

A person wearing a backpack and hiking gear stands on a rocky mountain peak, facing away from the camera with arms outstretched towards a clear blue sky. The sun is low on the horizon, creating a bright glow and long shadows. The background shows distant mountain ranges under a clear sky.

Does College Matter?

Federal Reserve Bank of San Francisco • 2014 Annual Report



FEDERAL RESERVE BANK
OF SAN FRANCISCO



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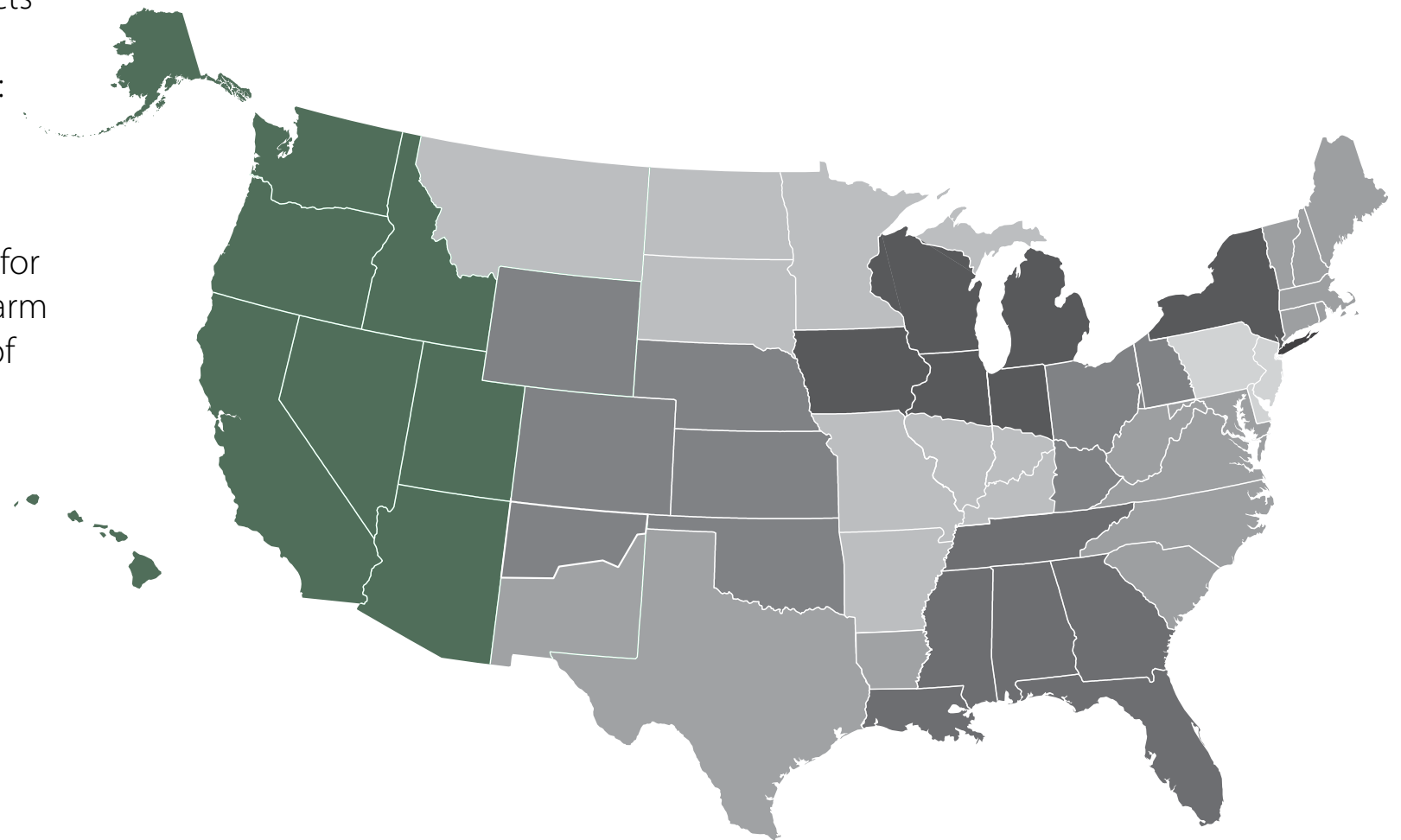
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The Federal Reserve System is the central bank of the United States. It was founded by Congress in 1913 to provide the nation with a safer, more flexible, and more stable monetary and financial system.

The largest of the 12 Federal Reserve Districts by geography and economy, the Twelfth District is comprised of nine western states: Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Utah, and Washington.

In 2013, its 26.4 million workers accounted for about 19 percent of the nation's total nonfarm employment, earning close to 21 percent of the nation's total personal income.



A Letter from the President



John C. Williams

President and CEO of the Federal Reserve Bank of San Francisco

“The foundation of every state is the education of its youth.” “Education is not the filling of a pail, but the lighting of a fire.” “Intelligence plus character—that is the goal of true education.” These are but a few of the seemingly innumerable quotes on one of the most commented-upon subjects in human civilization: Education. Diogenes, William Butler Yeats, and Martin Luther King Jr. have ample company in their commentary, and there is good reason: Education is the foundation of modern societies; it is each nation’s investment in its future laid bare.

Few would deny that education opens up worlds of opportunity. From my personal experience, I have seen how education not only arms people with the skills to find success, but opens minds by exposing students to world views and ways of thinking that are different than their own. From an economist’s perspective, I see the irrefutable data that investing in education is crucial to economic success. There is no such thing as a developed economy that does not educate its people universally; it is a prerequisite to prosperity.

The three essays in this report highlight various aspects of education, though they are by no means exhaustive—a full examination of education would take up far more space than allotted here. Instead, we consider three areas of common discussion and debate: That yes, college is still worth it, that education is constantly changing, and that, done right, one’s education should never end.

Education extends beyond formal teaching or the walls of a classroom. The essays in this year’s report are a commendation of all forms of scholarship and praise of lifelong learning. Or, in the words of Abigail Adams, “Learning is not attained by chance, it must be sought for with ardor and attended to with diligence.”

WATCH VIDEO



A Year of Learning, Transition, and High Performance

On the subject of learning, our centennial commemoration year at the San Francisco Fed was one of change, transition, and knowledge transfer. Mark Gould commenced his role as the Bank's first vice president and chief operating officer. Mark quickly built upon our solid foundation of excellence and formed strong partnerships with our Federal Reserve System colleagues. With Mark's promotion, Susan Sutherland took over as the Seattle Branch manager and Jim Narron was named manager of the System Cash Product Office. Mark, Susan, and Jim's dedication to the Bank and its employees continue our remarkable legacy of performance and public service.

In 2014, our Bank Supervisory staff continued implementing the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act program for large and regional banking organizations. This significant effort involved aligning supervisory plans with new regulations and guidance.

Economic Research staff provided essential support for my role as a monetary policymaker. Statistics staff continued improving the technology platform that streamlines how the Fed monitors the balances banks are required to keep in accounts with us to support the execution of monetary policy.

The Cash Product Office and Information and Technology Services divisions continued development of a new inventory management and workflow processing system for cash operations across the Federal Reserve System. The Cash Product Office also initiated work with commercial banks and armored carriers to identify ways to bring greater automation and efficiency to the cash supply chain.

The San Francisco Fed's cash operations teams in each of our offices exceeded all cost and efficiency targets, and continued to serve as a source of strength and talent for the Cash Product Office. At the national level, cash operations achieved a new record for high speed processing productivity, a result of strong management in each location and close partnership with our information technology and equipment suppliers.

Leveraging the Twelfth District's location at the center of technology and innovation, Information and Technology Services continued to be a key developer of software applications for the Federal Reserve System and a leader in the use of agile software development.

Our Communications and Community Engagement staff focused on advancing policy and practices in community development through targeted research, publications, and public outreach. Community Development staff supported initiatives across the District to foster small business development, improve the financial stability of lower-income households, and strengthen lower-income communities.

I am privileged to work with an extraordinary team of employees who demonstrate their commitment to public service and the values of integrity and innovation each and every day. I sincerely thank all of them for their diligent efforts.

A Legacy of Strong, Insightful Governance

Our Bank is fortunate to be guided by the insights of our boards of directors and advisory councils whose members represent a range of industries and organizations in our region. I would like to extend my thanks and appreciation to them for their invaluable service and counsel during the last year. Their first-hand knowledge and independent assessment of economic and financial conditions throughout the nine western states comprising this District are essential to the formulation of monetary policy.

In particular, I would like to acknowledge the contributions made by Patricia E. Yarrington, vice president and chief financial officer, Chevron Corporation, San Ramon, California. Ms. Yarrington served on the San Francisco Head Office Board of Directors for six years, two as deputy chair and two as chair. Ms. Yarrington also served on this District's Economic Advisory Council.

In addition, I would like to express my sincere thanks and appreciation to the other directors and advisory council members who concluded their terms of service during 2014:

Los Angeles Branch Board: Keith E. Smith, president and chief executive officer, Boyd Gaming Corporation, Las Vegas, Nevada, who served as chairman of the Los Angeles Branch Board for three years.

Portland Branch Board: Roderick C. Wendt, vice chairman, JELD-WEN, inc., Klamath Falls, Oregon, who served as chairman for two years as well as served on the Economic Advisory Council one year as vice chairman; and Brian K. Rice, executive vice president and president of Wealth Management, Aequitas Capital Management, Lake Oswego, Oregon.

Salt Lake City Branch Board: Patrick F. Keenan, chief financial officer, Rio Tinto Kennecott Utah Copper, South Jordan, Utah; and Damon G. Miller, Utah market president, U.S. Bank, Salt Lake City, Utah.

Seattle Branch Board: Ada M. Healey, vice president, Real Estate, Vulcan, Inc., Seattle, Washington, who served as chair for two years; Martha Choe, former chief administrative officer, Bill & Melinda Gates Foundation, Seattle, Washington; and Patrick G. Yalung, regional president, Washington, Wells Fargo Bank, N.A., Seattle, Washington.

Federal Advisory Council: J. Michael Shepherd, chairman and chief executive officer, Bank of the West and BancWest Corporation, San Francisco, California, who served as president of the Council in 2014.

Twelfth District Economic Advisory Council: Alfred A. Plamann, retired chief executive officer, United Grocers, Inc., Commerce, California, who served as chairman and vice chairman of the Council; and Tracey C. Doi, group vice president and chief financial officer, Toyota Motor Sales, USA, Inc., Torrance, California, who served as vice chair for two years.

Twelfth District Community Depository Institutions Advisory Council: John V. Evans, Jr., chief executive officer, DL Evans Bank, Burley, Idaho. John served as chairman from August 24, 2011, through December 31, 2014. Maria P. Kunac, president and chief executive officer, San Diego Private Bank, La Jolla, California; Constance H. Lau, chairman, American Savings Bank, Honolulu, Hawaii; and Darin B. Moody, president and chief executive officer, Utah First Credit Union, Salt Lake City, Utah.

I would like to welcome directors and advisory council members who began their terms of service in 2015:

Head Office Board: Barry M. Meyer, founder and chairman, North Ten Mile Associates, Burbank, California.

Los Angeles Branch Board: Ilyanne Morden Kichaven, executive director, Los Angeles, SAG-AFTRA, Los Angeles, California; and Robert H. Gleason, president and chief executive officer, Evans Hotels, San Diego, California.

Portland Branch Board: Charles A. Wilhoite, managing director, Willamette Management Associates, Portland, Oregon; and Steven J. Zika, chief executive officer, Hampton Affiliates, Portland, Oregon.

Salt Lake City Branch Board: Park Price, president and chief executive officer, Bank of Idaho, Idaho Falls, Idaho; and Patricia R. Richards, president and chief executive officer, SelectHealth, Inc., Murray, Utah.

Seattle Branch Board: Craig Dawson, president and chief executive officer, Retail Lockbox, Inc., Seattle, Washington.

Twelfth District Economic Advisory Council: James A. Beer, executive vice president and chief financial officer, McKesson Corporation, San Francisco, California; Jake Boyer, president and chief executive officer, The Boyer Company, Salt Lake City, Utah; Kevin C. Leader, principal vice president and treasurer, Bechtel Corporation, San Francisco, California; Jacqueline D. Reses, chief development officer, Yahoo!, Sunnyvale, California; and Mary Pat B. Thompson, chief financial officer and senior vice president, MWI Veterinary Supply, Inc., Boise, Idaho.

Twelfth District Community Depository Institutions Advisory Council: Elizabeth J. Dooley, president and chief executive officer, Educational Employees Credit Union, Fresno, California; Gregory Garrabrants, president and chief executive officer, BofI Federal Bank, San Diego, California; C. Alan Horner, chairman, president, and chief executive officer, First Federal Savings Bank of Twin Falls, Twin Falls, Idaho; and Matt C. Packard, president, and chief executive officer, Central Bank, Provo, Utah.



John C. Williams
President and Chief Executive Officer





Does College Pay?



Mary C. Daly
Senior Vice President and
Associate Director of Research
and
Yifan Cao
Research Associate

Balancing Passion with Practicality



Jody Hoff
Senior Economic Education Manager

The Value of Lifelong Learning



John C. Williams
President and CEO

Does College Pay?



Mary C. Daly
Senior Vice President and Associate Director of Research
and
Yifan Cao
Research Associate



Listen to accompanying audio clips to hear stories from people who will help show you that you're on the right path.

In the current job market it's easy to get discouraged and wonder whether the money spent on college will really pay. If you're going to graduate and work for minimum wage, why shell out tuition? And then there are stories of successful people who didn't go to college. Why not take that path?

Behind these extremes are individuals—maybe you—trying to decide if college makes financial sense. Making a good decision requires knowing some basics. Does a college degree translate into higher earnings? Will the extra earnings be enough to pay for your investment? How long will it take to cover the cost? And, do you really need a college degree to climb the economic ladder?

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Javier Quintero

Research Associate
Federal Reserve Bank of San Francisco

The experience of workers with and without a college degree provides clear answers. The boost to earnings from a college degree is large and persistent. The average college graduate earns enough “extra” to recover the cost of attending most colleges in fewer than 15 years. After that, the earnings advantage remains, leaving the typical college graduate with a significant net return. All of this leads to greater economic opportunities over a lifetime, particularly for people who start out in the bottom half of the income distribution.

The College Earnings Advantage

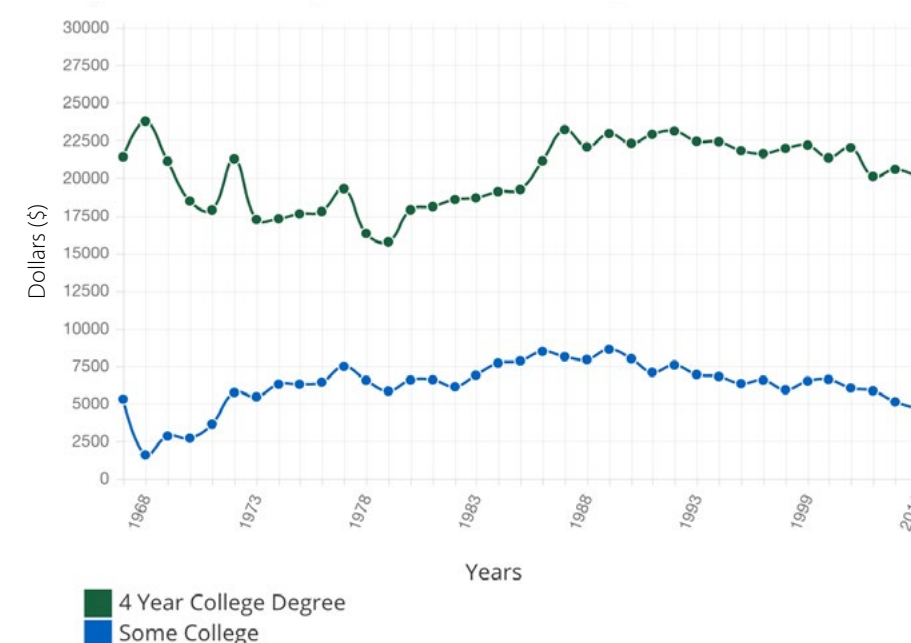
A simple way to see the economic benefit of a college degree is to compare how much college graduates earn relative to high school graduates. Figure 1 shows the annual earnings premium for college graduates relative to high school graduates from 1968 through 2011, adjusted for inflation and based on data from the Panel Study of Income Dynamics (PSID). The payoff from a college degree is apparent. Over the past 40 years, the college earnings premium has averaged about \$20,300 per year. And while the exact value varies over time, college graduates always earn more. At its lowest point in 1980, the premium was about \$15,750 in extra income per year. In 2011, the latest date in our sample, the average worker with a college degree earned about \$20,000 more per year than the average high school graduate. These findings are consistent with other studies (see “For Further Reading” at the end of the essay to learn more).

An important point is that a four-year degree is what really matters, rather than having just some higher education. As Figure 1 shows, the premium is much smaller for workers with some college but no four-year degree.

Did the Recession Change Things?

Recent college graduates will tell you, it’s tough out there. The latest recession was especially hard on young people, and college graduates were not immune. Still, the downturn and its aftermath highlight the *insurance* a college degree provides. College graduates faced unemployment rates about half as high as those for high school graduates. College grads also fared better on pay. Pay cuts were less severe for college grads on average than for other groups. And average hourly earnings point to a [faster recovery in salary growth for college graduates](#) than for high school graduates in 2012 and 2013.

Figure 1
Earnings Premium Over High School Education



Source: PSID and authors' calculations. Premium defined as difference in mean annual labor income.

“The average college graduate earns enough ‘extra’ to recover the cost of attending most colleges in fewer than 15 years.”

It's also important to remember that investing in college, like investing in a house or a business, is a long-term prospect. As Figure 2 shows, new college graduates start out earning just a little more (\$5,000 to \$6,000) than high school graduates. Over time, this earnings gap grows markedly, so that after 15 years it's over \$25,000 per year. This means that comparing the current salaries of recent college graduates with those of people who started working right after high school won't tell you that much about the future. Things will look much different 10, 20, and 30 years from now when the college investment has had enough time to pay dividends. Whether you launch a career in a boom or a recession, a college degree is an asset that becomes more valuable over the course of your work life.

All told, college offers a lot of financial benefits. It delivers higher earnings year to year, provides some insurance against ups and downs in the economy, and translates into greater prosperity over a lifetime of work. And as the audio interviews accompanying this essay demonstrate, the financial benefits are only part of the story.

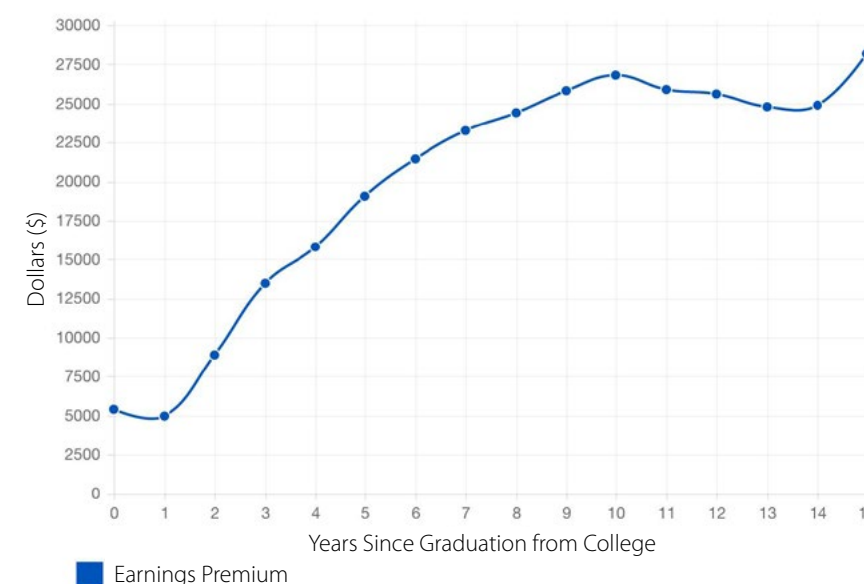
Will the Benefits Cover the Costs?

Around many kitchen tables, the discussion isn't about the value of college, but about how much it costs. In other words, will the benefits justify the expense? The answer is almost always yes. Here's why.

The cost of college is tuition and fees, plus the lost earnings from forgoing work to attend school. The payoff is the discounted accumulated lifetime earnings difference between college and high school graduates. As the box below, [Computing the Return on College](#), shows a graduate paying \$9,000 a year in tuition incurs a total cost of \$112,194 (four years of tuition and fees plus forgone earnings). Assuming that same graduate earns the average premium that comes with a college degree, about \$20,000 per year, the discounted life time benefits would total about \$534,000. Subtracting the costs from the benefits yields a net return on college of over \$420,000.

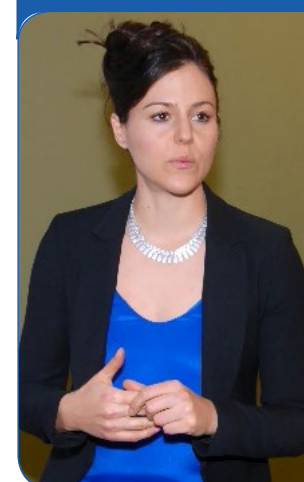
Of course, any individual's return on college depends on the actual costs incurred from attending and the earnings secured after graduation. But for the average person, the calculation is clear: college pays.

Figure 2
College Earnings Premium by Age



Source: PSID and authors' calculations. Premium defined as difference in mean annual labor income of college graduates in each year since graduation and earnings of high school in years since graduation plus four. Values are three-year centered moving averages of annual premiums.

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Early Elias

Business Analyst
Federal Reserve Bank of San Francisco

How Long Will It Take to Earn Back Your Investment?

It is clear that, over a lifetime, college pays. But how long before the investment is in the black? This too is straightforward to calculate. The “breakeven” year—that is, the year when the accumulated earnings premium from college equals the cost associated with graduating—depends on two things: tuition costs and the college earnings premium. Assume the earnings premium is the average paid each year after graduation, as in Figure 2. Figure 3 shows breakeven years for different amounts of annual tuition, again adjusted for inflation and the changing value of money over time.

According to the data, students paying \$9,000 in annual college tuition for four years can break even and begin earning additional returns in nine years. This means that someone who graduates at age 22 and works full-time each year after that will be able to pay for the investment by age 31. From then on, the wage premium that comes with a college degree is extra income that can be spent or saved. It’s important to note that, while \$9,000 may not sound like the astronomical tuitions at some prestigious institutions, it covers about 46 percent of annual admissions at public four-year institutions in 2014, according to the College Board (Table 1). And research finds no definitive evidence that higher tuition leads to superior results for all students (see “For Further Reading”).

Of course, the more college costs, the longer it takes to break even. But, as the figure shows, even when tuition reaches \$45,000 per year, which covers nearly all public colleges and universities in the U.S., the costs can be recouped in 17 years. For those who graduate at age 22, this means the investment is paid in full before age 40.

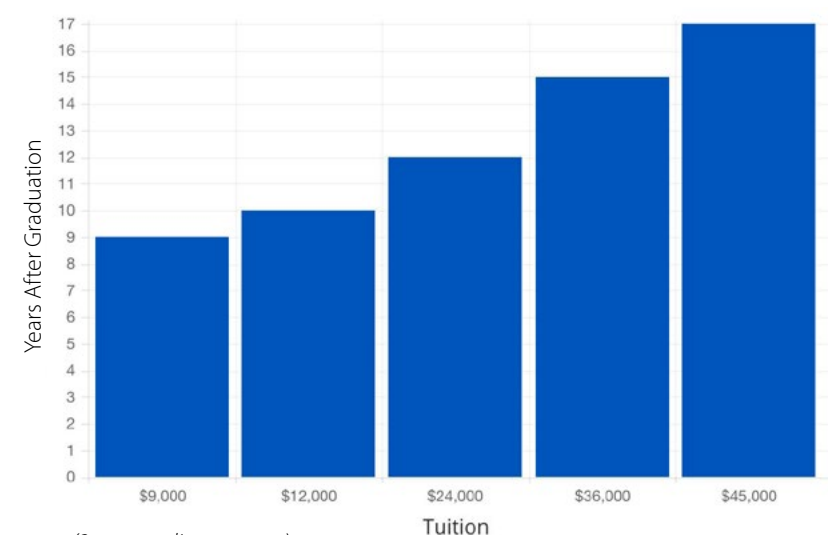
To calculate your own breakeven year, use our [calculator](#), “Is College Worth It?”

Is a College Degree Really Necessary?

Every day we hear stories of people who started at the bottom of the economic ladder and rose to the top through determination, hard work, and talent. This mobility is an important part of our culture and contributes to the vitality of the American economy.

In most cases, it also requires a college degree.

Figure 3
Years to Break Even at Different Tuitions



(2 percent discount rate)

Source: PSID and authors' calculations

Table 1
College Tuition and Fees in 2014

Tuition	Admissions at Nonprofit Four-Year Institutions	
	Public	Private
\$9,000	46%	8%
\$12,000	71%	10%
\$24,000	93%	19%
\$36,000	>99%	61%
\$45,000	>99.9%	83%

Source: PSID, authors' calculations, College Board's "Trends in College Pricing 2014"

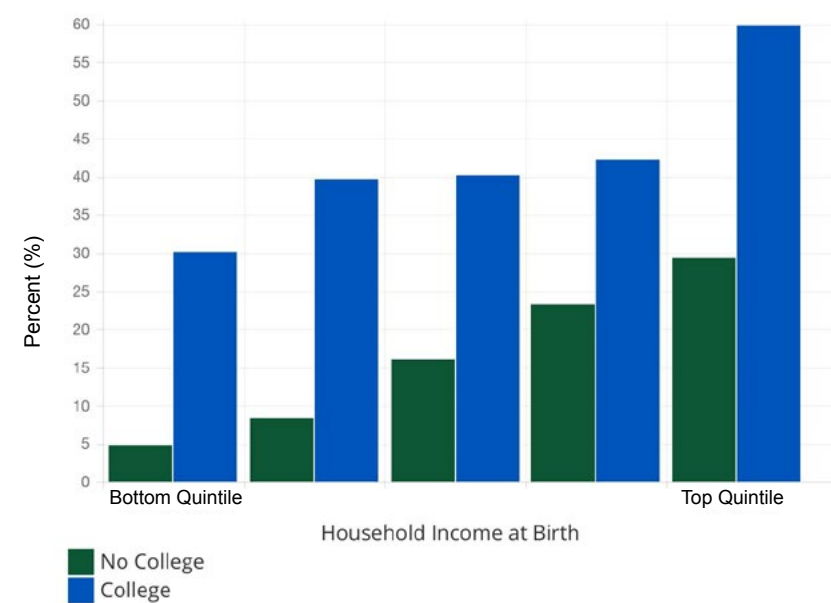
No matter where a person starts, going to college increases the chances of moving up the economic ladder. Figure 4 shows the percent of people who make it to the top 20 percent of the U.S. household income distribution by where they started and whether they went to college. For those born into households near the bottom of the income distribution, a college degree is the difference in reaching or not reaching the top. Graduates from the bottom 20 percent are over six times as likely to reach the top than those who don't go to college. The impact is also striking for those born into the second lowest 20 percent; their chances of getting to the top are five times higher with a college degree. Notably, even those born into the very top of the income distribution are more likely to stay there if they have a college degree. Read more about the role of college in economic mobility in [Daly and Bengali 2013](#), and watch a video on the [San Francisco Fed's Economic Education YouTube Channel](#).

The importance of college is likely to grow in the future. Technology and globalization are making labor markets more competitive. Employers are looking more and more for workers with established skills and credentials. And the well-educated baby boom generation is nearing retirement, which will leave high-skilled positions vacant and increase the demand for college educated workers.

Is College Right for You?

The data tell a compelling story: College is an excellent investment for most people. A college degree comes with higher earnings, some insurance from the ups and downs in the economy, and a path up the economic ladder. In a changing economy, a college degree also provides a strong foundation to build on, whether that means launching a career, starting a business, or pursuing an even higher degree. Without one, success is just harder, at least for most of us.

Figure 4
Chances of Getting to the Top as an Adult



Source: PSID and authors' calculations

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Mary C. Daly
Senior Vice President and Associate Director of Research
Federal Reserve Bank of San Francisco

Computing the Return on College

Deciding whether college is a good investment means weighing the value against the costs of attending.

Costs: tuition + fees + forgone earnings while attending school

Benefits: accumulated earnings difference between college and high school graduates

Since the costs and benefits accrue at different times, an accurate calculation of the net return needs to adjust for the changing value of money over time by taking the discounted net present value. This way, we can compare values from different times on one scale.

Formula for Net Present Value (NPV) for an amount in n years, with discount factor i :

$$NPV_{year\ n} = \frac{\text{Amount}}{(1+i)^n} = \frac{\text{Benefits} - \text{Costs}}{(1+i)^n}$$

Formula for Net Present Value of many values over n years: $NPV_{year\ 0} + NPV_{year\ 1} + NPV_{year\ 2} + \dots + NPV_{year\ n}$

Here is an example:

Jamie pays \$9,000 per year in tuition and fees. If she had not gone to college, she could have worked and earned \$19,887 per year, the average earnings of a high school graduate in 2011 based on the Panel Study of Income Dynamics.

Adding these costs together and taking the present discounted value assuming a discount factor of 2%, the total cost of college is **\$112,194**.

Total Cost = $(\$9,000 + 19,887) \times (1 + r + r^2 + r^3) = \$112,194$,

where r is the percentage of value that remains after each passing year. We calculate r using the discount factor:

$$r = \frac{1}{1+2\%} = \frac{1}{1.02} = 0.9804$$

With a college degree, Jamie earns an average of **\$20,070** more per year over her lifetime than she would have earned had she stopped with a high school degree.

Taking the present discounted value of her college earnings advantage over her 42 years of work (age 23 to 65), she earns a college benefit of **\$533,988**.

Total Benefit = $(\$20,070) \times (r^4 + r^5 + \dots + r^{44} + r^{45}) = \$533,988$

Putting the two together, Jamie's net return on college is **\$421,794**.

Net Return = $\$533,988 - \$112,194 = \$421,794$

Adapted from "[Is It Still Worth Going to College?](#)" by Leila Bengali and Mary C. Daly, *FRBSF Economic Letter* 2014-13.

For Further Reading

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Balancing Passion with Practicality



Jody Hoff

Senior Economic Education Manager

A college education is one of the best investments a person can make. But choosing the focus of that investment can be a daunting task. Add to that the pressure of finding a major that will provide a good living, and it's not hard to understand why this is such a difficult choice.

A new discipline is taking hold on college campuses throughout the U.S. that reaches across majors to combine art with science, innovation with application, and idealism with realism. Growing from just a handful of courses fifteen years ago, entrepreneurship has emerged as one of the fastest growing disciplines in higher education. Located at the intersection of passion and practicality, a course of study in entrepreneurship offers an alternative to settling for an uninspiring major valued in the marketplace, or even skipping college altogether, to pursue a dream.

"A new discipline is taking hold on college campuses throughout the U.S. that reaches across majors to combine art with science, innovation with application, and idealism with realism."

Throw Out the Textbook

Instead of passing on college, potential entrepreneurs are learning the real-world skills needed to launch a start-up while studying subjects that may help them change the world. Understanding that launching a business is distinctly different from managing one, entrepreneurship educators recognized the need for a very different approach—an experience-based approach—that infuses the dynamism and risk-taking of a start-up into the learning environment.

“We’ve learned much more through experience, good and bad, and by talking to people in the real world rather than just sitting in a classroom,” says Aaron Gagleard, co-founder of Bosse Tools, in discussing how he and Founder Stephen Walden are learning how to take their patented 360-degree shovel handle to market.

Nowhere else on campus is there a more dynamic approach to hands-on learning than in the department that teaches entrepreneurship. A number of experience-based activities and support systems are typically offered to help students acquire the skills they need to launch a new enterprise. Among these are student competitions, dedicated campus development space for incubating start-ups, and role model programs.

Student Competitions

Business plan competitions give student entrepreneurs the chance to put their innovative ideas to the test by creating business plans and presenting their ideas for new ventures. Integrating classroom instruction, teamwork, and original ideas, student teams compete to see which venture has the most promise. Pitch competitions take the business plan idea and eliminate everything but the most essential aspects—the problem and the solution. The pitch is then delivered in a tightly timed and exciting forum where judges, instructors, and peers rate the presentations.

Designed to prepare student entrepreneurs for the real life rigors of selling their ideas, competitions provide a supportive but challenging environment in which to validate ideas and practice effective communication. Often, the top-performing teams are provided seed funding for their projects and the chance to advance to regional and national competitions.



“Business plan competitions give student entrepreneurs the chance to put their innovative ideas to the test by creating business plans and presenting their ideas for new ventures.”

Development Space

Students around the country are moving their enterprises out of the dorm room and into an entrepreneur-friendly environment with dedicated work space and ample access to faculty support and community mentors. Often referred to as accelerators, hatcheries, or incubators, these entrepreneurship laboratories are provided rent-free to support and encourage student entrepreneurs. Working alongside other teams, students turn their ideas into reality by experimenting with new designs and fabricating prototypes in these environments.

"I could go on about this program; we're so thankful to the advisors and for the help we've received along the way," says Trevor Bostrom, a student enrolled in the new Boise State University Venture College program. "We have access to great mentors, workspace, and training to help us make Vivid Roots a success." Trevor is co-founder of Vivid Roots, a lifestyle apparel company that supports a social mission by donating 20 percent of their gross profits to clean water projects. Trevor's co-founders are Dylan Carlson, Dallas Crum, and Connor Kingsbury.

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Trevor Bostrom
Co-Founder, Vivid Roots

Role Model Programs

A key strategy endorsed by organizations from the White House to the World Bank is the idea of the entrepreneur role model. For aspiring entrepreneurs, engaging with a successful, established entrepreneur and envisioning themselves as successful has proven time and again to ignite their imaginations. And inspiration is not the only benefit. By working with entrepreneurs in their local communities, the aspiring entrepreneur learns and practices hands-on skills needed to launch and sustain a start-up business.

Divya Nag, a former Stanford University student studying in the Biology department, will tell you that "being at Stanford is unlike being at any other school in the world, in that everyone is always talking about starting companies." When Divya was a sophomore, she left school to found Stem Cell Theranostics, a bio-tech company that developed a method to convert ordinary skin cells into beating heart cells, creating a "clinical trial in a dish." While going through the challenging start-up process, "I realized how important it was to have mentors who have done this before, or who are currently in other companies and can shed some light on their [similar] experiences." Divya went on to found StartX Med, the first nonprofit medical entrepreneurship program for Stanford University scientists.

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Divya Nag
Founder, StartX Med & Stem Cell Theranostics

Get the Ball Rolling

Whether an aspiring entrepreneur wants to hone an elevator pitch, earn a major, or find a specialty for an MBA, education programs in entrepreneurship can be found across the U.S., from the local community college to the most prestigious educational institutions in the country. Schools offer a variety of programs to their entrepreneurial students, often increasing their offerings over time, as the success of these efforts prove the value of investing in future entrepreneurs. There are three general levels of college or university involvement.

Level One: The Basics

At the most basic level, a school may simply offer a few courses in entrepreneurship, including credit and/or non-credit classes, online courses, and certificate programs. The offerings most often are found in the business department and are usually spearheaded by a passionate educator and a supportive administrator.

Fernando Santos, a former graffiti artist who was thinking of starting a business using his own designs, enrolled in one such class at Chabot Community College in Hayward, California. "I signed myself back up to school to further my education," he says. "I was looking through the catalog, and I saw this entrepreneurship course. I said to myself, 'This might be good for me; let me try it out.'" Santos went on to start Beast Oakland, a t-shirt company located in Oakland, California.

"My professor Miguel Colon would always tell us that, of the eight businesses he started, it was the ones that failed that taught him the most. And hey, I had six or seven shirt designs that failed before the one that took off, so I relate to that."

Level Two: A Campus Hub

After offering a few entrepreneurial courses that prove popular and successful, many educational institutions establish an office of entrepreneurship or entrepreneurs' center, typically housed in the business, engineering, or science school. The center becomes the point of contact for students, faculty, and external partners looking for education, resources, and support. As the campus hub for entrepreneurship educational efforts, the center encourages collaboration across academic departments.

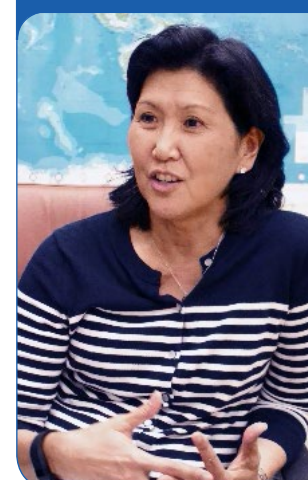
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Fernando Santos

Founder, Beast Oakland

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Susan Yamada

Director, Pacific Asian Center for Entrepreneurship
University of Hawaii, Manoa

"I always say, business school students want to be entrepreneurs, but may not have a great idea. STEM (science, technology, engineering, math) students have great ideas, but they don't know anything about business. So a big part of what we do is bring those two populations together," says Susan Yamada, executive director of the University of Hawaii's Pacific Asian Center for Entrepreneurship.

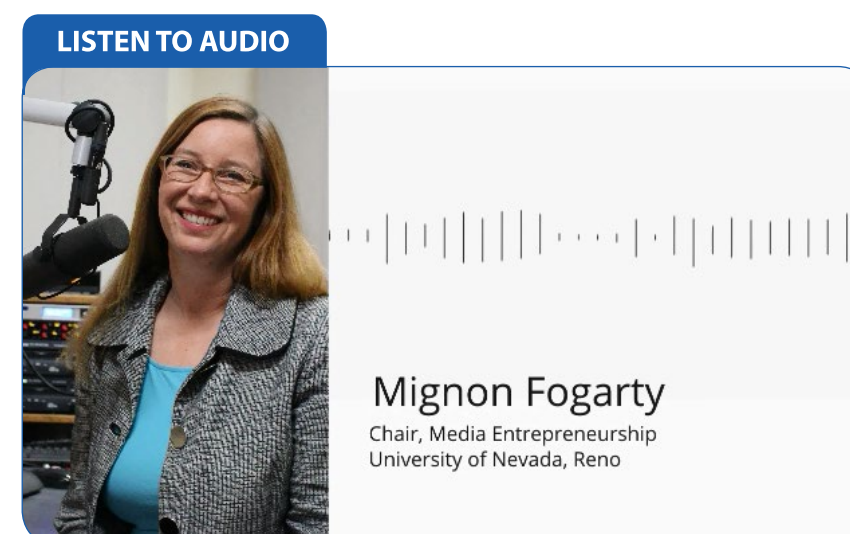
The office of entrepreneurship also fosters relationships with established entrepreneurs in the local community and connects students with business and government enterprises. Schools with a program that have grown to Level Two have made a solid commitment to provide student entrepreneurs with the support services needed to organize and grow their budding enterprises.

Level Three: Interdisciplinary Approach

Schools at Level Three, where entrepreneurship principles are infused into a new, combined curriculum, have the most comprehensive programs for would-be entrepreneurs. These schools permit students to pursue a major in the subject of their choice while simultaneously teaching them how to build a business utilizing their particular specialty. This interdisciplinary approach allows students to pursue their passion and a promising career.

Mignon Fogarty, founder of the successful Quick and Dirty Tips podcast network and host of the popular weekly podcast, Grammar Girl, was hired to fill the new chair in Media Entrepreneurship in the Reynolds School of Journalism at the University of Nevada, Reno. She says her job is to "infuse an entrepreneurial mindset" throughout the journalism department and the broader university. "The best way to learn entrepreneurship is to do entrepreneurship," she points out. Fogarty teaches students media entrepreneurship utilizing her own experiences as an English major who launched a successful media company.

Level Three is the most complex and comprehensive model of entrepreneurship education. It fosters a creative mindset and spirit and establishes entrepreneurship education as a core value. Transcending the idea that the subject is only for business students and faculty, schools at Level Three provide opportunities for all would-be entrepreneurs, from engineering to fine arts.



"... schools permit students to pursue a major in the subject of their choice while simultaneously teaching them how to build a business utilizing their particular specialty."

Level Three programs typically offer student competitions, development space for start-ups, and commercialization programs. At this level, opportunities for learning entrepreneurship are part of a comprehensive suite of university-wide, wrap-around services dedicated to bringing student ideas to market. Both Arizona State University, which continues to nurture Bosse Tools through its Edson Accelerator program, and Stanford University, which hosts StartX Med, are examples of this comprehensive approach.

The Choice

Choosing whether to run with an entrepreneurial idea instead of attending college used to be a dilemma. So was having to choose between majoring in a subject you loved versus a subject likely to land you a good job after college. These tough decisions are not entirely eliminated, but the new discipline of entrepreneurship can help ease the difficulty by combining innovative and engaging options with a college education. Finding a program that fits into the plans of almost any aspiring entrepreneur is an exciting venture in itself, one that turns a difficult decision into an inspiring opportunity.

"Finding a program that fits into the plans of almost any aspiring entrepreneur is an exciting venture in itself, one that turns a difficult decision into an inspiring opportunity."

For Further Reading

Kauffman Foundation. 2008. ["Entrepreneurship in American Higher Education: A Report from the Kauffman Panel on Entrepreneurship Curriculum in Higher Education."](#)

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The Value of Lifelong Learning

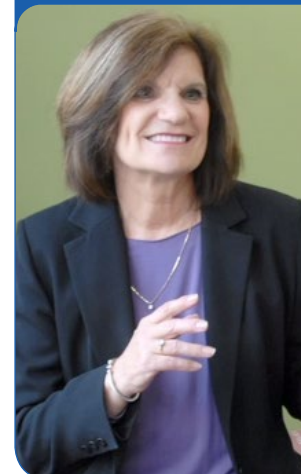


John C. Williams
President and CEO

The previous two essays have laid out the arguments for investing in education and following new career paths, supported by solid data, research, and interviews. One might expect that, as an economist, I would follow suit with an extended investigation of the return on investment of education, replete with detailed charts and tables, and an alphabet soup of equations. Normally, this would be the case. But for this year's essay, I decided to take the path less travelled—or, at least, the one less travelled by policy-wonk economists—and offer my own views about the value of education, in the formal sense, certainly, but more importantly, as the foundation of lifelong learning.

Education doesn't stop at the last final exam. The arc of one's life, and indeed one's career, is determined by how we continue to learn. To believe that the course of university study arms us with the tools to fully participate in adult life without constant update is to make a critical mistake. Our formal education prepares us with many mechanisms with which to approach life in the "real world." Some of these are practical skills, some

LISTEN TO AUDIO



Maria Adair-Chulski
Account Executive
Federal Reserve Bank of San Francisco

are the intellectual preparedness to take on a new job or career, and some appear to have no impact, other than to have offered some diversion during college or high school. But even the lessons that do not appear to have a pragmatic purpose are vital to our success in later life. They teach us to see the world differently and thus view obstacles from several perspectives and approach them from different angles. They're important because they teach us how to think, not what to memorize. And that is key if we are to push ourselves to continue learning and be open to new ideas.

Even in a profession as seemingly mundane as economics, the field is always changing. I once was speaking to a group that included students of a former professor of mine. I flattered my former teacher that he'd taught me "everything I know" about the day's topic. He retorted that he hoped that wasn't true; he'd be alarmed if I'd failed to learn anything new on the subject in the intervening 25 years.

Of course, he was right, and neither I nor any other economist would claim that we've learned everything and can give up studying. New models, data, and methods of analysis are constantly emerging. The most skilled economists are those who can adapt to new ideas and new ways of thinking, because no one—not economists, not computer programmers, not teachers—will be doing the exact same job in five years' time, let alone 30. Indeed, the term "creative destruction"—the idea that progress by its very nature destroys economic structures as innovation makes old models obsolete—was coined by an economist. Like everyone else, we must adapt to the changing world in which we operate.

The groundwork for evolving along with one's profession is not laid in the rote learning of new technologies or equations, but in the critical thinking imparted by those lessons seemingly unrelated to the practicalities of our chosen trades. Perhaps a physicist doesn't draw a direct link between her English classes and life in the lab. Maybe a computer programmer fails to find the connection between philosophy and coding. But all learning is a part of our intellectual and professional success. These disciplines, often considered the "soft" studies are anything but, and they foster the ability to think strategically, to parse ideas, and to question embedded hierarchies that make the mind agile enough to not only adapt to technological advances, but also to embrace new thinking.



"Indeed, the term 'creative destruction'—the idea that progress by its very nature destroys economic structures as innovation makes old models obsolete—was coined by an economist."

This is not a novel idea. The concept of well-rounded learning harkens back to classical antiquity, when education in seven liberal arts was considered essential for a truly educated mind. Those same subjects were vital to the Medieval founders of the modern university system, who grouped those disciplines under the auspices of the trivium—grammar, logic, and rhetoric, used to sharpen critical-thinking skills—and the quadrivium—arithmetic, geometry, astronomy, and music, whose foundation was the study of numbers. It was believed that the knowledge of these arts laid the groundwork for all areas of study and the pursuit of each aided in the mastery of the others. This is more than high-minded pedantic philosophy: modern science has borne this theory out again and again. The seven arts were eventually joined by an expanded roster of subjects, but the fundamental theory that a full educational offering strengthens the intellect remained. That’s why, as an economics major, I was expected to take language, history, and science classes, or why the math majors had to fulfill humanities and social sciences requirements.

The message in this is not that one should rush out and take an astronomy class—though that may be beneficial, and undoubtedly fun. As it happens, I did take astronomy classes as a student at Berkeley, and I can attest that they were both beneficial—I learned methods of investigation and ways of thinking that were different from those in my economics and political science classes—and very enjoyable. The point is that the mind is sharpened by education and experiences outside our own spheres of familiarity. The more adaptable we become, the more open we are to new ideas and perspectives. We have the great benefit of living in an incredibly diverse country, populated by people with different cultures, experiences, and backgrounds from our own. To some extent, we are living in our own university. One of the most important aspects of lifelong learning, and one of the greatest benefits of exercising the mind, is that it fosters creativity. As the president of the Federal Reserve Bank of San Francisco, I would be remiss if I did not point out not only the vast array of industries that call the Twelfth District home, but the central role innovation has played in them, from technology and biotech to agriculture and financial services. Innovation comes from inspiration and invention, but also in combining existing ideas in new and creative ways. Learning about other cultures and societies can foster that kind of creative process, and it is clear to me that the Twelfth District is a hub of innovation in large part because of its diversity, and that we continue to draw talent here for the same reason.

“... it is clear to me that the Twelfth District is a hub of innovation in large part because of its diversity, and that we continue to draw talent here for the same reason.”

The pursuit of lifelong learning takes more than preparedness, more than intellectual curiosity, and more than critical thinking...it also takes willingness and fearlessness. The former Federal Reserve Chair Ben Bernanke once spoke of his own experience leaving academia for public service and noted that once we have settled into our comfort zones, or managed to tick those myriad accomplishments off the to-do list, it's time to take on new challenges.

He's right, and in whatever profession we've chosen, it is up to us to continue to challenge ourselves and make learning a part of our everyday lives. I would add my own advice that failure is an inevitable part of life and most often a prelude to success. Rome wasn't built in a day and neither was the iPad, space shuttle, or modern medical treatments. There were countless failures and missteps along the way, and those provided their own form of learning.

In excelling in whatever it is we do, we wade into uncharted waters. But if we've done it right, we know that we have been equipped with the ability to navigate our way with the critical thinking gleaned by our education; the adaptation founded on the ability to think differently; the ability not just to learn from mistakes, but to bounce back when we make them; and our willingness to keep learning. All of this is lifelong learning, and none of us can succeed without it. ■

"... once we have settled into our comfort zones, or managed to tick those myriad accomplishments off the to-do list, it's time to take on new challenges."



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as of January 1, 2015

Boards of directors of the Reserve Banks and Branches provide the Federal Reserve System with a wealth of information on economic conditions in every corner of the nation. This information, along with other sources, is used by the Federal Open Market Committee and the Board of Governors when reaching decisions about monetary policy.

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as of January 1, 2015

Established May 1985

The Twelfth District Economic Advisory Council is a source of information on current and pending economic developments in the Twelfth District. The members provide observations, opinions, and advice to members of the boards of directors and management of the Federal Reserve Bank of San Francisco. The Twelfth District Economic Advisory Council members reside within the nine state District of this Reserve Bank.

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Twelfth District Community Depository Institutions Advisory Council

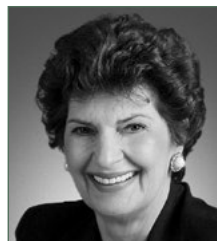
as of January 1, 2015

The Twelfth District Community Depository Institutions Advisory Council (CDIAC) serves as an important source of information about the ability of community depository institutions to support local markets in the District. Members reside in the nine-state region of the Twelfth District and provide observations, opinions, and advice to management of the Federal Reserve Bank of San Francisco and members of the Board of Governors of the Federal Reserve System. The chairman represents the Twelfth District at CDIAC meetings held by the Board of Governors twice a year in Washington, D.C.

Chair



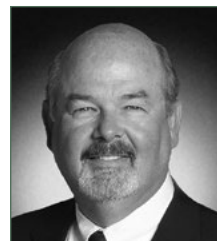
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* Janet A. Garufis, Chair of the District CDIAC, represents the District at the Board of Governors' CDIAC meetings



Financial Statements

2014

Auditor Independence

The Federal Reserve Board engaged Deloitte & Touche LLP (D&T) to audit the 2014 combined and individual financial statements of the Reserve Banks and Maiden Lane LLC¹.

In 2014, D&T also conducted audits of internal controls over financial reporting for each of the Reserve Banks. Fees for D&T's services totaled \$7 million, of which \$0.4 million was for the audit of Maiden Lane LLC. To ensure auditor independence, the Board requires that D&T be independent in all matters relating to the audits. Specifically, D&T may not perform services for the Reserve Banks or others that would place it in a position of auditing its own work, making management decisions on behalf of the Reserve Banks, or in any other way impairing its audit independence. In 2014, the Bank did not engage D&T for any non-audit services. The Bank leases office space to Deloitte LLC.

View the Federal Reserve Bank of San Francisco's 2014 financial statements,
along with financial statements for the entire Federal Reserve System, at:
<http://www.federalreserve.gov/monetarypolicy/files/BSTSanFranciscofstmt2014.pdf>

¹ In addition, D&T audited the Office of Employee Benefits of the Federal Reserve System (OEB), the Retirement Plan for Employees of the Federal Reserve System (System Plan), and the Thrift Plan for Employees of the Federal Reserve System (Thrift Plan). The System Plan and the Thrift Plan provide retirement benefits to employees of the Board, the Federal Reserve Banks, the OEB, and the Consumer Financial Protection Bureau.



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Design: Beau Kelsey, User Experience Design Center

Photography: Mark Compton Photography

Is College Worth It?

College Calculator: Leila Bengali, Yifan Cao, Mary C. Daly, and Jody Hoff

**Thank you to the
following departments:** Accounting, Communications and Community Engagement, Economic Research,
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