, dressmakers, sewers	92.3	79.3	-13.0
Private household cleaners, servants	97.2	85.9	-11.3
Cashiers	86.6	75.9	-10.7
Models and product promoters	93.8	85.9	-7.9
Laundry and dry-cleaning workers	69.7	62.8	-6.9
Registered nurses	97.6	92.3	-5.3
Receptionists	97.0	92.4	-4.6
Elementary school teachers	85.1	82.2	-2.9
Secretaries	99.1	97.3	-1.8
Typists and word processors	96.1	95.0	-1.1

SOURCE: Bureau of Labor Statistics, Current Population Survey, Employment and Earnings.



**Chart 4**  
**More Women Work in Service Sector**



SOURCES: Bureau of Labor Statistics, Current Employment Statistics.

If we expand the roster of analytical subjects to include social sciences, business and law, women's supposed aversion to using analytical skills fades. U.S. women jump to a respectable seventh place among the 28 nations (*Chart 5*).

The key lies in the way educational and occupational choices reflect the country's economic structure—and the opportunities it creates. Engineering is usually a goods-producing occupation, so nations with a higher concentration of industry offer women engineers more opportunities. Each 1 percent increase in a country's share of employment in manufacturing, mining and construction leads to a 0.25 percentage point rise in women obtaining engineering degrees (*Chart 6*). The relationship isn't significant for men. Women are the ones who respond to signals from industry about whether to become engineers.

The U.S. leads other nations in the transition from industry to services, so American women have less incentive to pursue degrees in engineering. They see better opportunities in applying their analytical talents in the social sciences, business and law.

Fields of study may differ from one country to another, but one constant has been the rising share of women getting college educations. Among the 17 OECD countries with sufficient data, the number with more women than men attending college rose from four to 15 between 1985 and 2002. The remaining two, Turkey and Switzerland, saw gains in women's share of college students.

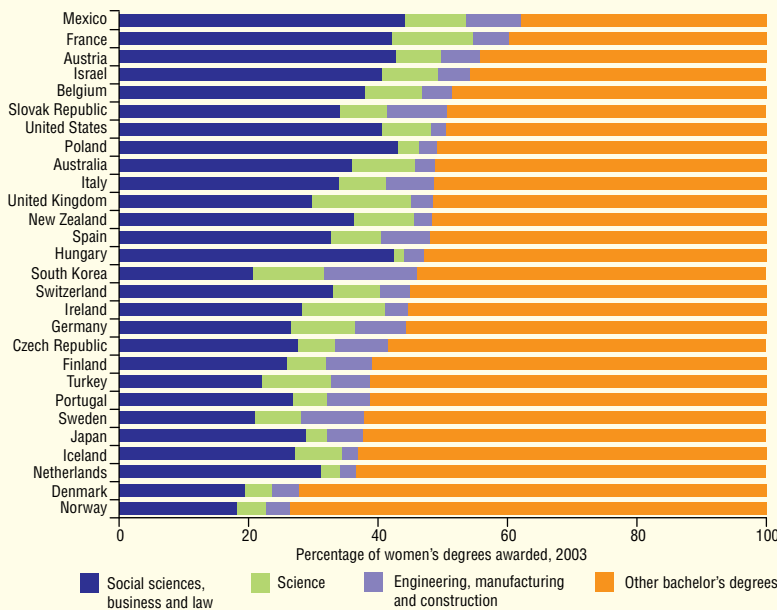
### Women's Businesses

Become your own boss. For generations, that simple dictum has offered a path to economic success. As recently as four decades ago, however, few women seemed inclined to start their own companies. In 1972, women owned only 4.6 percent of U.S. business enterprises (*Chart 7*).

The same generation of women that sought greater educational opportunities also developed an entrepreneurial streak. By 1982, 24 percent of businesses were at least 51 percent owned by women. Their share gradually rose over the next two decades and exceeded 28 percent in 2002.<sup>10</sup> Another 11.7 percent of businesses were equally owned by males and females in 2002, meaning women held a half interest or better in nearly 40 percent of U.S. businesses.

Most women-owned companies are small. About 80 percent took in less than \$50,000 in 2002, and nearly 85 percent had fewer than 10 employees. Family responsibilities or access to capital may limit the size of women's businesses. Another factor may be the industries they've targeted. Almost 94 percent of women-owned businesses are in services, retailing, real estate and wholesale trade, sectors that typically don't exhibit strong economies of scale. Few women-

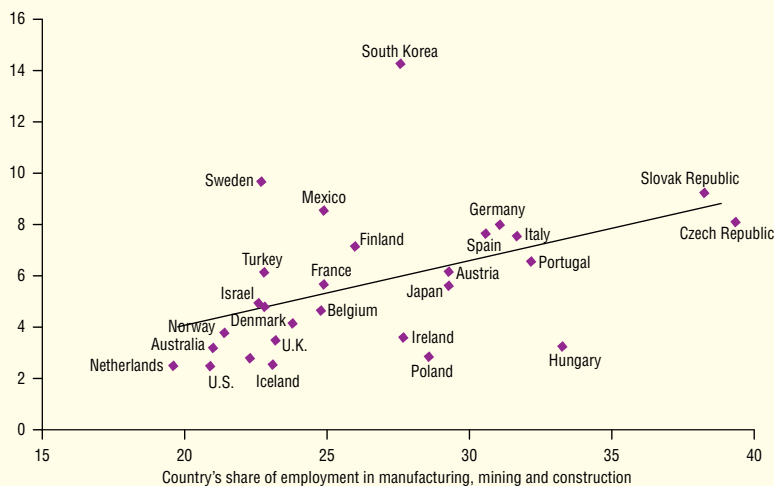
**Chart 5**  
**Where Women Apply Analytical Skills**



SOURCE: Organization for Economic Cooperation and Development, Education Statistics database.

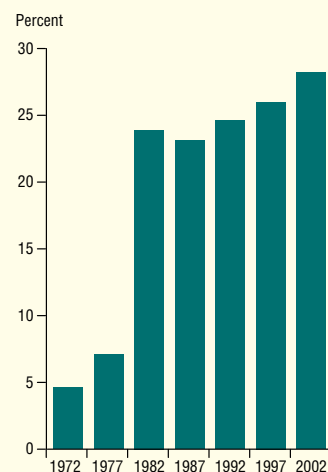
## Chart 6 Industrial Base Encourages Women to Study Engineering

Women engineering, manufacturing and construction bachelor's graduates as share of all women college graduates



SOURCES: Organization for Economic Cooperation and Development, Education Statistics database; World Development Indicators database.

## Chart 7 More Women Becoming Entrepreneurs (Share of U.S. businesses owned by women)



SOURCE: Census Bureau, Survey of Business Owners.

owned firms are in manufacturing, where size often confers distinct advantages.

The corporate world provides an alternate use for many of the skills needed for entrepreneurship. Women have long complained of limited opportunities in business, particularly at the top. That has begun to improve, largely because of the changes women have made in their educational choices. At the same time, many companies have instituted policies and practices aimed at meeting women's needs, including flexible scheduling and other family-friendly policies.

Today, a few women sit at corporate America's pinnacle as chief executives of Fortune 500 companies—among them, Patricia Woertz at Archer Daniels Midland, Indra Nooyi at PepsiCo and Anne Mulcahy at Xerox. In all, 13 of this year's Fortune 500 companies have women chief executives, compared with eight in 2003 and three in 1999.<sup>11</sup> Women's share of seats on Fortune 500 boards

of directors rose from 9.6 percent in 1995 to 14.6 percent in 2006.<sup>12</sup>

These trends show gains, but progress has been slow. Broadening the scope beyond the Fortune 500 shows that women are making bigger strides in the business world. Women held 37.2 percent of U.S. jobs in management occupations, more than double the 17.6 percent of 1972. Nearly a quarter of U.S. chief executives were women in 2005—a total of 391,000. The 1970s data didn't include the category.

### Choices and Consequences

Surveying women's work over the past four or five decades leads to two broad conclusions:

- Women have improved their labor market performance by every measure—participation, education, job distribution, entrepreneurship and management.
- These changes have allowed women to gain ground on men, although they still lag by most measures.

Discrimination dominates much of the discussion of these trends. In this view, women have progressed at work because of declines in some of the barriers that once held them back. Women have been slow to catch up with men because some discriminatory practices remain in place.

Discrimination can't be measured directly. What's more, it can't explain all work-related differences between men and women. Women's choices matter a great deal in how they fare in the labor market—from what they study in school to how they accommodate family responsibilities.

We can see this most clearly by looking at what happens as women change their behavior. They've done this over the past two generations, most notably by making a stronger commitment to staying in the workforce. It has led them to graduate from college at higher rates and study subjects with better job prospects. Women's choices have been a good

fit for the U.S. job market. They've prepared themselves for employment in the growing services sector, with its emphasis on mental rather than physical skills.

Recent decades have seen a revolution in women's work, marked by gains in labor force participation, college study, occupations and entrepreneurship. A commitment to education and work suggests U.S. women will continue to fare better at work, but it's hard to imagine they'll match recent decades' rate of progress.

The growth of their labor force participation has leveled off in recent years, suggesting the surge of women into the job market has run its course. Women's share of business ownership has risen only modestly. With a large portion of today's women already seeking higher education, further increases in the share of college graduates will come only slowly. Women approach or have achieved parity in many professions.

The past 50 years' experience suggests, however, that U.S. women will respond to incentives and opportunities. They've shown a desire to channel their efforts into sectors and occupations that are likely to grow. It's a good formula for further progress in the workplace.

*W. Michael Cox is senior vice president and chief economist and Richard Alm is senior economics writer in the Research Department of the Federal Reserve Bank of Dallas.*

## Notes

The authors thank Julia Carter for providing research assistance.

<sup>1</sup> The baby boom increased the potential number of working women. Adjusting women's labor force participation for changes in cohort size makes the rise steeper—from 30.5 percent in 1948 to 60 percent today.

<sup>2</sup> The wage gap is narrowest for younger workers. Among those 20 to 24, women earn 94 cents for every \$1 men make. For workers 25 to 34, the figure is 89 cents. See "Highlights of Women's Earnings in 2005," Bureau of Labor Statistics, Report 995, September 2006.

<sup>3</sup> "The Gender Gap in Wages, Circa 2000," by June O'Neill, *American Economic Review*, vol. 93, May 2003, pp. 309–14.

<sup>4</sup> South Korea ranks second at 19 percent and the former Soviet Union third at 17.4 percent. College graduates as a share of the U.S. population rose from 8.4 percent in 1960 to 17 percent in 1980 and 25.6 percent in 2000.

<sup>5</sup> Before the 1930s, U.S. women attended college at roughly the same rates as men. Men began their dominance on campus during the Great Depression and increased it after World War II, partly because of the benefits of the GI Bill. See "The Homecoming of American College Women: The Reversal of the College Gender Gap," by Claudia Goldin, Lawrence F. Katz and Ilyana Kuziemko, *Journal of Economic Perspectives*, vol. 20, Fall 2006, pp. 133–56.

<sup>6</sup> "Delayed Childbearing by Education Level in the United States, 1969–1994," by Katherine E. Heck, Kenneth C. Schoendorf, Stephanie J. Ventura and John L. Kiely, *Maternal and Child Health Journal*, vol. 1, June 1997, pp. 81–88.

<sup>7</sup> "Behind the Pay Gap," by Judy Goldberg Dey and Catherine Hill, American Association of University Women Educational Foundation, April 2007.

<sup>8</sup> U.S. payroll employment rose from 71 million in 1970 to 135.4 million in 2006. Goods-producing jobs fell from 31 percent to 16.5 percent, while services employment rose from 68.7 percent to 83.4 percent.

<sup>9</sup> For more information on the evolution of work, see, "A Better Way: Productivity and Reorganization in the American Economy," by W. Michael Cox and Richard Alm, Federal Reserve Bank of Dallas Annual Report, 2003.

<sup>10</sup> The Census Bureau conducts surveys of women-owned businesses every five years.

<sup>11</sup> Katherine Graham of the Washington Post Co. became the Fortune 500's first female CEO when her company entered the list in 1972.

<sup>12</sup> "2006 Catalyst Census of Women Board Directors of the Fortune 500." The Catalyst organization says that it will take 73 years for women to achieve parity with men in service on Fortune 500 boards.

**EconomicLetter** is published monthly by the Federal Reserve Bank of Dallas. The views expressed are those of the authors and should not be attributed to the Federal Reserve Bank of Dallas or the Federal Reserve System.

Articles may be reprinted on the condition that the source is credited and a copy is provided to the Research Department of the Federal Reserve Bank of Dallas.

*Economic Letter* is available free of charge by writing the Public Affairs Department, Federal Reserve Bank of Dallas, P.O. Box 655906, Dallas, TX 75265-5906; by fax at 214-922-5268; or by telephone at 214-922-5254. This publication is available on the Dallas Fed web site, [www.dallasfed.org](http://www.dallasfed.org).



**Richard W. Fisher**  
*President and Chief Executive Officer*

**Helen E. Holcomb**  
*First Vice President and Chief Operating Officer*

**Harvey Rosenblum**  
*Executive Vice President and Director of Research*

**W. Michael Cox**  
*Senior Vice President and Chief Economist*

**Robert D. Hankins**  
*Senior Vice President, Banking Supervision*

*Executive Editor*  
**W. Michael Cox**

*Editor*  
**Richard Alm**

*Associate Editor*  
**Monica Reeves**

*Graphic Designer*  
**Ellah Piña**



FEDERAL RESERVE BANK OF DALLAS  
2200 N. PEARL ST.  
DALLAS, TX 75201