



Training for Success

A Policy to Expand Apprenticeships in the United States

By Ben Olinsky and Sarah Ayres November 2013

Center for American Progress



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Introduction and summary

Apprenticeships are not a familiar concept to many Americans, but expanding the use of this highly effective training model can help our nation meet the demand for skilled workers, create pathways to well-paying careers for unemployed young workers, and give American businesses a competitive edge in the global marketplace. Apprenticeships have been a tried and true method of educating and training workers since the Middle Ages, and they continue to enhance productivity and boost workers' earnings in many countries around the world today. At a time when too many American workers lack the education and training to secure well-paying, middle-class jobs, and American businesses increasingly rely on high-skill workers to innovate and expand, we believe that apprenticeships hold great promise for addressing our nation's economic challenges. In this report, we will discuss America's insufficient workforce training system, demonstrate that apprenticeships are a time-tested solution to our workforce training challenges, and propose a set of policies to expand apprenticeships while addressing the reasons they have not yet been widely adopted in the United States.

An apprenticeship is a job in which an individual is paid to learn a set of skills through on-the-job training. In the United States, a formal system of “registered apprenticeships” was created in 1937 by the National Apprenticeship Act¹ and is overseen by the U.S. Department of Labor and the individual states. Under the system, a sponsor of an apprenticeship registers its program and its apprentices with the federal government or a delegated state agency. For each “apprenticeable” occupation, a set of requirements details the duration and/or competency standards necessary for completion. When an apprentice completes these requirements, the government issues a certificate of completion that then serves as a nationally recognized portable credential.

Despite the existence of a formal registered apprenticeship system in the United States, the training model is not widely used or understood by American workers or businesses. America had 358,000 active registered apprentices in 2012—only 7

percent of the number of apprenticeships in England when adjusting for population size.² Apprenticeships are also a key conduit for many German and Swiss young adults to enter the workforce.

In the United States, registered apprenticeships last between one and six years, with an average of four years. The requirements for completing an apprenticeship may be time-based, competency-based, or a hybrid of the two. Apprenticeships typically include 2,000 hours of on-the-job learning and a minimum of 144 hours of classroom-based instruction each year. The classroom-based instruction is often conducted at local community or technical colleges or other vocational schools. Unlike internships, in which individuals work for little or no money and rarely receive formal training, apprenticeships follow an “earn-while-you-learn” model. They are real jobs with extensive on-the-job and classroom-based training and wages that go up as skills are mastered.³

Apprenticeships are run by employers, employer associations, and labor-management organizations. The costs of apprenticeships are usually borne almost entirely by their sponsors, who pay for an apprentice’s wages, all on-the-job training costs, and often much of the tuition for their classroom instruction. In the case of joint labor-management programs, both groups make significant investments: Each year, building trades unions and their partner contractors invest more than \$1 billion in apprentice and journey-level training, tens of millions of dollars more in construction training plants and equipment, and \$10 billion in apprentice wages and benefits.⁴

In exchange for this investment, employers receive a pipeline of skilled workers steeped in the culture of their firms and who exhibit strong loyalty to their sponsors. In a number of states, employers may also qualify for tax breaks or other subsidies. A number of federal workforce funding streams may also be applied toward the costs of an apprenticeship.

Expanding the U.S. apprenticeship system would help strengthen our economy, as research shows that the United States is not producing enough skilled workers to meet our future economic needs. By 2020, America is projected to experience a shortage of 3 million workers with associate’s degrees or higher and 5 million workers with technical certificates and credentials.⁵ Compounding our inadequate workforce development system, research shows that employers are now spending less on training than they have in the past. At the same time, industry surveys show that a lack of qualified workers is a top concern for many employers.⁶

Apprenticeships can help meet the demand from businesses, while offering workers higher wages and better employment outcomes. Evidence on the effectiveness and return on investment for apprenticeships is strong—they are overwhelmingly recommended by employers and lead to significant increases in lifetime earnings and benefits of up to \$300,000 for workers.⁷

But expanding apprenticeships will require overcoming a number of hurdles that have thus far prevented their broader adoption in the United States. Businesses must take on significant costs to hire apprentices and are frequently unaware of the benefits they will gain in return. Similarly, workers are unfamiliar with the range of occupations, educational requirements, and salaries associated with apprenticeships. Despite efforts to diversify, apprenticeships remain largely the domain of men in traditional trades such as construction. Our disjointed national system of administering apprenticeships makes it difficult to collect data that would better inform their use and hinders the development of a uniform credentialing system that would provide the most benefit to workers and employers. Finally, unions have invested significant resources into developing high-quality apprenticeship programs through joint apprenticeship committees; a broad expansion of apprenticeships into new sectors and nonunionized workplaces would face the challenge of moving forward without that significant expertise and support.

In this report, we outline a set of policy recommendations that, if implemented, will address these challenges and set the stage for a large-scale expansion of apprenticeships in the United States. We recommend improvements to marketing efforts to generate demand from businesses, tax incentives to help businesses defray the cost of training apprentices, and competitive grants to support promising public-private partnerships. We recommend improving access to workers by establishing an online database of openings and launching an initiative to bring recent high school graduates into apprenticeships. And we recommend improvements to research and data collection that will enhance our understanding of the economic benefits of apprenticeships and how to expand their reach to women and workers in nontraditional occupations. We believe that our proposals can connect workers to good jobs, enable businesses to boost their productivity, and offer taxpayers a high return on investment.

Our education and training system is not sufficient

The U.S. education and training system is not on pace to meet future workforce demands, with damaging consequences for workers, businesses, and America's global competitiveness. Academic and industry analyses have shown that the United States is on track to experience a shortage of skilled workers within the next decade, as our economy increasingly requires workers to have some formal education or training after high school. Expanding the share of workers with postsecondary credentials, such as those acquired through apprenticeships, will lead to higher wages and better opportunities for American workers, more productive and profitable American businesses, and a stronger American economy.

Businesses need skilled workers

A number of analyses conducted over the past several years have raised the concern that the United States is not producing enough skilled workers to meet the growing demand. An analysis by the Georgetown University Center on Education and the Workforce finds that the United States is on track to experience a shortage of 3 million workers with associate's degrees or higher and about 5 million workers with technical certificates and credentials.⁸ This shortage is due to the increasing share of jobs that require some form of postsecondary education. Consider that in 1973, just 28 percent of jobs required postsecondary education. That number jumped to 59 percent in 2008 and is predicted to reach 65 percent in 2020.⁹ To be clear, these jobs are not just for graduates of four-year colleges. One-third of jobs will not require a four-year bachelor's degree but will require some level of postsecondary education or training, such as an associate's degree, technical certificate, or industry credential—exactly what can be offered through an apprenticeship.¹⁰

Despite this trend, too many Americans today are leaving education and training with a high school diploma or less. Consider that while 30 percent of jobs in 2020 will require an associate's degree, certificate, or some college, only 28 percent of adults today have that level of postsecondary education.¹¹ While 28 percent may seem relatively close to 30 percent, these figures translate into a sizable 3-million-worker shortage nationally. Failing to provide better opportunities for workers to obtain education and training beyond high school is bad for businesses in myriad ways, as we detail below.

Employers report that they are struggling to fill jobs

In ManpowerGroup's 2013 Talent Shortage Survey, almost half (48 percent) of U.S. employers responded that they have a hard time filling jobs because candidates lack technical competencies.¹² The Business Roundtable found that 61 percent of employers surveyed in June to July of 2009 had a hard time finding skilled workers to fill vacancies¹³—at the height of the Great Recession. And when Deloitte surveyed American manufacturing companies in 2011, two-thirds reported that they were experiencing a moderate or severe shortage of qualified workers, especially among skilled production workers such as machinists, operators, craft workers, distributors, and technicians.¹⁴ To be clear, the severity or existence of a skills gap varies widely by industry. The persistently high rate of unemployment in the construction industry, for example, makes clear that it is not suffering from a skills gap.¹⁵

Improving the skills of U.S. workers will boost business and help grow the economy

In 2012, Deloitte found that there were 600,000 unfilled manufacturing jobs in the United States—"simply because employers cannot find people with the skills they need." Furthermore, 74 percent of manufacturers indicated that employee shortages or inadequate talent were limiting expansion or increased productivity. Deloitte further estimated that closing the skilled-worker gap in manufacturing could lead to the employment of an additional 3.85 million workers: 600,000 unfilled jobs due to the skills shortage, 500,000 jobs from manufacturing growth, and 2.75 million new jobs in related industries.¹⁶

Failure to act now will result in a serious shortage of skilled workers

While few economists believe that today's shortage of skilled workers is causing America's sluggish economic recovery and high unemployment rate, the United States is on track to experience a more critical shortage of skilled workers in the not-so-distant future. A recent analysis by the Boston Consulting Group, or BCG, was more optimistic in the short run, estimating that the United States may only be currently short by about 80,000 to 100,000 skilled manufacturing workers, but it also found that the skills gap will soon become a serious problem if not addressed. The average age of a high-skill manufacturing worker is 56 years old; as those workers begin to retire, BCG estimates that the shortage of highly skilled manufacturing workers could worsen to approximately 875,000 machinists, welders, industrial-machinery mechanics, and industrial engineers by 2020.¹⁷

More broadly, among the 30 occupations with the largest projected employment declines between 2010 and 2020, only three occupations typically require a postsecondary degree or nondegree award, and only two additional occupations typically receive long-term on-the-job training. Conversely, among the 30 fastest-growing occupations between 2010 and 2020, 17 required a postsecondary degree, and four additional occupations typically require training through an apprenticeship.¹⁸

Moreover, businesses are not playing the large role in training workers that they once did. American companies today invest about half as much in training as they did a decade ago.¹⁹ Certain industries have experienced dire consequences as a result of declining employer investment; a RAND analysis attributes the decline of the U.S. machine-tool industry in part to firms' disinvestment in worker training and "the collapse of the apprenticeship system that was the main source of skilled labor."²⁰ Given the combination of our nation's inadequate workforce training system and growing employer disinvestment in worker training, it is not surprising that America is facing a looming skilled-worker shortage that will have consequences for workers, businesses, and America's long-term economic growth and competitiveness.

Workers benefit from postsecondary education and training

Workers who don't gain the skills and credentials they need to get good jobs in high-growth industries will face dwindling job prospects, lower wages, and fewer opportunities to join the middle class. Just as the demand for middle- and high-skill workers is growing, the opportunities available to low-skill workers are diminishing. While 40 percent of adults today have a high school diploma or less, only 36 percent of jobs in 2020 will be available to them.²¹

Workers without a postsecondary degree already earn lower wages and face higher rates of unemployment than their more educated peers, and we can expect those disadvantages to worsen as the number of jobs available to them declines. Workers with a high school degree or less earn less than workers with postsecondary education and are more likely to be in a lower income class. And 10.7 percent of workers over the age of 25 with a high school degree or less are unemployed, compared to the overall unemployment rate of 7.6 percent.²²

To make matters worse, low-skill workers are less likely to receive employer-provided training than high-skill workers. The percentage of low-skill workers who received employer-provided training between 1995 and 2001 dropped from 22 percent to 20 percent, even as the percentage of training resources going to those with a bachelor's degree increased from 50 percent to 54 percent.²³ Not only do low-skill workers face fewer opportunities and worse jobs than high-skill workers, but our lopsided education and training mechanisms serve to exacerbate the divide by concentrating investments in workers with high levels of human capital.

Unfortunately, significant barriers deter workers from seeking out additional education and training. According to the Springboard Project's American Workforce Survey, the greatest barriers to participating in education and training are convenience, cost, customization, and accreditation.²⁴ The cost barrier is twofold: In addition to the high cost of tuition, attending a full-time postsecondary program means forgoing a full-time income during that period. Additionally, for unemployed workers in many states, a postsecondary education or training program is likely to last longer than an individual can continue to receive unemployment benefits and means additional expenses they may not be able to afford—even if that training is critical to finding new work.

Moreover, the cost of postsecondary education has skyrocketed in recent years, while government support has eroded significantly. Thanks in part to disinvestment at a state level, tuition and fees for public four-year colleges have gone up 289 percent in the past 40 years, from \$2,225 in the 1972-73 academic year to \$8,655 in 2012-13, after adjusting for inflation.²⁵ The inflation-adjusted cost of attending a public two-year college also went up 146 percent, from \$1,274 in 1972-73 to \$3,131 in 2012-13, in 2012 dollars.²⁶ At the same time, the Pell Grant, which provides funding to low-income undergraduates to pay for their education, has significantly eroded in buying power. In 1979, the maximum Pell Grant covered about three-fourths of the total cost of attending a public four-year college; today, it covers only 31 percent of the cost for tuition, fees, room, and board.²⁷ Consequently, 37 percent of surveyed workers cite cost as a barrier to attaining postsecondary education, including half of respondents earning less than \$50,000 a year.²⁸

And workers are increasingly growing wary of massive student debt. In 2010, student debt owed by Americans exceeded credit card debt for the first time,²⁹ and it has now surpassed \$1 trillion.³⁰ In October 2012, the average member of the class of 2011 held \$26,600 in student debt.³¹ And in a survey of young adults, nearly three out of four respondents said that graduates bore unmanageable amounts of student-loan debt.³²

Additionally, workers aren't necessarily choosing to train in fields that are high growth, and yet they bear all of the risk for having invested in training in the wrong field. According to the Business Roundtable, 41 percent of surveyed workers are unsure of what skills will be required in the future and if training will pay off.³³ This lack of knowledge can put off prospective students, who might choose to forgo postsecondary education entirely. It can also, without adequate counseling at the beginning of a postsecondary program, lead students to pursue studies in fields with fewer job prospects. Indeed, in a separate survey by Accenture, 41 percent of college graduates from the last two years report working in jobs that do not require a degree, and 11 percent are currently unemployed—more than half since graduation. Almost two-thirds (63 percent) believe they need additional training to get their desired job, and nearly half said they would have fared better in the job market with a different major. When 2011 and 2012 college grads not employed in their field of study were asked why, 32 percent said there were not enough job openings in their field.³⁴

Apprenticeships can help meet the demand for skilled workers

Apprenticeships are a particularly successful training model, combining classroom education and on-the-job learning. While apprenticeships are widely used in other countries, their reach has so far been limited in the United States. We believe that expanding apprenticeships in the United States can play an important role in meeting the demand for skilled workers, improving wages and economic opportunities for workers, boosting U.S. business, and bolstering America's competitiveness in the global economy.

Apprenticeships benefit workers

Apprenticeships are real jobs and workers earn a paycheck during their apprenticeship—typically starting at 50 percent to 60 percent of their eventual professional wages.³⁵ Additionally, an apprentice's wages go up as they progress through the program and master additional skills. Because training is part of their job, participants do not have to forgo income from employment, thus one of the key barriers to receiving additional training is surmounted. For individuals who are unable or unwilling to take time out of the labor market to pursue postsecondary education, an apprenticeship can be the perfect fit. Additionally, for the unemployed worker who needs to upgrade his or her skills to find a job, an apprenticeship means an immediate job, steadily rising wages, and an entrée into a successful and sustainable long-term career.

Apprenticeships dramatically raise workers' wages from the moment they finish training and continue to benefit them throughout their careers. The Department of Labor has noted that workers who complete an apprenticeship earn an average starting annual salary of \$50,000.³⁶ And in the most comprehensive research to date, analysts conducted a cost-benefit analysis of registered apprenticeships in 10 heterogeneous states for the Department of Labor's Employment and Training Administration and found that apprenticeships confer both short- and long-term benefits to workers. The states were selected to run the gamut of a number of key fac-

“Workers who complete an apprenticeship make an average of \$240,037 (\$301,533 including nonwage benefits) more than comparable job seekers in their lifetimes.”

tors, including program size, geographic region, and levels of union representation. The study found that the estimated earnings of workers who participated in apprenticeships would be \$98,718 more over their lifetimes than similar nonparticipants; workers who complete an apprenticeship make an average of \$240,037 (\$301,533 including nonwage benefits) more than comparable job seekers in their lifetimes.³⁷

Apprentices get hands-on career training in industries with a demonstrated need for skilled labor. Employers sponsor apprenticeship programs because they know they need a pipeline of skilled workers to fill anticipated job openings. Put another way, because employers (or joint management-labor organizations) bear the costs of apprenticeships, they are unlikely to take on an apprentice if they don't expect that there will be a job for them at the completion of the program. The data bear this out: Of those apprentices who complete their training, 87.4 percent were employed shortly after finishing their program, and of those 87.9 percent were still employed six months later.³⁸ Looking forward, occupations that typically incorporate apprenticeships are projected to grow by 22.5 percent by 2020, faster than for any other on-the-job training category.³⁹

Apprentices get an education, with little or no educational debt. In many cases, apprentices can receive college credit, and even an associate's degree, for their coursework and on-the-job training. In fact, about one-quarter of apprentices report having participated in a community college or vocational program in the last year, and an additional 30 percent report having taken a nondegree course.⁴⁰ Apprenticeships also offer an alternative to fully classroom-based education, as much of the learning occurs on the job rather than in a classroom.

Apprentices receive national industry certification that is portable and valuable anywhere in the United States, ensuring that their skills are transferable to other companies and industries. The Washington State Department of Labor and Industries calls the apprenticeship completion certificate "one of the oldest, most basic, and most highly portable industry credentials in use today."⁴¹ Apprentices receive a certificate of completion from the Department of Labor or a state apprenticeship agency when they finish a registered apprenticeship, and this certificate is recognized by employers throughout the nation. Programs can now also offer interim credentials along the way that certify an apprentice's competency in specific skills and ultimately lead to a certificate of completion.⁴²

Apprenticeships benefit businesses

Employers who sponsor apprentices gain skilled workers, reduce turnover, and improve the quality of work overall as all workers serve as teachers and mentors to apprenticeship students.⁴³ Apprenticeships help businesses address any critical or expected shortages of skilled labor, while training future workers to their own specifications. They help inculcate apprentices with the culture of their sponsors and tend to breed long-term loyalty.

Nearly all employers who sponsor apprenticeship programs recommend them.

A survey of registered apprenticeship sponsors in the United States found that 87 percent of sponsors would strongly recommend registered apprenticeships, and another 11 percent would recommend apprenticeships with some reservations—for a total of 98 percent of sponsors recommending them.⁴⁴

Employers build a pipeline of skilled workers. Businesses can train workers for jobs that they know need to be filled due to a lack of candidates with the requisite training, as the workforce ages, and as they foresee opportunities for expansion. In a 2007 survey of sponsors of apprenticeship programs, more than 80 percent of sponsors said that a very important benefit of apprenticeships was that they helped them meet the demand for skilled workers. And 72 percent of sponsors said that apprenticeships reliably showed which workers have the skills needed.⁴⁵ In addition, employers found that apprenticeships helped document necessary job skills, raised productivity and worker morale, and reduced safety problems.⁴⁶

Employers save money on wages. Participants in an apprenticeship program initially receive wages that average 50 percent to 60 percent of their ultimate wages upon program completion.⁴⁷ So, while employers take on significant costs to sponsor apprentices, they also benefit from paying lower wages to workers during their apprenticeships. In a recent study, two-thirds of sponsors said that saving money on employee wages was very or somewhat important, as it allowed them to recoup some of the costs of running an apprenticeship program.⁴⁸ Additionally, while the Davis-Bacon Act requires contractors and subcontractors on federal building and public-works contracts to pay laborers and mechanics prevailing wage rates and

fringe benefits for the area, registered apprentices may be paid at reduced rates.⁴⁹ Some states have similar requirements for state contracts, and lower wages may be paid for apprentices in some of these states as well.⁵⁰

Employers realize lower workers' compensation costs. Because of the required emphasis on safety training, the Department of Labor reports that employers offering apprenticeships can see lower workers' compensation costs.⁵¹

Businesses in countries with more expansive apprenticeship programs show very high levels of satisfaction. A recent survey by the U.K. Department of Business found that apprentices scored 4 percent higher on an employability scale than university graduates.⁵² In the United Kingdom, employers in engineering and construction fields typically recover costs within three to four years of completion. U.K. sponsors also report improved labor supply, better efficiency in hiring and retaining employees, embedding organizational culture and values into a company's workforce, and overall productivity gains.⁵³

A Swiss study found that employers spend around \$3.4 billion annually training apprentices, but earn \$3.7 billion each year from apprentices' work during training. They also save on recruiting and employee relocation costs.⁵⁴ Consequently, 80 percent of more than 2,300 Swiss firms surveyed said that they were "satisfied" or "very satisfied" with the cost-benefit ratio of the Swiss apprenticeship program.⁵⁵

In Canada, an extensive 2009 study that surveyed almost 1,000 businesses across Canada found that employers receive a benefit of \$1.47 for every dollar spent on apprenticeship training.⁵⁶ What's more, they see benefits and revenues increase each year over the course of an apprenticeship. And research has shown that returns on investment exist in every geographic region of Canada and across companies of all sizes.⁵⁷

In short, companies do not sponsor apprentices out of social obligation; they do it because it's good for business. Heinrich von Pierer, the former president and CEO of Siemens AG in Germany, put it this way:

Siemens does not believe in apprenticeship merely for its educational value. We believe in it because it makes a bottom-line difference. We have practiced apprenticeship for over 100 years and, in our collective judgment, it gives our company a worldwide competitive edge. Today we have apprenticeship programs in sixteen countries. Among those are three different models established in the U.S. for testing.

The American workforce will clearly benefit from a major investment in apprenticeship. The “raw material” in America has proved second to none when properly trained and prepared. This is why we are aggressive investors in America and in the American workforce.⁵⁸

Apprenticeships are an excellent public investment

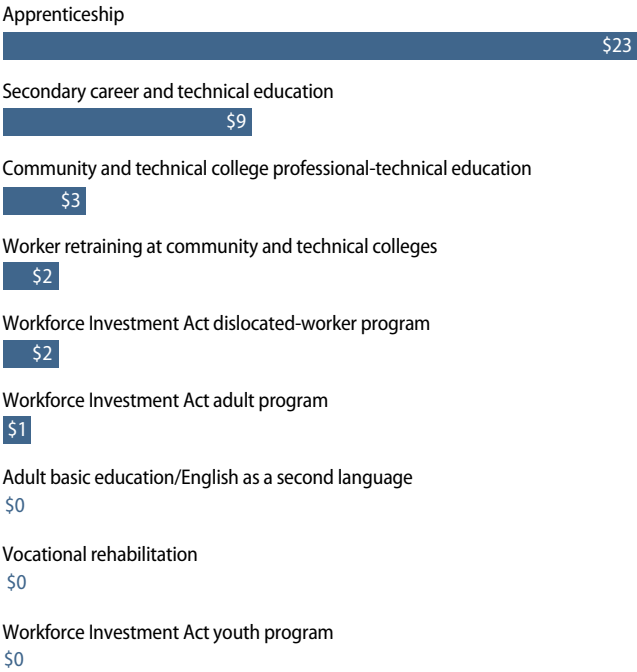
Apprenticeships are among the most effective and cost-efficient workforce development tools available to the public, in large part because their costs are borne almost entirely by employers and trade unions. As noted earlier, the building trades unions and their partner contractors invest more than \$1 billion annually in training and \$10 billion in apprentice wages and benefits.⁵⁹ Not unsurprisingly, then, extensive research has shown that they come at relatively low public cost, yield tremendous benefits to workers, and reduce spending on other government programs.

Estimates show that the social benefits of apprenticeships are overwhelmingly larger than social costs. In a comprehensive study on the effectiveness of apprenticeships in 10 diverse states, researchers found that the net social benefits were \$59,000 on average in the medium term and \$124,000 over a worker's career. This took into account apprentices' added productivity and reduced use of government programs, administration costs, and the costs of community colleges used for technical instruction. Even after subtracting the costs borne by employers and using the most conservative estimates, the net social benefits amount to a substantial \$49,000 over the career of an apprentice.⁶⁰

“The return on investment for apprenticeships was found to be substantially higher than for any other workforce training program—including community colleges.”

In the state of Washington, which conducts a narrower but more in-depth review of the outcomes and net impact of its workforce-training programs, the return on investment for apprenticeships was found to be substantially higher than for any other workforce training program—including community colleges. Specifically, the present value of an apprentice’s post-program increases in earnings and benefits, reduced by any increased taxes as well as forgone earnings and program costs during the training period, was more than \$57,000 for the first two and a half years after exiting the program and more than \$324,000 over his or her career. The estimated lifetime net benefit to taxpayers, after accounting for public costs, is more than \$85,000 per participant, for a return of \$23 for every public dollar invested.⁶¹ This compared to \$6,668 in short-term net gains and \$140,631 in long-term net gains for workers entering community college occupational programs. For those programs, the estimated lifetime net benefit to taxpayers is about \$19,000 per participant, for a return of \$3 for every public dollar invested.⁶²

FIGURE 1
Taxpayer return on investment by workforce training program, per dollar spent



Source: 2012 Washington workforce training results by program.

Moreover, apprenticeships had among the best net employment impact among Washington’s workforce training programs, with the employment rate of all participants 9.8 percentage points higher than a control group of nonparticipants. This impact is almost indistinguishable from that of attending a community and technical college (10.1 percentage points) and trails only that of vocational rehabilitation (which services individuals with disabilities) and the Workforce Investment Act’s adult program (which raises wages far less than apprenticeships and returns to taxpayers only \$1.20 for every dollar spent).⁶³ A more detailed comparative effectiveness of Washington’s workforce training programs is in Table 1.

This is not to say that other workforce training programs are ineffective, nor is it to say that apprenticeships are appropriate for all workers or employers. But to the extent that apprenticeships are underutilized due to lack of awareness, misconceptions, or similar barriers, their return on investment should be a compelling reason for us to take a look at whether we can easily expand their use and our investment in them.

TABLE 1

The comparative effectiveness of the state of Washington's workforce training programs

Program	Employment	Earnings	Skills (% participants who received credential)	Participant satisfaction	Employer satisfac- tion	Net employ- ment impact	Net earnings impact	Participant return on public investment	Taxpayer return on investment
Apprenticeship	All: 69% Completers: 83%	All: \$47,115 Completers: \$63,141	52%	Classroom: 90% On-the-job: 88%	93%	9.8 percentage points	\$18,819	\$91 to \$1	\$23 to \$1
Adult basic education/Eng- lish as a second language	48%	\$16,808	N/A	93%	95%	No significant positive impact	\$885	No significant posi- tive impact	No significant posi- tive impact
Community and technical college Professional techni- cal education	All: 65% Completers: 70%	All: \$26,138 Completers: \$28,877	57%	91%	96%	10.1 percentage points	\$9,253	\$13 to \$1	\$3 to \$1
Worker retraining at community and technical colleges	All: 66% Completers: 70%	All: \$30,331 Completers: \$31,351	57%	86%	Sample size too small	7.5 percentage points	\$2,936	\$9 to \$1	\$2 to \$1
Division of Vocational Rehabilitation	47%	\$14,520	52%	75%	Sample size too small	12.4 percentage points	\$1,428	\$3 to \$1	No significant posi- tive impact
Department of Services for the Blind	42%	\$22,802	65%	81%	Sample size too small	N/A	N/A	N/A	N/A
Private career schools	All: 62% Completers 65%	All: \$20,812 Completers: \$21,896	78%	85%	95%	3.4 percentage points	\$2,200	Major public investment is stu- dent financial aid, which is outside of scope	Major public investment is stu- dent financial aid, which is outside of scope
Secondary career and tech- nical education	Completers: 78%	Completers: \$10,980	Not listed	99%	95%	8.4 percentage points	\$2,107	\$87 to \$1	\$9 to \$1
Workforce Investment Act (adult program)	67%	\$22,262	40%	90%	93%	10.8 percentage points	\$4,458	\$8 to \$1	\$1.20 to \$1
Workforce Investment Act (dislocated worker program)	65%	\$33,893	52%	88%	93%	4.7 percentage points	\$3,540	\$7 to \$1	\$2 to \$1
Workforce Investment Act (youth program)	62%	\$12,150	55%	96%	93%	4.3 percentage points	\$2,008	\$6 to \$1	No significant posi- tive impact
WorkFirst (Washington's welfare-to-work program)	40%	\$12,426	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: 2013 Washington workforce training results by program.⁵⁴

There's room for growth

Successful use of apprenticeships in other countries compared to the relatively limited funding and reach of apprenticeships in the United States suggest that there is room to expand our program.

Other industrialized countries today use apprentices far more broadly to develop a skilled workforce. The United States has only 358,000 registered apprentices and 250,000 employers that sponsor registered apprentices, although many of them join together, leaving only 21,000 unique programs nationwide.⁶⁵ By comparison, Germany has 1.8 million apprentices and about 500,000 sponsoring companies—despite having a population less than one-third of that of the United States. If America reached Germany's per capita level of apprenticeship training, our system would support almost 7 million apprentices.⁶⁶

Switzerland is another good example, where 77 percent of students begin a training program, usually a paid, certified apprenticeship. And Swiss apprenticeships are not just for traditional apprenticeship occupations; of 190,000 apprentices in Switzerland, 35,000 are in white-collar business jobs.⁶⁷

While Germany, Switzerland, and other European countries make strong use of apprenticeships, the best comparison is with the United Kingdom, which is much closer in character to the U.S. labor market and which only saw an explosion in the number of apprenticeships in the last decade. Scotland has expanded its use of apprenticeships, doubling its Modern Apprenticeship program over the past few years to approximately 1 percent of its overall labor force. If the United States were to reach a similar level of per capita apprentices, there would be more than 1.5 million apprentices in the country—more than three times the number we have today.⁶⁸ And in England, there were 520,600 new entrants into apprenticeships in the 2011-12 academic year.⁶⁹ Adjusting for their much smaller labor market, that would be comparable to 2.5 million new entrants in the United States—compared to the 104,332 that we actually saw in 2012.⁷⁰

Federal financial support for apprenticeships makes up just a tiny fraction of total spending on training programs. In 2012, the Office of Apprenticeship at the Department of Labor spent just \$28 million and supported 155 full-time employees nationwide. In comparison, the Department of Labor spent \$3.2 billion that year for all training and employment services, not including an additional \$2 billion spent over the past few years to improve the community college system.⁷¹

Apprenticeships in the United States attract predominantly older workers, even though younger workers might be able to substantially gain from them. Today, only about 20 percent of apprentices in the United States are under age 25 and the average age is closer to 30.⁷² At the same time, there are currently close to 4 million youth under the age of 25 with a high school diploma who cannot find full-time work, many of whom could benefit from an apprenticeship.⁷³ Expanding apprenticeships to provide more career opportunities for today's unemployed young workers could help reverse some of the economic damage wrought by high youth unemployment. Youth unemployment poses a long-term threat to America's economy, as it has been shown to reduce workers' wages, decrease revenues, and increase the cost to government of health care, crime, and social assistance.⁷⁴

Significant barriers must be overcome to expand apprenticeships

There are a number of hurdles to establishing a more robust apprenticeship program in the United States. The biggest challenge is a lack of awareness and misperceptions of apprenticeships among workers and businesses alike who may not consider them when considering training or career options. Few employers or workers are aware of their tremendous benefits and return on investment. Some companies may mistakenly believe that apprenticeships only exist for unionized workers. Despite efforts by the Department of Labor to expand the reach of apprenticeships, they are still largely limited to traditional, male-dominated occupations such as construction. Moreover, there is no targeted federal funding to help businesses offset the costs of sponsoring an apprentice, nor is there a national marketing effort to make businesses aware of the benefits of hiring apprentices. Finally, a disjointed system of administration prevents us from collecting important data and establishing consistent certification standards across the country. And, while the United States once relied heavily on unions to overcome many of these challenges, declining union membership means businesses seeking to establish apprenticeship programs have less assistance. Fortunately, smart policies can address these challenges.

In this section, we will discuss in detail each of the following barriers to wider adoption of apprenticeships in the United States:

- Poor understanding of apprenticeships
- Limited occupational and gender reach
- Costs to businesses
- Disjointed administration
- Lack of research
- Inconsistent certification standards
- Lack of coordination with the education system
- Reduced unionization in the United States

Later, we will outline potential interventions to address these challenges.

Poor understanding of apprenticeships

Due to the low profile of apprenticeships in the United States, businesses and workers are largely not familiar with them. Only about 0.2 percent of American workers are in an apprenticeship program,⁷⁵ which means that few American workers have firsthand experience with how apprenticeships work. Also, because not all apprenticeship programs are run through or comply with the requirements of the official registered apprenticeship system, businesses may not understand what a registered apprenticeship entails or how it can benefit its sponsors. Furthermore, there is a widespread lack of awareness of the sources of federal funding that can be used to defray the costs of an apprenticeship.

Many American workers and businesses have incorrect or anachronistic views that prevent them from considering apprenticeships. First, many businesses mistakenly believe that apprenticeships are limited only to unionized workforces and/or require involvement from organized labor. There is a historic antecedent to this misconception: From the passage of the National Apprenticeship Act in 1937 until 1969, participants in a registered apprenticeship program did in fact need to be members of a union. In 1969, however, the Department of Labor changed these regulations to allow anyone to participate, regardless of their union affiliation. Yet a 2002 report by the South Carolina Chamber of Commerce noted that some companies have developed nonregistered apprenticeships “deliberately as a result of the confusion regarding union involvement in Registered Apprenticeships.”⁷⁶ Apprenticeships can offer great benefits to employers with nonunionized workforces just as they can continue to play an important role in traditionally unionized fields.

Second, many businesses and workers alike share the perception that apprenticeships are only appropriate for the construction trades and other manual labor occupations. To be sure, they are not wrong that the majority of active apprentices are in those fields, but the model of an apprenticeship is applicable to a wide range of occupations and there certainly are many companies that offer apprenticeships in traditionally white-collar fields.

Third, many young workers presuppose that because apprenticeship programs rarely require the completion of a college degree, they do not lead to a well-paying, middle-class career. Efforts by lawmakers and educators to expand access to four-year colleges and bachelor’s degrees have succeeded in increasing the share of college graduates in America over the past several decades, but they have also

led too many students to mistakenly believe that a four-year degree is the *only* path to achieve economic mobility. Few high school students and graduates are aware that, as an apprentice, they can achieve a long-term career and a substantial wage premium without a four-year degree. While four-year colleges will remain a good choice for many high school graduates, expanding awareness of apprenticeships can open the door to a career pathway that may be the best option for many students. In particular, apprenticeships should be an appealing avenue into the workforce for the one in three high school graduates today who does not immediately go on to seek a four-year degree.⁷⁷ Moreover, becoming an apprentice does not preclude further postsecondary education; apprenticeship programs combine on-the-job training with classroom-based education than can contribute to an associate's or bachelor's degree down the line.

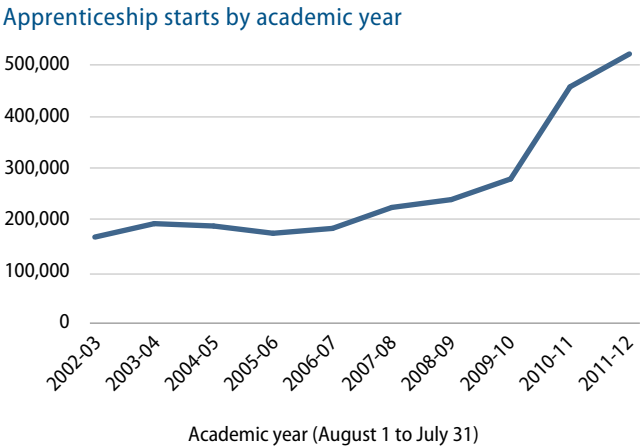
There has been a significant social mistrust of technical education stemming from the mistaken notions that vocational education is for lower-performing students and that apprenticeships require youth to focus on a career track too early. This is rooted in federal policy that historically has structurally separated—and segregated—“academic” and “vocational” education, dating all the way back to the Smith-Hughes Act in 1917 that promoted vocational education.⁷⁸ Yet vocational training today is very different than it was several decades ago, as New York City's Mayoral Task Force on Career and Technical Education Innovation reported:

The weight of this traditional separation is reinforced in the lingering negative perception of [career and technical education]; many still refer disparagingly to vocational education as it existed decades ago. From the start, vocational education students typically have been characterized as not being on a cognitive par with their academic peers. They are “hand minded,” for example, versus “abstract minded,” which include students who study an academic curriculum and are bound for college. This distinction reflects both cultural biases that still permeate policy discussions today and a history of student tracking that limited the potential of too many young people, especially students of color and those from low-income families. ... The perception of [career and technical education] as a lesser “track” from traditional college-preparatory pathways is a major challenge to informing students and families of the potential value of new, innovative [career and technical education] pathways. The impact of this stigma has limited the opportunity to capitalize on the relevancy and rigor of current [career and technical education] programs for an even broader population of students.⁷⁹

In his book *Beyond College For All*, scholar James Rosenbaum further argues, “High schools caught up in the college-for-all myth, provide little job advice or preparation, leading students to make unrealistic plans and hampering both students who do not go to college and those who start college but do not finish.”⁸⁰ Apprenticeships provide another option: a focused vocational postsecondary education that incorporates on-the-job skills training and related classroom-based education. In doing so, they provide a path to skills development and higher wages for those students who do not go to college or who do not finish college.

A public awareness campaign and significantly upgraded marketing efforts can make a big dent in these misconceptions. England, where many of the same barriers had previously existed, saw a dramatic uptick in apprenticeships after such a concerted marketing campaign in recent years.

FIGURE 2
Expanding apprenticeships in England



Source: BIS Data Service⁸¹

Apprenticeships in England

With broad-based political support, England has taken steps to expand apprenticeships over the past two decades. The number of new apprentices grew from just about 50,000 in the early 1990s, to 279,000 in 2009-10, to 520,600 in 2011-12—from about 1 in every 1,000 citizens to 1 in every 100.⁸² Prospective British apprentices can today choose from 250 industries and more than 1,400 jobs.⁸³

British political leaders embraced apprenticeships as an important tool for boosting worker skills only after a period of steep decline in apprenticeships through the 1970s and 1980s. In 1993, the Conservative government launched Modern Apprenticeships, a program that aimed to boost worker skills through the creation of 150,000 new apprentices each year.⁸⁴ The Labour government later expanded the range of qualifications that could be classified as apprenticeships, leading the way for increases in the number of apprentices in nontraditional sectors such as health care, business, and retail.⁸⁵ Recently, Prime Minister David Cameron proposed that apprenticeships will be the “new norm” in a major speech at the start of National Apprenticeship Week in March 2013.⁸⁶ He added that “there’s no better way to back people’s aspirations than to invest in apprenticeships, to invest in the skills that can make a difference to your careers.”⁸⁷

When it comes to apprenticeships, government leaders have put their money where their mouth is. Even during this time of fiscal austerity, government funding for apprenticeships has grown from £800 million in 2006-07 to £1.2 billion in 2010-11, with plans to reach £1.5 billion in 2012-13.⁸⁸ In 2012, the government launched a country-wide marketing campaign to promote apprenticeships to employers, young people, and parents. Today, subway posters, taxi sides, and newspapers across the country advertise that “82% of employers

take on Apprenticeships to build skills in their business” and “four of five employers say Apprenticeships will play a bigger part in their recruitment policy in the future.”⁸⁹ The National Apprenticeship Service recently awarded a team of young developers from Nottingham £10,000 to create a Facebook “App-renticeships” app that will offer resume advice, case study videos, and a search tool to help users find an apprenticeship, complementing the National Apprenticeship Service’s already extensive online and social media presence.⁹⁰

To be sure, the effort to expand apprenticeships in England faces its share of challenges. While 91 percent of employers are aware of government-funded apprenticeships, employer participation remains relatively low at only 9 percent.⁹¹ Compared with other European countries that support apprenticeships, the quality in terms of skills attainment of British apprenticeships is low.⁹² Additionally, women, people of color, and workers with learning disabilities participate at disproportionately low levels.⁹³ And, while apprenticeships were sold largely as a fix for high levels of youth unemployment, much of the growth in apprenticeships has been among workers age 25 and older.⁹⁴

Nevertheless, the expansion of apprenticeships in England has been shown to offer many benefits to workers, employers, and the economy. Workers who complete apprenticeships in England earn as much as £150,000 more over their careers than noncompleters—a wage premium comparable to that of an average university graduate.⁹⁵ And, according to an analysis by the Centre for Economics and Business Research, the 3.8 million projected apprenticeship completers over the next decade will contribute £2.4 billion, or 0.2 percent of gross domestic product, to the U.K. economy in the form of productivity gains.⁹⁶

Limited occupational and gender reach

While apprenticeships have been slowly expanding into nontraditional occupations here in the United States—there are currently more than 1,000 apprenticeable occupations⁹⁷—the bulk are still in traditional, male-dominated fields. In the last decade, the Department of Labor’s Office of Apprenticeship has made a concerted effort to register programs in new, high-growth areas, such as advanced manufacturing, health care, geospatial technology, information technology, and biotechnology. This has led to a new breed of U.S. apprenticeships. The Centers for Disease Control and Prevention recently began sponsoring registered apprenticeships in public health informatics,⁹⁸ and for the first time, medical doctors and Ph.D.’s will participate in a formal registered apprenticeship. Of course, nearly all medical doctors participate in an apprenticeship of sorts (though it is not registered as such)—during their internships and residencies where doctors receive on-the-job and classroom-based training while receiving a salary. The same principle can be applied to many occupations.

The efforts by the Department of Labor to expand apprenticeship occupations have been paying off: By 2007, 46 percent of all new registered apprenticeship programs were in high-growth industries. Yet there is still work to be done. These newly registered programs in high-growth industries composed only 30 percent of all active apprentices.⁹⁹

And in 2012, only 6 percent of active apprentices in the United States were women, up slightly from 5 percent in 2008.¹⁰⁰ This is not surprising, given that women make up no more than 6 percent of any one of the top 10 apprenticed occupations in 2012, which were all in the traditional skilled trades. (see Table 2)

TABLE 2
Top 10 apprenticed occupations in fiscal year 2012

Occupation title	Active apprentices	Percent of total employed in occupation who are women
Electrician	36,742	1.8
Carpenter	15,479	1.6
Plumber	13,201	1.3*
Pipefitter	8,586	1.3*
Construction craft laborer	7,947	2.9
Sheet metal worker	7,714	4.6
Roofer	5,479	1.5
Structural steel/ironworker	5,041	2.8
Painter	3,560	5.5
Pipefitter (sprinkler fitter)	3,266	1.3*

*The Current Population Survey reports pipelayers, plumbers, pipefitters, and steamfitters in a single category, in which women make up 1.3 percent of the total employed.

Source: Employment and Training Administration, "Data and Statistics: Registered Apprenticeship National Results"; Bureau of Labor Statistics, Current Population Survey, Table 11, "Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity."

In comparison, England has overhauled its apprenticeship program to the point at which a majority of new apprentices now choose programs in the service sectors, such as business administration and retail. As a result, in 2012, women made up the majority of new apprentices in England.¹⁰¹

In order to increase the number of U.S. apprentices, it will be necessary to introduce apprenticeships to occupations that have not traditionally used apprentices. In doing so, we can also increase the share of women who become apprentices.

Cost to businesses

Businesses that sponsor apprentices must be willing to take on significant costs, including time from skilled employees to train apprentices, equipment for training, additional workers' compensation insurance, apprentices' wages, and, in many cases, tuition for related classroom-based training. In addition, the administrative processes and paperwork may deter companies from sponsoring registered apprentices. Moreover, companies may be reluctant to establish new apprenticeships in nontraditional occupations if they have insufficient support from state apprenticeship offices.

Unlike in many other countries, where the public finances at least a portion of the school-based component, pays a portion of apprentices' wages, or provides tax credits to subsidize sponsor program costs, there is no such federal incentive in the United States. Workforce Investment Act programs may be able to cover some of these costs, but these limited federal resources are allocated by local Workforce Investment Boards and are not guaranteed. Some states have established tax incentives for businesses offering apprenticeships; South Carolina, for example, provides a \$1,000 tax credit per apprentice.

Given these not-insignificant costs, businesses may fear that, after spending a great deal of resources training an apprentice, the worker may be lured by a competitor offering higher wages. But according to a report by the South Carolina Chamber of Commerce, "many companies with Registered Apprenticeships report that such training programs cement a solid relationship with their workers that results in greater company loyalty and job satisfaction." Furthermore, the Department of Labor's survey of employers noted that poaching was not seen to be a problem at all by 46 percent of employers who actually sponsor programs, and those who did view it as a problem still recommended apprenticeships by an overwhelming 85 percent.¹⁰²

As we learned in South Carolina, even a modest public investment aimed at offsetting some of the costs to apprenticeship sponsors can go a long way toward incentivizing companies to hire apprenticeships. A number of other states also offer tax credits or other subsidies for apprenticeships. (see Table 3)

TABLE 3
Government subsidies for apprenticeships by state

State	Benefits
Arkansas	Tax credit to employers (youth apprenticeships): lower of \$2,000 and 10 percent of youth apprentice wages ¹⁰³
California	Subsidies to education agencies: to partner with apprenticeship training committees to train apprentices Subsidies to apprenticeship training committees: to cover classroom-related and supplemental instruction costs ¹⁰⁴
Connecticut	Tax credit to employers (manufacturing, plastics, and plastics-related trades): lower of \$4,800, \$4 per hour multiplied by the total number of hours worked by the apprentice during the first half of a two-year apprenticeship or the first three-quarters of a four-year apprenticeship, and 50 percent of the total wages paid to the apprentice during the first half of a two-year apprenticeship or the first three-quarters of a four-year apprenticeship Tax credit to employers (construction trades): lower of \$4,000, \$2 per hour multiplied by the total number of hours worked by the apprentice during a four-year apprenticeship, and 50 percent of the total wages paid to the apprentice during a four-year apprenticeship ¹⁰⁵
Florida	Subsidies to employers: to cover training costs (provided through school districts and community colleges) ¹⁰⁶
Iowa	Subsidies to employers: to cover classroom and on-the-job training costs for apprentices in high-technology jobs or jobs utilizing the most up-to-date technologies (provided through community colleges) ¹⁰⁷
Kansas	Subsidies to apprentices (child care and early education industry): to cover books, fees, and tuition for required technical instruction ¹⁰⁸
Louisiana	Tax credit to employers: lower of \$1,000 and \$1 per hour multiplied by the total number of hours worked by the apprentice*
Maine	Subsidies to apprentices: to cover up to 50 percent of related tuition costs ¹⁰⁹
Missouri	Tax credit to employers (youth apprenticeships): 50 percent of youth apprentice wages and 30 percent of property and equipment costs ¹¹¹
New Jersey	Subsidies to employers: to hire graduates of the Youth Transitions to Work program (\$5,000 grant) ¹¹² Subsidies to country coordinators: to bolster local apprenticeship programs ¹¹³
Rhode Island	Tax credit to employers (machine tool/metal trade and plastic process technicians): lower of \$4,800 and 50 percent of apprentice wages ¹¹⁴
South Carolina	Tax credit to employers: \$1,000 per apprentice ¹¹⁵
Texas	Subsidies to employers: to cover related classroom instruction costs (provided through public educational institutions) ¹¹⁶
Virginia	Tax credit to employers: 30 percent of classroom training costs (with a limit of \$100 per apprentice if the coursework is incurred at a private school) ¹¹⁷
Washington	Subsidies to apprentices: 50 percent of tuition costs at public community and technical colleges ¹¹⁸
West Virginia	Tax credit to employers: lower of \$2,000, 50 percent of apprentice wages, and \$2 per hour multiplied by the total number of hours worked by the apprentice ¹¹⁹

* Louisiana Workforce Commission, "Registered Apprenticeship Tax Credit Quick Reference Guide," available at <http://www.laworks.net/Downloads/App/RegisteredApprenticeshipTaxCreditGuide.pdf> (last accessed November 2013).

Finally, as we will discuss in greater detail later, while the costs of apprenticeships may be well anti-

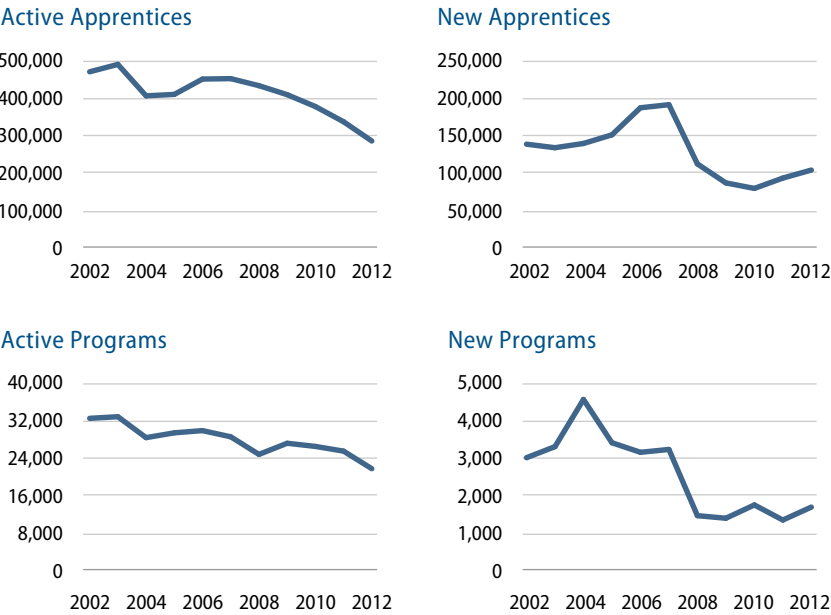
pated by employers, there is very limited research into their economic benefits. This skews cost-benefit calculations by businesses, making public investments in apprenticeships all the more valuable to prospective sponsors.

Lack of marketing

Although a handful of states engage in some marketing activities, marketing of apprenticeships in America is practically nonexistent. While the number of apprentices and apprenticeship programs in the United States has declined over the past decade, a strong marketing campaign could reverse that trend. Using England as an example, a sustained and intense marketing campaign there, combined with complementary policy changes, more than doubled apprenticeships during the same time period that the United States saw declines. (see Figures 2 and 3)

State officials lack sufficient, easily accessible funding opportunities to meet the need for increased marketing, outreach, and training efforts. An official in Utah, for example, noted that there simply is not enough money for them to do marketing; instead they must rely mostly on word of mouth. Many apprenticeship offices do the bulk of their outreach through websites, forms, and other online communications, which can be far less effective than in-person meetings and active and sustained targeted outreach. Many states do not even have up-to-date websites or accessible web databases, limiting their ability to market to businesses or prospective apprentices.

FIGURE 3
Apprenticeships have been declining in the United States*



* These figures do not include nearly 74,000 apprenticeships in the Military Apprenticeship Program, a formal military training program.
Source: U.S. Department of Labor Office of Apprenticeships

Disjointed administration

Any effort to expand apprenticeships in the United States must address the confusing and disjointed federal and state system of administration.

Registered apprenticeships are administered by the Office of Apprenticeships within the Department of Labor, which consists of a central national office, regional offices, and representatives assigned to each state. The Office of Apprenticeship operates directly in 25 states and delegates some of its operational authority to state apprenticeship agencies in another 25 states and the District of Columbia. The Office of Apprenticeship approves new apprenticeable occupations and their standards, registers programs and apprentices, protects worker safety and health, issues certificates of completion, and ensures that programs offer high-quality training and produce skilled workers. The office also works to promote apprenticeships and to expand their reach into high-growth sectors. State apprenticeship agencies spend most of their resources on approving the standards for new apprenticeable occupations and registering new programs and apprentices.

The Office of Apprenticeship has been quite successful at carrying out its core responsibilities, such as registering programs and apprentices, ensuring high standards for apprenticeable occupations, and protecting apprentice safety and health. The bifurcated federal-state system of administration, however, hampers data collection and prevents the establishment of a uniform national certification system—both of which are critical to the effective use of apprenticeships in the United States.

Lack of research

While researchers have devised estimates of the economic benefits of apprenticeships to workers and the public, we still lack estimates of the return on investment to the American businesses that sponsor them. Employer surveys indicate that businesses benefit from hiring apprentices, but hard data would help market apprentices to new companies. For instance, research showing that Canadian businesses gain \$1.47 for every \$1 they invest in training apprentices has been a boon to marketing efforts in that country.¹²¹ Yet in the United States, we don't even know the average cost borne by an employer for an apprenticeship. Better research can help establish the credibility of the training model in this country. Furthermore, more advanced ongoing research focused on the relative returns to

investment in specific occupations could help target marketing efforts by identifying the most apprenticeable occupations generally. Occupational research could also help focus efforts to increase women's participation in apprenticeships.

But this research is hampered by the lack of a fully centralized, coherent, and discernible system of administration and accreditation. This in turn makes program monitoring and assessment almost impossible. Because of the split between the Office of Apprenticeship and state apprenticeship agencies, no single entity is administering, registering, and monitoring all ongoing apprenticeships in the United States. State apprenticeship agencies frequently fail to collect meaningful data on their apprenticeship programs. Those that do collect data often do not report this data to the Department of Labor or the Bureau of Labor Statistics for analysis.

The Office of Apprenticeship's delegation of data collection and reporting to individual state agencies results in inadequate evaluation and monitoring of apprenticeship programs. Specifically, the federal government does not enforce state office data entry into the Registered Apprenticeship Partners Information Data System, or RAPIDS, the online system for data collection on apprenticeships. Currently, RAPIDS is used by 25 Office of Apprenticeship-administered states and 8 of the 25 state apprenticeship agencies for a total of just 33 out of 50 states.¹²²

Moreover, RAPIDS data is not available for the public to view for research purposes. Public information about the scope and completion rates of individual apprenticeship programs in states would be useful to both prospective apprentices and researchers. Even nationally, the Office of Apprenticeship publishes only the most rudimentary data on its public website—state data for fiscal years 2011 and 2012 only and national data going back only to fiscal year 2002. In each case, information is limited to the number of active apprentices, active programs, new apprentices, new programs, and completers. The website does not include education attainment statistics, wages, gender breakdown, occupational breakdown beyond the top 10, or historical state-level data.¹²³

Not only is this crucial information not web accessible, but we found that it is impossible to find altogether. We attempted to contact every state apprenticeship office to collect data on state program administration, and we pulled as much information as possible off of their public websites. We requested a defined set of information, including each office's budget, the number of full-time employee equivalents, the current number of program sponsors in the state, the number of public offices around the state, and the services provided to businesses (for

example, assistance with Department of Labor paperwork, work-skill assessments, curriculum development, and more). In some cases, offices were incredibly helpful, but in many cases, offices did not have the information available, were not reachable, simply refused to answer, or were using proprietary (and hence incompatible) definitions for data.

While the federal Office of Apprenticeship was helpfully able to provide some unpublished data, it reported that it did not collect or compile all of the data we requested. Clearly, there is room to improve access to information on the use of apprenticeships in the United States. Existing data, however, tell us that apprenticeships offer great benefits to workers and an excellent return on investment to the public. And, although research suggests that hiring apprentices benefits businesses as well, better data collection would help us improve the design of our apprenticeship programs and make a compelling case to businesses to hire apprentices.

Standards

Employers are hungrier than ever for uniform competency-based credentials certifying that a worker has demonstrated his or her ability to perform a specific set of skills. Employers are also pushing for stackable, tiered credentials that allow workers to progress up the skills and career ladder one rung at a time and to exit and re-enter the training system over the course of their lives—instead of front-loading all of the training. For example, the Manufacturing Institute, the nonpartisan affiliate of the National Association of Manufacturers, has introduced the Manufacturing Skills Certification System to provide workers access to a system of nationally portable, industry-recognized credentials.

To be sure, the registered apprenticeship system had made some progress toward developing a more uniform and stackable credential system. While apprenticeships have slowly been moving toward competency-based or hybrid qualification models, that trend must be accelerated for employers to depend more heavily on them. And in 2008, the Department of Labor began to allow sponsors to ask for “interim credentials” to be issued prior to completion of the apprenticeship.¹²⁴ While this is a step toward a stackable credential model, it is not as well-defined as the Manufacturing Skills Certification System, which includes certifications for basic skills all the way through occupation-specific skills. These certifications include:

- The National Career Readiness Certificate, which verifies baseline academic skills and general readiness for the workforce
- The Manufacturing Skills Standard Council Certified Production Technician Certification, which “covers areas such as safety, production processes, maintenance awareness, and quality assurance”¹²⁵
- Thirteen specialized technical knowledge and skills certifications for specific occupations¹²⁶

The U.S. registered apprenticeship system is also not nearly as extendible as England’s three-tiered system of intermediate-level, advanced-level, and higher-level apprenticeships.¹²⁷

Furthermore, registered apprenticeships vary across the country. Unlike the Manufacturing Skills Certification System—which establishes a single certification standard across the country—the national registered apprenticeship system includes 25 states that each independently review and approve apprenticeable occupations. As a result, standards are not perfectly uniform across all state lines, and scarce state government funds are spent reviewing standards instead of engaging in critical marketing efforts. This disjointed registration system has been shown not to significantly affect worker outcomes, but it adds unneeded complexity and makes it harder to make a national shift toward competency-based standards.

The registered apprenticeship system took another smart step toward uniformity when the Department of Labor determined that, other than the Office of Apprenticeship, only official state apprenticeship agencies have the authority to register occupations and apprenticeships.¹²⁸ Prior to 2008, state apprenticeship councils of business, labor, and other public interests—but not all composed of public officials—had the authority to register occupations, which resulted in more limited uniformity and accountability to federal Department of Labor oversight. Today, the power to register apprenticeable occupations lies exclusively with the federal Office of Apprenticeship and with federally recognized state apprenticeship agencies. Furthermore, the new 2008 rules required state apprenticeship agencies to reapply for federal recognition within two years and again every five years. While these changes did not fully unify registered occupations across all states, they have increased accountability and oversight over the registered apprenticeship system.

Finally, several state apprenticeship officials noted that the existence of unregistered apprenticeships—ranging in character from internships to more robust training models—can be a significant challenge for selling *registered* apprenticeships. Some employers may question the need to participate in the national apprenticeship system, while other employers may see poor outcomes from unregistered apprenticeships and decide to forgo apprenticeships entirely. And because unregistered apprenticeships are by definition not “on the books,” it can be hard for state or federal apprenticeship staff to reach out to those sponsors to get them involved in more systematic efforts, improve coordination with local community and technical colleges, or to connect them with available financial support.

Coordination with educational systems

Linkages between businesses and community and technical colleges have historically been poor. Community and technical college systems have not routinely sought out input from area businesses to help shape curricula and coordinate with apprenticeship and other outside training programs. Even where some of those links exist or have begun to be built, there are still barriers for ensuring that local community and technical colleges are offering the courses and programs needed by companies for their apprenticeship training. Some businesses have also raised concerns with the limited flexibility of community college classes, making it hard for sponsors to complement on-the-job training with related classroom-based instruction. In South Carolina, lawmakers addressed this problem head-on by locating the apprenticeship office within the technical college system.¹²⁹

Similarly, students have had difficulty transferring credits from occupational certificate and associate’s degree programs earned during an apprenticeship to bachelor’s degrees.¹³⁰ While so-called “articulation agreements” have increasingly been put into place to help transfer such credits—and to offer credits for on-the-job training as part of registered apprenticeships—they are still relatively rare. Consequently, apprenticeship completers who go on to earn a degree often face significant barriers.

In Indiana, Ivy Tech Community College has developed an initiative that should serve as an excellent example of how community and technical colleges can effectively coordinate with apprenticeship programs. Workers enrolled in a recognized apprenticeship training program can obtain an associate’s degree or technical certificate from Ivy Tech. Apprenticeship trade programs, such as carpenters, electri-

cians, iron workers, and sheet metal workers, participate in the program.¹³¹ As part of the program, Ivy Tech awards credit for the time apprentices spend on the job, and apprentices may take several Ivy Tech general education courses as the related educational component of the apprenticeship training. Apprentices who receive a two-year degree from Ivy Tech may use it as the basis to pursue a bachelor's degree or, in some fields, a master's degree.¹³²

Declining union membership

For decades, unions have played a key role in offering apprenticeship programs and establishing strong certification systems. But as unions shrink, so does their ability to help us overcome the many hurdles to setting up apprenticeship programs that we have outlined here. Unions help establish, manage, and fund apprenticeship training programs in partnership with employers, which has led the Organisation for Economic Co-operation and Development to point out that countries with strong apprenticeship systems often have a “close and active involvement of both of the social partners representing employers and the trade unions.”¹³³ Additionally, research has shown that joint programs with union participation have higher enrollments of women and people of color and significantly better performance as measured by attrition and completion rates.¹³⁴

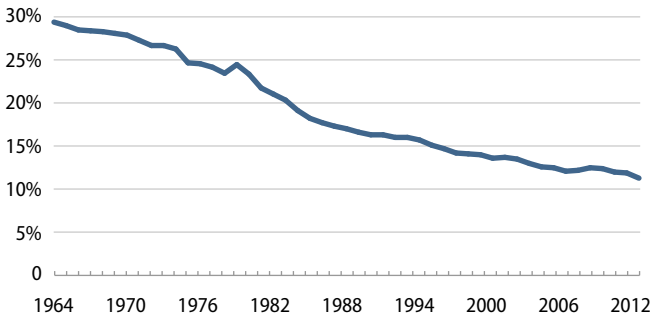
In particular, unions are well situated to identify and codify the occupational skills requirements necessary for registering an occupation as apprenticeable. Moreover, unions are responsible for developing many robust certification systems for competency-based apprenticeships. As a result, apprenticeship sponsors that operate without union support must work substantially harder to develop competency-based certification systems—even though they may prefer them to certifications based on duration of participation.¹³⁵

While joint union-management programs now only account for about one-fourth of sponsors in the United States, they continue to account for a large number of apprentices.¹³⁶ Not surprisingly, as union membership has declined over the past decades, so has the number of apprenticeships in the country. Indeed, our analysis shows an extremely strong positive correlation (0.87) between active apprenticeship programs and union membership rates going back to 2001.

The historical declines in union membership rates have likely taken a significant toll on apprenticeships here in America. Given the crucial role unions play in establishing and maintaining strong apprenticeship programs, any effort to expand apprenticeships in the United States would benefit greatly from increasing union membership and boosting apprenticeships among nonunionized workforces.

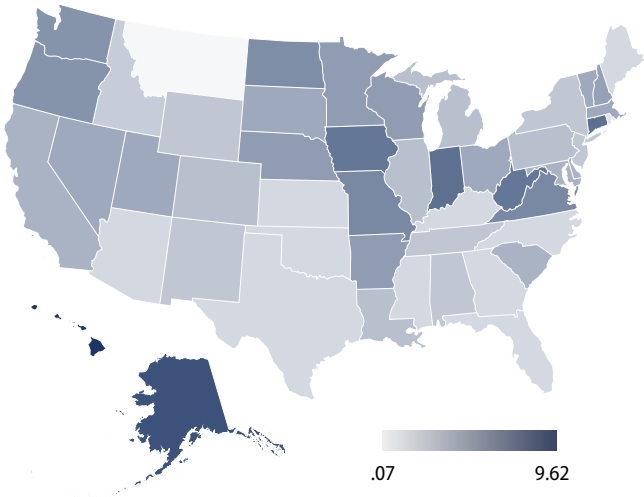
In sum, although apprenticeships offer great benefits to workers and businesses alike, a number of stumbling blocks have prevented them from gaining the widespread popularity in the United States that they enjoy in many other nations. Fortunately, we can overcome all of these obstacles with smart, low-cost policy interventions. Dramatically increasing the number of apprentices in the United States will require boosting public awareness, expanding into nontraditional occupations, mitigating the costs to sponsors, enhancing research and certification standards, and improving coordination with education systems. In the next section, we outline a set of policies to do just that.

FIGURE 4
Union membership rate



Source: Updated data from Barry T. Hirsch, David A. MacPherson, and Wayne G. Vroman, "Estimates of Union Density by State," *Monthly Labor Review* 124 (7) (2001), available at <http://union-stats.gsu.edu/MonthlyLaborReviewArticle.htm>

FIGURE 5
Active apprenticeships per thousand 18–64 year olds, by state



Source: Author's analysis of Employment and Training Administration, "Registered Apprenticeship National Results" available at http://www.doleta.gov/OA/data_statistics.cfm (last accessed November 2013) and U.S. Census Bureau, "Census Summary Table File 1 Table 3: Population by Sex and Selected Age Groups for the United States, Regions, States, and Puerto Rico: 2010," available at <http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf>.

TABLE 4
State apprenticeship programs

State	Administered by state (SAA) or federal (OA)	Active apprentices, FY 2013	Active programs, FY 2013	New apprentices, FY 2013	New programs, FY 2013	Completers, FY 2013	Location of apprenticeship office
Alabama	OA	4,435	101	1,160	9	609	U.S. Dept. of Labor
Alaska	OA	2,916	361	755	39	249	U.S. Dept. of Labor
Arizona	SAA	4,554	105	1,162	2	499	Arizona Commerce Authority
Arkansas	OA	4,917	92	1,483	3	452	U.S. Dept. of Labor
California	OA	49,794	228	13,871	6	4,343	U.S. Dept. of Labor
Colorado	OA	6,078	248	2,158	6	652	U.S. Dept. of Labor
Connecticut	SAA	10,459	***	6,247	***	1,379	Connecticut Labor Department
Delaware	SAA	1,196	322	309	28	51	Delaware Office of Labor Law Enforcement
District of Columbia	SAA	224	282	224	***	200	DC Apprenticeship Council (public-private partnership)
Florida	SAA	11,787	251	3,525	8	1,281	Florida Department of Education
Georgia	OA	6,258	202	1,202	3	547	U.S. Dept. of Labor
Guam	SAA	841	99	199	8	31	U.S. Dept. of Labor
Hawaii	SAA	8,288	81	1,386	***	532	Hawaii Department of Labor and Industrial Relations
Idaho	OA	1,221	181	390	9	140	U.S. Dept. of Labor
Illinois	OA	13,616	555	2,952	14	2,251	U.S. Dept. of Labor
Indiana	OA	18,718	839	5,907	48	2,845	U.S. Dept. of Labor
Iowa	OA	8,037	662	2,908	98	1,310	U.S. Dept. of Labor
Kansas	SAA	1,970	291	381	6	176	Kansas Department of Commerce
Kentucky	SAA	2,733	149	678	8	226	Kentucky Department of Labor
Louisiana	SAA	4,949	55	1,439	***	367	Louisiana Department of Labor
Maine	SAA	995	195	329	10	135	Maine Department of Labor
Maryland	SAA	7,904	488	573	3	82	Maryland Department of Labor, Licensing and Regulation
Massachusetts	SAA	10,084	1,606	4,558	191	1,680	U.S. Dept. of Labor
Michigan	OA	11,275	1,101	2,957	87	973	U.S. Dept. of Labor
Minnesota	SAA	9,440	294	3,432	***	288	Minnesota Dept. of Labor and Industry
Mississippi	OA	2,078	99	746	17	201	U.S. Dept. of Labor
Missouri	OA	14,324	507	5,086	13	2,253	U.S. Dept. of Labor

State	Administered by state (SAA) or federal (OA)	Active apprentices, FY 2013	Active programs, FY 2013	New apprentices, FY 2013	New programs, FY 2013	Completers, FY 2013	Location of apprenticeship office
Montana	SAA	42	3	***	***	3	Montana Dept. of Labor & Industries
Nebraska	OA	3,250	89	1,485	3	336	U.S. Dept. of Labor
Nevada	SAA	4,112	95	840	1	322	Nevada Office of Labor Commissioner
New Hampshire	OA	2,313	414	555	21	320	U.S. Dept. of Labor
New Jersey	OA	8,445	1,818	1,509	34	1,008	U.S. Dept. of Labor
New Mexico	SAA	1,967	61	450	***	178	New Mexico Dept. of Workforce Solutions
New York	SAA	19,513	747	4,115	49	2,963	New York State Dept. of Labor
North Carolina	SAA	5,737	558	2,426	87	986	North Carolina Dept. of Labor
North Dakota	OA	1,447	79	535	4	133	U.S. Dept. of Labor
Ohio	SAA	16,303	928	4,652	20	1,409	Ohio Dept. of Job and Family Services
Oklahoma	OA	2,302	124	644	4	286	U.S. Dept. of Labor
Oregon	SAA	7,596	170	2,472	1	1,218	Oregon State Bureau of Labor and Industries
Pennsylvania	SAA	14,497	873	3,595	64	1,721	Pennsylvania Dept. of Labor & Industry
Rhode Island	SAA	463	481	462	40	235	Rhode Island Dept. of Labor & Training
South Carolina	OA	6,402	618	2,030	67	966	U.S. Dept. of Labor
South Dakota	OA	1,153	88	326	7	122	U.S. Dept. of Labor
Tennessee	OA	6,086	335	1,332	8	456	U.S. Dept. of Labor
Texas	OA	15,605	428	4,811	19	1,197	U.S. Dept. of Labor
Utah	OA	3,941	352	970	15	451	U.S. Dept. of Labor
Vermont	SAA	990	343	248	86	69	U.S. Dept. of Labor
Virginia	SAA	17,953	2,655	4,324	387	3,615	Virginia Dept. of Labor & Industry
Washington	SAA	13,779	309	3,996	17	1,613	Washington Dept. of Labor and Industries
West Virginia	OA	4,913	587	1,305	18	431	U.S. Dept. of Labor
Wisconsin	SAA	11,092	1,047	3,538	113	1,295	Wisconsin Dept. of Workforce Development Bureau of Apprenticeship Standards
Wyoming	OA	485	88	194	9	58	U.S. Dept. of Labor

* Each state reports this information differently, and the number provided is the most recent data available. In some cases, this number may count joint sponsors as a single sponsor. Additionally, this column of data was collected in July to August 2013 but is constantly in flux.

** 2008 data.

*** Data not available.

Case study: South Carolina

South Carolina offers a particularly appealing model for rapidly expanding the use of apprenticeships. In 2001, the South Carolina state government issued a report highlighting key gaps between young adults' skills and workforce needs into the future. That report called for "broadening [the] view of education beyond traditional academic boundaries to begin to see education as the precursor to employment" and urged enforcement of the School-to-Work Transition Act of 1994, which calls for apprenticeships and other programs to be used to obtain occupational skills needed for success.

This report spurred the business community, acting through the South Carolina Chamber of Commerce, to issue a white paper finding that apprenticeships were underutilized and recommending a "systemic structure for encouraging the development of apprenticeship training opportunities statewide." The South Carolina Chamber of Commerce subsequently hired a consultant to analyze the state's readiness for the creation of a statewide apprenticeship program—including an analysis of constraints and opportunities for the use of apprenticeships, and recommendations on how to overcome existing barriers.

A few years later, the South Carolina Technical College System agreed to recommendations made by the South Carolina Chamber of Commerce to create a statewide program, and with \$1 million in funding from the state legislature, Apprenticeship Carolina was founded in 2007 (and fully staffed in 2008). Since then, South Carolina has enjoyed a rapid expansion of apprenticeships, despite a budget of less than \$700,000 annually, only six government employees, and a modest \$1,000 employer tax credit per apprentice per year (for up to four years) passed by the state legislature. Apprenticeship Carolina's key functions are to: (1) build relationships with employers; (2) market apprenticeships; (3) assist with the completion of apprenticeship registration paperwork for the U.S. Department of Labor; (4) identify core job competencies; and (5) coordinate curricula for job-related education with the technical college system. These services are offered to employers free of charge.

Since 2007, Apprenticeship Carolina has helped to register nearly 8,000 new apprentices—a large jump from the 777 apprentices

that existed in South Carolina at the program's inception. The state's success, especially over the past two years, has been dramatic. From fiscal year 2011 to 2012, the number of new apprentices in South Carolina rose from 1,238 to 1,703—a 38 percent increase—compared with a national increase of only 12 percent (from 93,560 new apprentices in fiscal year 2011 to 104,332 in 2012). The large increase in apprentices has been made possible because of strong support by the state's business community. Since 2007, South Carolina has seen a 570 percent increase in employer participation. In 2007, there were only 90 companies with registered apprenticeship programs in the state; today there are 603 companies, and many more are planning to become involved. Apprenticeship Carolina now averages a new company registration each week.

To be sure, South Carolina's rate of completion of apprenticeships was relatively low at 23 percent in fiscal year 2012—compared with a national average of 39 percent—but this is only a reflection of a single point in time (the state's completion rate in fiscal year 2011 was 38 percent) and also does not reflect the new programs and cohorts of apprentices who have started in the past few years. The state will need to take steps to ensure that its apprenticeship programs are high quality and effective. Nevertheless, we believe that rapidly expanding the reach of apprenticeships is an important first step that should be followed up with efforts to improve quality.

South Carolina's efforts highlight the success of a public-private partnership. Research and advocacy by the business community identifies potential barriers to expansion, helps implement strategies for overcoming them, and spurs initial adoption by its members. State government undertakes complementary (and often linked) efforts to create incentives for private sponsorship of apprenticeships, to conduct ongoing outreach and marketing, and to lower the administrative burden of participation by businesses.

Sources: South Carolina Chamber of Commerce, "Apprenticeship: An Important Avenue for Building A Skilled Workforce in South Carolina" (2002); South Carolina Chamber of Commerce, "Apprenticeships in South Carolina: Baseline Report and Recommendations" (2003); data provided by the Department of Labor's Office of Apprenticeship; Noelle Phillips, "S.C. Employers Training Their Own," *The State*, September 7, 2009, available at <http://www.apprenticeshipcarolina.com/press14.htm>; Brad Neese, phone interview with authors, June 5, 2013.

Effective policy can address the challenges to establishing apprenticeship programs

Smart policies can address the hurdles to increased and more widespread adoption of apprenticeships in the United States and expand access to a training system that has been proven to raise workers' wages and boost businesses' bottom lines. In doing so, we can begin to reverse the looming skilled-worker shortage, better connect young workers to career opportunities, and boost America's global economic competitiveness. We propose a set of policies that will expand apprenticeships by improving marketing to businesses, introducing financial incentives for employers, enhancing data collection to better understand the economic benefits of apprenticeships, and launching a national campaign to enlist commitments from businesses to engage unemployed young Americans in apprenticeships.

Create a national apprenticeship website

The Departments of Labor, Commerce, and Education should work together to create a new public-facing website—www.apprenticeships.gov—that can act as a clearinghouse and marketing tool for apprenticeships in the United States. As an example, policymakers could expand on the initial work of the private nonprofit American Institute for Innovative Apprenticeship, which offers a user-friendly website marketing apprenticeships to businesses and workers.

Create an online apprenticeship locator

The Department of Labor should create and maintain an up-to-date, easily searchable online database of all apprenticeship openings nationwide on the new website, making it easy for prospective apprentices to locate opportunities. (Program sponsors would be encouraged to submit any openings to this database as they arise and remove them when they have been filled.) England's main

online apprenticeship portal (www.apprenticeships.org.uk) is an easy-to-navigate page with one of three large, permanent links allowing prospective apprentices to search vacancies nationwide. Its Apprenticeship Vacancy Matching Service allows prospective apprentices to search by keyword, occupation type, learning provider, employer, apprenticeship type, and location to find current openings. In contrast, the Department of Labor offers a link at the bottom of its main apprenticeship page to search a “registered apprenticeship program sponsors” database, which offers only a list of sponsors of registered programs, not a searchable database of current openings.

Launch an initiative to bring unemployed high school graduates into apprenticeships

To jumpstart a new push to drastically expand apprenticeships, we propose that the White House launch an initiative called “Off the Bench” to help place 100,000 young unemployed high school graduates in apprenticeships. This new initiative, in coordination with efforts by the Departments of Labor, Education, and Commerce, could collect voluntary commitments from employers and labor-management organizations to create or expand registered apprenticeship programs and hire these individuals who stayed in school and graduated. In exchange, a coordinated task force, including representatives from the Departments of Labor, Commerce, and Education, would offer employers extensive help in navigating the registration process and coordinating with local colleges to help ensure that the appropriate coursework is made available.

This initiative could be modeled in part after the Joining Forces initiative designed to aid reemployment of returning veterans. Only one year after its creation, the program enlisted the support of 2,000 American companies and exceeded its initial goal of hiring 125,000 veterans and military spouses. This and related efforts helped to lower veteran unemployment by 20 percent in that same span of time. In fact, it was so successful that the same companies made an additional commitment to hire 250,000 veterans and military spouses going forward.¹³⁷

In August 2013, there were nearly 1.1 million unemployed Americans between the ages of 16 and 24 who had graduated high school (or earned a high school equivalency degree) but had not enrolled in any college or associate’s degree program—many of whom would be good candidates for apprenticeships.¹³⁸ Reaching the target of 100,000 new apprenticeships would drop the unemploy-

ment rate in this population by 10 percent and give employers experience setting up and expanding apprenticeship programs. This initiative would serve as an initial catalyst to spark interest in apprenticeships and raise public awareness for their benefits.

Convene a blue ribbon commission

President Barack Obama, or a nonprofit organization with appropriate resources and stature, should convene a blue ribbon commission on overhauling our national apprenticeship system and making it a more central mechanism for training workers for middle- and high-skill jobs. Such a commission should include experts from the Departments of Labor, Education, and Commerce; academic experts; state governments; businesses; unions; nonprofit and for-profit training providers; community and technical colleges; state universities; public school districts; and One-Stop Career Centers. The commission would encourage collaboration among stakeholders and also identify recommendations for expanding the reach of apprenticeships into new businesses, industries, and occupations.

Leverage the federal workforce and federal contracting to support apprenticeships

The federal government should create apprenticeships in the federal workforce

As the largest employer of Americans, the federal government can show leadership by systematically reviewing its future workforce needs and creating apprenticeships to meet them.

Government contracts should preference contractors that offer apprenticeships and mandate their use in contracts of more than \$100 million

The government issues thousands of contracts with businesses each year and can include a preference for businesses that use apprenticeships as one of the criteria in evaluating contracting bids. Businesses receiving large contracts of more than \$100 million are sure to already employ workers in apprenticeable occupations,

such as shipbuilding. In these cases, we believe the government could require some use of apprenticeships under these contracts to ensure the future availability of skilled labor in these fields.

Improve marketing to businesses

The Department of Commerce should promote apprenticeships by marketing apprenticeships to employers, assisting manufacturers in developing apprenticeship programs, and offering competitive grants to promising state-industry partnerships that aim to create new apprenticeships. Engaging the Department of Commerce is crucial to boosting employer demand for apprentices, as businesses tend to view the Department of Commerce as their advocate within the administration. Given the agency's longstanding business relationships and efforts to strengthen American business and trade competitiveness, the Department of Commerce is ideally positioned to educate employers about the value of apprentices and assist them in developing apprenticeship programs. It will be able to reach local businesses and business associations that will in turn be the most believable and well-received proselytizers of apprenticeships among their peers. The Department of Commerce should of course coordinate with the Department of Labor's Office of Apprenticeship, which will continue to focus on registration, safety oversight and enforcement, and occupational research.

Specifically, the Department of Commerce can educate and spur interest in apprenticeships in the business community through a concerted, agencywide effort.

The Department of Commerce's Office of Business Liaison should develop and push out marketing materials on apprenticeships that are specifically targeted to businesses

The Office of Business Liaison should promote the use of apprenticeships in any outreach or responses to inquiries/concerns related to workforce needs or skills gaps. It can focus on disseminating research related to those issues that businesses will be most animated by, including:

- Evidence of return on investment to businesses—not just workers or the public
- Estimates of time to recover costs of training apprentices and paying their wages
- Surveys of participating businesses overwhelmingly recommending the use of apprenticeships to other businesses
- Data showing that “poaching” of trained apprentices is not a major concern for most businesses that have had an apprenticeship program

The National Institute of Standards and Technology Manufacturing Extension Partnership should create new apprenticeship programs

The Manufacturing Extension Partnership, or MEP, a public-private partnership that helps small and medium-sized manufacturers grow and innovate, should create a dedicated program to educate manufacturers on the benefits of apprenticeships and provide technical assistance to help them establish their own apprenticeship programs. While MEP has expanded its efforts to ensure a strong manufacturing workforce, the partnership has not yet focused on promoting apprenticeships. We believe that MEP can play a critical role in expanding apprenticeships, as manufacturers are a key target for expansion and the partnership already has a strong relationship with manufacturers on the ground.

MEP has recently sought to bolster its role in supporting a strong manufacturing workforce, and a new apprenticeship program would align well with the partnership’s mission. MEP’s Next Generation Strategy identifies workforce as one of five key areas that must be addressed for growth in manufacturing, and the partnership has supported this by encouraging collaboration between local Workforce Investment Boards and MEP centers, working with the National Association of Manufacturers to raise awareness of the Manufacturing Skills Certification System, and creating a new workforce development tool for manufacturers called SMARTalent. An online recruitment system, SMARTalent analyzes the jobs needed to meet manufacturers’ future needs and the skills required to fill those jobs, asks managers if the company offers on-the-job training or apprenticeships, and recommends that it look into such opportunities if it currently does not.¹³⁹ But none of MEP’s existing workforce development efforts inform manufacturers of the potential benefits of apprentices or offer services to businesses looking to start an apprenticeship program.

For this reason, MEP should create a new, dedicated apprenticeship program. It can be modeled on ExporTech, a “how-to” program that helps manufacturers begin or expand exporting through: (1) resources to rapidly move from planning to implementation; (2) teaching strategies and success factors based on real-world company research; (3) help building a robust plan in three months; and (4) connecting companies to reputable experts in their communities.¹⁴⁰ One of the key features of the ExporTech program is that other manufacturers from the region are brought in to share their experiences and expertise related to exports. A similar model would work well to help manufacturers begin participating in the apprenticeship program.

Establishing an aggressive effort to raise awareness of the benefits of apprenticeships—and to provide technical assistance for participation targeted specifically to manufacturers—would help MEP achieve its strategic goal of ensuring a strong manufacturing workforce. And statutory authority and funding already exists. In fiscal year 2014, the president requested \$153 million for MEP,¹⁴¹ which should have the authority to establish a new apprenticeship program.

Establish a competitive Economic Development Administration grant for statewide assessments of skills gaps and business assessments of expanding the use of apprenticeships to address these gaps

These grants will support promising state-industry apprenticeship partnerships, prompt states and businesses to consider the value of apprenticeships for addressing workforce development needs, generate interest in apprenticeships among employers, boost knowledge and awareness, and address misconceptions about apprenticeships.

We propose offering a competitive grant program for statewide chambers of commerce or economic development corporations to conduct a needs assessment—that is, methodically identifying a region’s unmet need for skilled workers, the potential efficacy of using apprenticeships to close that gap, and any institutional or cultural barriers that stand in the way. Each award would be between \$25,000 and \$200,000, depending on the size of the state. As a key added bonus, this process also will help to create buy-in for the wide-scale adoption of apprenticeships.

The Economic Development Administration, or EDA, which provides grants to communities in order to generate employment and economic growth, is well positioned to administer the needs assessment grants. The administration has statutory authority to make competitive grants for training, research, and technical assistance.¹⁴² In fiscal year 2014, President Obama requested \$282 million in funding for EDA programs, an increase over the FY 2013 level of \$221 million. In future years, the president should request additional funds to finance 10 of these needs assessments annually.

Moreover, EDA's mission aligns with the goal of expanding apprenticeships by driving business demand for them. The administration's mission is to "lead the federal economic development agenda by promoting innovation and competitiveness, preparing American regions for growth and success in the worldwide economy." Specifically, its investment policy is "designed to establish a foundation for sustainable job growth and the building of durable regional economies throughout the United States" and puts a priority on public-private partnerships.¹⁴³ Apprenticeships fit squarely in that mission.

In fact, there is a great deal of overlap between EDA's mission and that of the Registered Apprenticeship program, as detailed in a guidance letter from the Department of Labor: "Regions that adopt robust Registered Apprenticeship programs in the context of economic development strategies create seamless pipelines of skilled workers and flexible career pathways to meet current and future workforce demands." It continues:

*Registered apprenticeship training can be a valuable tool in the broader suite of talent development approaches that support competitive regional economies and flexible talent that can adapt as jobs grow and/or change. As an employer-driven model for competency development and skills mastery, Registered Apprenticeship can support the development and advancement of worker pipelines for both emerging and established employers and regional industry sectors. Because apprenticeship programs include immediately employment for apprentices, they are an excellent option for dislocated workers and others who are transitioning from declining industries. Registered Apprenticeship programs can also be an important part of industry growth strategies in regions where significant reskilling of the workforce needs to take place.*¹⁴⁴

Establish a new Economic Development Administration competitive grant for states seeking to expand their apprenticeship programs

This grant would enable states that have already conducted an assessment of their skills gap and the potential effectiveness of expanding apprenticeships—or that otherwise already have buy-in by statewide business leaders—to put in place an infrastructure to make the expansion happen. Funding could be used to create or expand state apprenticeship offices, staff, or programs.

This grant would go to a state government, which must apply in partnership with either a chamber of commerce, economic development corporation, or other business association partner. EDA should specify the following preferences and requirements in its request for proposals:

- Should have a business orientation
- Should market apprenticeships to businesses
- Should complete U.S. Department of Labor paperwork for businesses
- Should target high-growth fields or less traditional apprenticeship occupations
- Should educate local Workforce Investment Boards, or WIBs, and One-Stop Career Centers about apprenticeships and specific opportunities
- Should offer “work keys” or other jobs-based skills assessments for employers starting an apprenticeship program
- Must have benchmarks, including the number of registered apprentices and other known competencies you can measure against
- Must expand the number of apprenticeship slots

Grants might range from \$500,000 to \$5 million, depending on the size of the state, and should be renewable for an additional year depending on performance and potential for continued growth.

Offer funding incentives

Establish a federal apprenticeship tax credit for businesses

The federal government should incentivize businesses to hire apprentices by creating a \$1,000 federal tax credit per apprentice, with an additional \$1,000 per year for each apprentice under the age of 25. Government subsidies will help busi-

nesses offset the cost of training apprentices, and other countries and U.S. states that offer subsidies have been able to significantly expand the number of businesses that hire apprentices.

The federal government provides significant aid for college students through Pell Grants and subsidized and unsubsidized student loans, yet there is no automatic and direct assistance for businesses or workers in apprenticeship programs. In contrast, many other nations significantly subsidize the cost of apprenticeships. In England, employers with fewer than 1,000 employees can receive a £1,500 (or about \$2,400) Apprenticeship Grant per apprentice for hiring 16- to 24-year-olds, capped at 10 apprentices over the lifetime of the initiative.¹⁴⁵ In addition, the National Apprenticeship Service covers up to 100 percent of training costs for apprentices between the ages of 16 and 18, up to 50 percent of training costs for those between 19 and 24 years old, and may also contribute some funds for training for apprentices 25 years old and older.¹⁴⁶ And, as noted earlier, South Carolina offers an enticement of a \$1,000 credit per apprentice per year to employers.

We recommend offering a \$1,000 federal tax credit for each new registered apprentice taken on by businesses, employer associations, and joint labor-management organizations over and above 80 percent of their number of apprentices averaged over the previous two years. The credit is refundable and thus available even to organizations with no tax liability,¹⁴⁷ and could be renewed for these apprentices in subsequent years of their program, with a cap of \$4,000 per apprentice. The credit for the current year would be lost if an apprentice leaves the program prematurely. Due to the limited value of the credit, we anticipate that employers are unlikely to attempt to “game the system” by replacing existing employees with apprentices. Still, lawmakers should take care to design the system to prevent such abuse.

Furthermore, to address youth unemployment—and because the benefits of an apprenticeship to workers, employers, and taxpayers is maximized for younger workers—we recommend offering an additional \$1,000 per year per apprentice tax credit for businesses hiring 16- to 24-year-olds into apprenticeship programs (thus receiving \$2,000 per year for each such apprentice, capped at \$8,000 in total). These additional funds will help employers or labor-management organizations provide initial basic or remedial skills training and wraparound services to this population.

Create or expand state subsidies for apprenticeships

States can also offer incentives for businesses to offer apprenticeships and workers to participate in them. This can take the form of:

- Tax credits or direct subsidies to sponsoring businesses, business associations, or labor- management organizations
- Subsidies paid directly to training providers for related classroom-based instruction
- Tax credits or subsidies paid to apprentices
- Reduced or waived tuition for apprentices' related classroom-based coursework in community, technical, or state colleges

States already offering some assistance for apprenticeships could expand that assistance beyond targeted industries, increase benefits, and in some cases simplify eligibility.

Increase Workforce Investment Act dollars going to apprenticeships

As noted earlier, while Workforce Investment Act funds may be used to cover some apprenticeship costs, it is ultimately up to state and local Workforce Investment Boards to make the money available for this purpose. There are some great examples of how these WIA funds have been used; for example, Maryland's State Workforce Investment Board gave \$50,000 of its performance measures incentive funding to the state apprenticeship agency to market apprenticeships.¹⁴⁸ The Department of Labor has released technical guidance and other resources designed to facilitate such use of WIA funding.¹⁴⁹ The department can do more to vigorously encourage the use and prioritization of WIA funds for apprenticeship training through ongoing workshops, webinars, and outreach to states and local Workforce Investment Boards. Some additional steps could also be carefully considered for implementation by the Department of Labor or by Congress in a reauthorization of the Workforce Investment Act:

- Require at least one member of each Workforce Investment Board to be an employer with an active apprenticeship program.
- Require in-person training on apprenticeships for Workforce Investment Board members, including seminars on how to promote and establish apprenticeships.
- Realign performance measures under Title I to best incentivize the workforce investment system to steer jobseekers to apprenticeships.
- Reimburse training providers directly, while holding them accountable for outcomes through performance measures and assessments.
- Streamline eligibility and approval of training providers for WIA funding if they are paid at least in part by sponsors of apprenticeship programs (leveraging due diligence by those sponsors).

Create a pilot program to allow Pell Grants to be used for apprenticeships

The Department of Education has the authority to conduct experiments related to the federal student aid programs. Under this authority, the Department of Education should conduct an experiment in which Pell Grants are made available to individuals engaged in apprenticeship programs. The Department of Education is currently running an experiment for short-term training programs that are shorter than normally would be eligible and for students who already have a bachelor's degree but are preparing for a high-demand job through a certificate program. Allowing the use of Pell Grants for apprenticeships would be a logical extension, and the Department of Education has in fact requested money for such experiments in the president's FY 2014 budget. As those enrolling in an apprenticeship program might otherwise be enrolling in an aid-eligible program, additional program costs should be limited.

Improve access to workers

Improve coordination and referrals by One-Stop Career Centers

The Department of Labor's One-Stop Career Centers, which offer a range of career counseling and employment services to job seekers, should provide workers with information and resources about apprenticeships. Currently, information about apprenticeships is not easily accessible at many centers or on

www.careeronestop.org. As the number of apprenticeship opportunities grows, it will be critical to better train One-Stop Career Center staff to point job seekers in the direction of apprenticeships where appropriate.

Expand pre-apprenticeship programs

Lawmakers, educators, and businesses should work together to create and support pre-apprenticeship programs that create bridges between K-12 classroom studies and apprenticeship programs. These programs partner with a registered apprenticeship sponsor to offer remedial academic instruction, basic workplace skills training, information about potential careers, and occupation-specific training. In Germany, rigorous pre-apprenticeship programs have been particularly helpful in serving at-risk youth.¹⁵⁰ Congress should also consider providing dedicated funding for pre-apprenticeship programs for at-risk youth.

Improve research and standards

Increase funding for quality assurance and auditing

As the number and reach of apprenticeships increase, it will be more important for the Department of Labor to ensure that employers are not simply offering lower wages to workers under the guise of an apprenticeship program that in fact offers little to no quality training. The budget of the Office of Apprenticeship should therefore be increased—initially by at least \$20 million, and with subsequent increases relative to workload—to allow for additional quality assurance and auditing activities to ensure program quality and to prevent exploitation of the apprenticeship model.

Fund research into the costs and return on investment to employers

The Department of Labor should commission a study quantifying the financial costs and benefits to sponsors of apprenticeships. This research is likely to show a strong return to investment and would be a boon to marketing efforts to businesses.

Conduct or fund research into occupations

The Department of Labor, which conducts occupational research, should analyze the cost-effectiveness of apprenticeships in anticipated high-growth occupations. This research could then inform the creation of a list of the most apprenticeable occupations for the coming decade.

Identify new apprenticeable occupations attracting women

With women making up only 6 percent of active American apprentices, the Department of Labor must take more urgent action to identify new apprenticeable occupations in which women comprise a disproportionate share of workers.¹⁵¹ The Department of Labor should emphasize high-growth occupations for which apprenticeships could significantly boost wages. State apprenticeship agencies, as part of their application for federal recognition, should similarly be required to conduct such research in their state labor markets.

Improve access to and updating of RAPIDS data

The Department of Labor should require state apprenticeship agencies to regularly submit program data and statistics to the RAPIDS data system as a condition of federal recognition—and routinely enforce this requirement. Furthermore, the Department of Labor should make updated aggregate data from RAPIDS routinely available to the public at a national and state level to allow for greater analysis of the system.

Encourage states to focus on marketing—not registration

The Department of Labor should continue to allow state apprenticeship agencies to serve as registering agencies in their states. Yet it should also strongly encourage them to allow the Department of Labor to handle this responsibility while states focus instead on marketing. This would not only work to unify standards across states, but it would also free up scarce state resources to focus on an activity in which they have a natural advantage. Of course, this shift presumes additional resources being allocated to the federal Office of Apprenticeship to take on this additional workload.

Create a new tiered set of apprenticeships

The Department of Labor should investigate the creation of new tiers of registered apprenticeships, from standard to advanced to highest. Tiered apprenticeships could provide sponsors with more options for stackable training and might offer workers better career pathways.

Rebrand apprenticeships

To eliminate confusion, the registered apprenticeship program should be rebranded as “modern apprenticeships” and employers should be discouraged—or potentially prohibited—from branding their own unregistered apprenticeship programs as apprenticeships. This will unify standards, eliminate confusion, and help workers and employers alike see apprenticeships for what they are—a tremendously successful, modernized training program.

Facilitate small and medium-sized businesses establishing joint training programs

Policymakers should determine how to best facilitate the establishment of joint training programs in which employers join resources to offer apprenticeship programs. In traditional apprenticeship industries such as the building trades, current and trained employees (not apprentices) and employers typically pay into a trust fund to finance apprenticeships. Policymakers could remove barriers to the creation of such trust funds for employers in nontraditional sectors to join resources and offer joint apprenticeship programs. In one vision of such a system, apprentices’ training costs would be covered by a trust fund, and they would be contractually prohibited from working for nonparticipating employers in that sector for a defined number of years. Alternatively, Congress could authorize a compulsory contribution to an apprenticeship trust fund for a sector, similar to compulsory contributions in the dairy sector that pay for industrywide marketing.¹⁵²

Expand articulation agreements

State policymakers, colleges and universities, accrediting bodies, the Department of Education, and the Department of Labor should work together to greatly expand the number of effective articulation agreements in place. These agreements allow apprenticeship training—both in the classroom and on the job—to count toward degree requirements, and would further embed apprenticeships in a seamless career ladder that would allow workers to continue their formal education after completion of a training program. Pioneering work in Indiana allowing individuals enrolled in a joint apprenticeship training program to obtain an associate’s degree or technical certificate from Ivy Tech Community College offers a strong example for how such a system could be designed.

We do not believe these efforts necessarily will need to incur significant costs, but if they do, we recommend this as a long-term goal, not one that should crowd out limited financial resources that should be dedicated to dramatically increasing the number of apprenticeships available in the meantime. As the number of apprentices grows, there will naturally be increasing pressure on postsecondary institutions to forge such agreements. Furthermore, the important work of making the community and technical college system more responsive to the needs of regional employers as part of any expansion will also open a dialogue that could ease the path to articulation agreements.

Conclusion

Apprenticeships might sound old-fashioned, but there is nothing old-fashioned about the wage premium, career opportunities, and low-cost education afforded to today's apprentices. Nor is there anything old-fashioned about businesses boosting their bottom lines and gaining a competitive edge. The evidence is clear that apprenticeships improve worker outcomes and benefit businesses, explaining why so many other economically advanced countries use them to develop competitive, skilled workforces. By expanding apprenticeships in the United States, policymakers can create pathways to well-paying middle-class jobs for young Americans, while helping businesses meet the need for skilled workers.

In order to do so, lawmakers will need to address a handful of hurdles that have thus far prevented apprenticeships from gaining wider popularity in the United States. In this report, we propose a set of policies that, if enacted, will boost awareness of apprenticeships as an option for workers and businesses alike, create financial incentives for companies to start apprenticeship programs, expand the occupational and gender reach of apprenticeships, and improve our understanding of the financial benefits to apprenticeship sponsors.

America's economic growth depends on possessing a talented, industrious workforce to amplify productivity and inspire innovation. Apprenticeships, though underutilized, are a highly effective method of training and education that delivers a big return on public investment. We should embrace apprenticeships and begin training America's workers for the high-skill, high-wage jobs of tomorrow.

Appendix: Existing funding sources for apprenticeships

The Workforce Investment Act currently allows public dollars to help support apprenticeships. The following is a brief summary, based on Department of Labor guidance, of funding streams that may be leveraged:

- **Individual Training Accounts, or ITAs:** Under the Workforce Investment Act, unemployed workers who need training can receive a voucher at a One-Stop Career Center. This voucher can pay for training at any state-approved training program or provider. Entities carrying out registered apprenticeship programs can be eligible providers, and it would be up to local Workforce Investment Boards, or WIBs, to enumerate application procedures for apprenticeship sponsors. ITA funds can be used for the instruction portion of apprenticeships, as well as to access pre-apprenticeship training to prepare for an apprenticeship.
- **On-the-job training, or OJT:** In these partnerships, the public workforce system pays for up to 50 percent of wages for workers (or in states with waivers, up to 75 percent for businesses with 100 or fewer employees) participating in an on-the-job training program. The content of OJT is basically determined by employers, and providers of OJT have streamlined eligibility requirements.
- **Customized training:** Workforce Investment Boards and One-Stop Career Centers can use customized training, which could either be a course of training for all apprenticeship sponsors in a particular sector or for a group of workers at one company. The employer enters into a contractual agreement with a local WIB and: (1) agrees to hire individuals who successfully complete training, or to keep them on in the case of existing employees; and (2) pays at least 50 percent of the training costs, unless a waiver has been granted by ETA for a sliding scale based on business size (10 percent or more for businesses with 50 or fewer employees, and at least 25 percent for businesses with 51–100 employees).

- **WIA statewide reserve funds:** Governors may reserve 15 percent of funds given to states for adult, dislocated worker, and youth activities for more flexible use. These funds could be used for apprenticeship and/or pre-apprenticeship programs.
- **WIA Adult and Dislocated Worker Programs:** States have received waiver authority to use up to 50 percent of their Adult and Dislocated Worker funds as if they were state set-aside funds. In such cases, these funds can go toward eligible apprenticeship costs.
- **WIA Title V incentive funds** are very flexible and can also be used for programs in partnership with apprenticeship sponsors; they basically can be used to carry out programs under WIA Titles I and II and the Carl D. Perkins Vocational and Technical Education Act. Funding of these incentive grant plans may be modified, with approval from the Department of Labor, to incorporate apprenticeships.
- **Trade adjustment assistance** funds may be approved for trade-affected workers to receive training as part of a registered apprenticeship, so long as a number of criteria are met.
- **State funds** may be used, whether they are from general accounts or other pots of money, such as education dollars for career and technical education.

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Endnotes

- 1 *National Apprenticeship Act of 1937*, 29 U.S.C. 50.
- 2 Chris Rhodes, "U.K. House of Commons Library Standard Note: Apprenticeships policy," available at <http://www.parliament.uk/briefing-papers/Sn03052.pdf> (last accessed October 2013).
- 3 Employment and Training Administration, "Registered Apprenticeship: Employers," available at <http://www.dol.gov/OA/employer.cfm> (last accessed August 2013).
- 4 Information provided by the Building and Construction Trades Department's Research Department.
- 5 Stephen Steigleder and Louis Soares, "Let's Get Serious About Our Nation's Human Capital: A Plan to Reform the U.S. Workforce Training System" (Washington: Center for American Progress, 2012).
- 6 ManpowerGroup, "2012 Talent Shortage Survey Research Results" (2012).
- 7 Debbie Reed and others, "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States" (Washington: Mathematica Policy Research, 2012).
- 8 Steigleder and Soares, "Let's Get Serious About Our Nation's Human Capital."
- 9 Anthony P. Carnevale, Nicole Smith, and Jeff Strohl, "Recovery: Job Growth and Education Requirements Through 2020" (Washington: Georgetown University Center on Education and the Workforce, 2013), available at <http://cew.georgetown.edu/recovery2020/>.
- 10 Ibid.
- 11 Ibid.
- 12 ManpowerGroup, "ManpowerGroup Annual Talent Shortage Survey Reveals U.S. Employers Making Strides to Build Sustainable Workforces, Report Less Difficulty Filling Open Positions," Press release, May 28, 2013, available at <http://press.manpower.com/press/2013/talentshortage2013/>.
- 13 Business Roundtable, "Getting Ahead — Staying Ahead: Helping America's Workforce Succeed in the 21st Century" (2009).
- 14 Manufacturing Institute, "2011 Skills Gap Report," available at <http://www.themanufacturinginstitute.org/Research/Skills-Gap-in-Manufacturing/2011-Skills-Gap-Report/2011-Skills-Gap-Report.aspx> (last accessed October 2013).
- 15 Authors' analysis of Department of Labor data.
- 16 Deloitte, "Manufacturing opportunity: A Deloitte series on making America stronger" (2012).
- 17 The Boston Consulting Group, "Skills Gap in U.S. Manufacturing Is Less Pervasive Than Many Believe," Press release, October 15, 2012, available at <http://www.bcg.com/media/pressreleasedetails.aspx?id=tcm:12-118945>.
- 18 Authors' calculations based on data from the Bureau of Labor Statistics, "Employment Projections 2010–20," available at <http://www.bls.gov/news.release/pdf/ecopro.pdf> (last accessed August 2013).
- 19 Robert Atkinson, Testimony before the U.S. Senate Finance Committee, "Hearing on Tax Reform Options: Incentives for Capital Investment and Manufacturing," March 6, 2012.
- 20 David Finegold and others, "The Decline of the U.S. Machine-Tool Industry and Prospects for Its Sustainable Recovery: Vol. 1" (Santa Monica: RAND, 1994).
- 21 Carnevale and others, "Recovery."
- 22 Bureau of Labor Statistics, "Employment Situation Summary," available at <http://www.bls.gov/news.release/empsit.nr0.htm> (last accessed August 2013).
- 23 Steigleder and Soares, "Let's Get Serious About Our Nation's Human Capital."
- 24 Business Roundtable, "Getting Ahead — Staying Ahead."
- 25 CollegeBoard, "Trends in College Pricing 2012" (2012).
- 26 Ibid.
- 27 CollegeBoard, "Student Aid 2012 Source Data," available at http://trends.collegeboard.org/sites/default/files/student-aid-2012-source-data_01122013.xls (last accessed August 2013).
- 28 Business Roundtable, "Getting Ahead — Staying Ahead."
- 29 *Consumer Reports*, "Student debt: Your threat," May 2012.
- 30 Rohit Chopra, comment on "Too Big to Fail: Student debt hits a trillion," Consumer Financial Protection Bureau Blog, comment posted March 21, 2012, available at <http://www.consumerfinance.gov/blog/too-big-to-fail-student-debt-hits-a-trillion/> (accessed August 28, 2013).
- 31 The Institute for College Access and Success, "Student Debt and the Class of 2011" (2012).
- 32 Lacey Johnson, "Young Adults See Student Debt as Growing Unmanageable, Poll Finds," *The Chronicle of Higher Education*, November 9, 2011, available at <http://chronicle.com/article/Young-Adults-See-Student-Debt/129705/>.
- 33 Business Roundtable, "Getting Ahead — Staying Ahead."
- 34 Accenture, "Accenture 2013 College Graduate Employment Survey: Key Findings" (2013), available at <http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-2013-College-Graduate-Employment-Survey.pdf> (last accessed August 2013).
- 35 Steigleder and Soares, "Let's Get Serious About Our Nation's Human Capital."
- 36 Department of Labor, "FY 2013 Congressional Budget Justification: Employment and Training Administration," available at <http://www.dol.gov/dol/budget/2013/PDF/CBJ-2013-v1-12.pdf> (last accessed August 2013).
- 37 Reed and others, "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States."

- 38 Employment and Training Administration, *Workforce System Results: For the Quarter ending September 30, 2012* (Department of Labor, 2013).
- 39 Bureau of Labor Statistics, "Employment Projections 2010–20."
- 40 Robert I. Lerman, "Training Tomorrow's Workforce: Community College and Apprenticeship as Collaborative Routes to Rewarding Careers" (Washington: Center for American Progress, 2009).
- 41 Washington State Department of Labor & Industries, "Benefits for Worker & Employer," available at <http://www.lni.wa.gov/TradesLicensing/Apprenticeship/About/Benefits/> (last accessed August 2013).
- 42 Employment and Training Administration, *Training and Employment Guidance Letter No. 15-10* (Department of Labor, 2010), Attachment 2 ("Credential Resource Guide").
- 43 South Carolina Chamber of Commerce, "Apprenticeship: An Important Avenue for Building a Skilled Workforce in South Carolina" (2002).
- 44 Robert I. Lerman, "Apprenticeship in the United States: Patterns of Governance and Recent Developments." In Peter Schlögl and others, eds., *Situated Competence Development Through Innovative Apprenticeships: The Role of Different Stakeholders* (Vienna: International Network on Innovative Apprenticeship, 2008).
- 45 Robert Lerman, Lauren Eyster, and Kate Chambers, "The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective" (Washington: The Urban Institute, 2009).
- 46 Lerman, "Apprenticeship in the United States."
- 47 Authors' calculations based on Department of Labor data.
- 48 Lerman, Eyster, and Chambers, "The Benefits and Challenges of Registered Apprenticeship."
- 49 Department of Labor, "Employment Law Guide: David-Bacon and Related Acts," available at <http://www.dol.gov/compliance/guide/dbra.htm> (last accessed October 2013).
- 50 See, for example, New York State Department of Labor, "Register an Apprenticeship Program," available at <https://labor.ny.gov/apprenticeship/general/sponsor-registration.shtm> (last accessed October 2013).
- 51 Department of Labor, "Registered Apprenticeship Fact Sheet," available at <http://www.doleta.gov/programs/factsht/pdf/apprenticeship.pdf> (last accessed October 2013).
- 52 Nick Collins, "University degree 'worth less than some apprenticeships,'" *The Telegraph*, April 8, 2013, available at <http://www.telegraph.co.uk/education/education-news/9977310/University-degree-worth-less-than-some-apprenticeships.html>.
- 53 Warwick Institute for Employment Research, "Review of Apprenticeships Research: A summary of research published since 2010" (2012).
- 54 South Carolina Chamber of Commerce, "Apprenticeships in South Carolina: Baseline Report and Recommendations" (2003).
- 55 Ibid.
- 56 Canadian Apprenticeship Forum, "It Pays to Hire An Apprentice: Calculating the Return on Training Investment for Skilled Trades Employers in Canada—A Study of 16 Trades, Phase II" (2009).
- 57 Canadian Apprenticeship Forum, "The Apprenticeship Advantage: Earning Return on Training Investment," available at http://apprenticeshippays.com/english/PDFeng/Advantage_ROT1.pdf (last accessed August 2013).
- 58 Louise Carus Mahdi, Nancy Christopher, and Michael Meade, eds., *Crossroads: The Quest for Contemporary Rites of Passage* (Peru, Illinois: Carus Publishing, 1996), pp. 136–137.
- 59 Information provided by the Building and Construction Trades Department's Research Department.
- 60 Reed and others, "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States."
- 61 State of Washington Workforce Training and Education Coordinating Board, "2013 Workforce Training Results by Program: Apprenticeship," available at http://www.wtb.wa.gov/Documents/2_Apprenticeship_2013.pdf (last accessed November 2013).
- 62 State of Washington Workforce Training and Education Coordinating Board, "2013 Workforce Training Results by Program: Community and Technical Colleges Professional-Technical Education," available at http://www.wtb.wa.gov/Documents/3-CTC-PT_2013.pdf (last accessed November 2013).
- 63 State of Washington Workforce Training and Education Coordinating Board, "2013 Workforce Training Results by Program," available at <http://www.wtb.wa.gov/WorkforceTrainingResults.asp> (last accessed November 2013).
- 64 Ibid.
- 65 Jennifer Erickson and Michael Ettlinger, eds., "300 Million Engines of Growth: A Middle-Out Plan for Jobs, Business, and a Growing Economy" (Washington: Center for American Progress, 2013).
- 66 Ibid.
- 67 South Carolina Chamber of Commerce, "Apprenticeships in South Carolina."
- 68 Steigleder and Soares, "Let's Get Serious About Our Nation's Human Capital."
- 69 Jack Evans, "U.K. House of Commons Library Standard Note: Apprenticeship statistics," available at <http://www.parliament.uk/briefing-papers/SN06113.pdf> (last accessed August 2013).
- 70 Employment and Training Administration, "Data and Statistics: Registered Apprenticeship National Results," available at http://www.doleta.gov/OA/data_statistics.cfm (last accessed August 2013).
- 71 Department of Labor, "FY 2014 Department of Labor Budget in Brief" (2013).
- 72 Robert Lerman and Felix Rauner, "Apprenticeship in the United States." In Antje Barabasch and Felix Rauner, eds., *Work and Education in America: The Art of Integration* (New York: Springer Press, 2012).
- 73 Sarah Ayres, "America's 10 Million Unemployed Youth Spell Danger for Future Economic Growth" (Washington: Center for American Progress, 2013).

- 74 Sarah Ayres, "The High Cost of Youth Unemployment" (Washington: Center for American Progress, 2013).
- 75 Authors' analysis of Bureau of Labor Statistics and Office of Apprenticeship data.
- 76 South Carolina Chamber of Commerce, "Apprenticeship."
- 77 Bureau of Labor Statistics, "Economic News Release: College Enrollment and Work Activity of 2012 High School Graduates," available at <http://www.bls.gov/news.release/hsgen.nr0.htm> (last accessed August 2013).
- 78 Shannon Patterson, "Smith-Hughes Act of 1917 (PL 347)," available at <http://jschell.myweb.uga.edu/history/legis/smithhughes.htm> (last accessed October 2013).
- 79 New York City Mayoral Task Force on Career and Technical Education Innovation, "Next-Generation Career and Technical Education in New York City" (2008).
- 80 James E. Rosenbaum, *Beyond College for All* (New York: Russell Sage: 2001).
- 81 Data from The Data Service, "Apprenticeships," available at http://www.thedata-service.org.uk/Statistics/fe_data_library/Apprenticeships/ (last accessed July 2013).
- 82 Evans, "Apprenticeship statistics."
- 83 Centre for Economics and Business Research, "Productivity Matters: The Impact of Apprenticeships on the UK Economy" (2013).
- 84 Centre for Economic Performance, "Apprenticeship policy in England: Increasing skills versus boosting young people's job prospects" (2011).
- 85 Tony Dolphin and Tess Lanning, eds., "Rethinking Apprenticeships" (London: Institute for Public Policy Research, 2011).
- 86 BBC, "Apprenticeships to be 'the new norm,' says David Cameron," March 11, 2013, available at <http://www.bbc.co.uk/news/uk-21734560>.
- 87 Ibid.
- 88 Centre for Economics and Business Research, "Productivity Matters."
- 89 Purpose, "National Apprenticeship Service — Campaign," available at <http://purpose.co.uk/our-work/national-apprenticeship-service-campaign/> (last accessed November 2013).
- 90 Apprenticeships, "Young Developers from Nottingham named winners of Apprenticeship Design Challenge," July 24, 2013, available at <http://www.apprenticeships.org.uk/News-Media/Latest-News/Article348.aspx>.
- 91 Warwick Institute for Employment Research, "Review of Apprenticeships Research."
- 92 Ibid.
- 93 Ibid.
- 94 Dolphin and Lanning, eds., "Rethinking Apprenticeships."
- 95 AAT and the Centre for Economics and Business Research, "University education: Is this the best route into employment?" (2013).
- 96 Centre for Economics and Business Research, "Productivity Matters."
- 97 Employment and Training Administration, "Data and Statistics."
- 98 Centers for Disease Control and Prevention, "Establishment of the CDC Public Health Informatics Fellowship Program As a Department of Labor Registered Apprenticeship," available at http://www.cdc.gov/phifp/downloads/PHIF-DOL_4-20-12.pdf (last accessed August 2013).
- 99 Organisation for Economic Co-operation and Development, "OECD Note on 'Quality Apprenticeships' for the G20 Task Force on Employment," available at <http://www.oecd.org/els/emp/OECD%20Apprenticeship%20Note%2026%20Sept.pdf> (last accessed August 2013).
- 100 Data provided by the Office of Apprenticeship at the Department of Labor.
- 101 Evans, "Apprenticeship statistics."
- 102 Robert I. Lerman, "Can the United States Expand Apprenticeship? Lessons from Experience" (American University, Urban Institute, and IZA, 2012).
- 103 Arkansas Department of Finance and Administration, "Business Incentives and Credits," available at <http://www.dfa.arkansas.gov/offices/exciseTax/TaxCredits/Pages/BusinessIncentivesandTaxCreditPrograms.aspx#40> (last accessed October 2013).
- 104 California Department of Education, "Apprenticeship Education Program Summary," available at <http://www.cde.ca.gov/ci/ct/ap/apprent07summary.asp> (last accessed October 2013); California Employment Training Panel, "Employment Training Panel Approves \$7.4M to Fund Workforce Training and Support Apprenticeship Programs," Press release, August 24, 2012, available at http://www.labor.ca.gov/pdf/August_ETP_Press_Release.pdf (last accessed October 2013).
- 105 Connecticut Department of Revenue, "Apprenticeship Credit," available at <http://www.ct.gov/drs/cwp/view.asp?a=3807&q=523960> (last accessed October 2013).
- 106 Florida Department of Education, "Benefits of Apprenticeship," available at <http://www.fldoe.org/workforce/apprenticeship/benefits.asp> (last accessed October 2013).
- 107 Iowa Workforce Development, "Funding Opportunities for Apprenticeships," available at <http://www.iowaworkforce.org/apprenticeship/funding.htm> (last accessed October 2013).
- 108 Kansas Registered Apprenticeship, "Funding Opportunities," available at <http://www.kansasapprenticeship.org/Pages/FundingOpportunities.aspx> (last accessed October 2013).
- 109 Maine Career Center, "Maine Apprenticeship Program," available at <http://www.mainecareercenter.com/services-programs/training/apprenticeship/index.shtml> (last accessed October 2013).
- 111 Missouri Department of Economic Development, "Youth Opportunity Program," available at <http://ded.mo.gov/BCS%20Programs/BCSProgramDetails.aspx?BCSProgramID=85> (last accessed October 2013).
- 112 State of New Jersey Department of Labor and Workforce Development, "Youth Transitions to Work Program: Notice of Grant Opportunity, Fiscal Year 2013," (2012).

- 113 State of New Jersey Department of Labor and Workforce Development, "Incentives & Training Programs: Apprenticeship Training," available at <http://lwd.dol.state.nj.us/labor/wnpjpin/employer/training/Apprenticeship.html> (last accessed October 2013).
- 114 Rhode Island Department of Labor and Training, "Rhode Island Tax Credits," available at <http://www.dlt.ri.gov/bwc/taxcredits.htm> (last accessed October 2013).
- 115 Apprenticeship Carolina, "Resources," available at <http://www.apprenticeshipcarolina.com/resources.html> (last accessed October 2013).
- 116 Texas Workforce Commission, "Apprenticeship: Program Overview," available at <http://www.twc.state.tx.us/svcs/apprentice/apprenticeship-program-overview.html> (last accessed October 2013).
- 117 Virginia Department of Taxation, "Tax Credits," available at <http://www.tax.virginia.gov/site.cfm?alias=TaxCredit> (last accessed October 2013).
- 118 Washington State Board for Community and Technical Colleges, "Apprenticeship Fee Guidance," available at <http://www.sbctc.ctc.edu/college/workforce/2013-14feeguidance.docx> (last accessed October 2013).
- 119 W. Va. Code §11-13W-1.
- 120 Employment and Training Administration, "Data and Statistics."
- 121 Canadian Apprenticeship Forum, "It Pays to Hire An Apprentice."
- 122 Employment and Training Administration, "Data and Statistics."
- 123 Ibid.
- 124 Department of Labor, "Apprenticeship Final Rule Fact Sheet," available at http://www.doleta.gov/OA/pdf/Apprenticeship_Final_Fact_Sheet.pdf (last accessed October 2013).
- 125 The Manufacturing Institute Skills Certification System, "Getting Started," available at http://www.themanufacturinginstitute.org/~media/45214790579A437ABAD0C92DFE4975CA/Getting_Started.pdf (last accessed October 2013).
- 126 Ibid.
- 127 United Kingdom, "Guide: Apprenticeships," available at <https://www.gov.uk/apprenticeships-guide/applications-and-qualifications> (last accessed October 2013).
- 128 Registered Apprenticeship, "At-a-Glance: Recognition of State Apprenticeship Agencies, Apprenticeship Final Rule, 29 CFR Part 29," available at http://www.doleta.gov/OA/pdf/Recognition_of_State_Apprenticeship_Agencies_SAAs.pdf (last accessed October 2013).
- 129 Apprenticeship Carolina, "A Foundational Timeline of Apprenticeship Carolina," available at <https://21stcenturyapprenticeship.workforce3one.org/view/2000911471112255751> (last accessed November 2013).
- 130 Ford Foundation, "Bridges to Opportunity for Underprepared Adults: A State Policy Guide for Community College Leaders" (2008).
- 131 Ivy Tech Community College, "Apprenticeship programs within Indiana," available at <http://www.ivytech.edu/academics/apprenticeships-state.html> (last accessed November 2013).
- 132 Indiana Plan for equal employment, "Frequently asked questions," available at <http://www.indianaplan.org/faqs.html> (last accessed November 2013).
- 133 Organisation for Economic Co-operation and Development, "OECD Note on 'Quality Apprenticeships' for the G20 Task Force on Employment."
- 134 Robert W. Glover and Cihan Bilginsoy, "Registered apprenticeship training in the US construction industry," *Education & Training* 47 (4/5) (2005): 337–349.
- 135 Ibid.
- 136 Lerman, "Apprenticeship in the United States."
- 137 Brad Cooper, comment on "First Lady Announces 125,000 Veterans and Military Spouses Hired Through Joining Forces," White House Joining Forces blog, comment posted August 22, 2012, available at <http://www.whitehouse.gov/blog/2012/08/22/first-lady-announces-125000-veterans-and-military-spouses-hired-through-joining-forc> (accessed August 30, 2013).
- 138 Bureau of Labor Statistics, "Labor Force Statistics from the Current Population Survey," available at http://www.bls.gov/web/empsit/cpseea16.htm#cps_eande_m16f1 (last accessed September 2013).
- 139 Manufacturing Extension Partnership, "Creating an Innovation Practice: A Guide to Manufacturing Workforce Systems and the SMARTalent Tool," available at <http://www.nist.gov/mep/upload/Workforce-Guide.pdf> (last accessed August 2013).
- 140 The National Institute of Standards and Technology, "ExporTech," available at <http://www.nist.gov/mep/exportech.cfm> (last accessed August 2013).
- 141 \$25 million of this amount is designated for Manufacturing Technology Acceleration Centers, or M-TACs.
- 142 The Public Works and Economic Development Act of 1965 as amended gives the Economic Development Administration the authority to issues grants for "training, research, and technical assistance, including grants for program evaluation and economic impact analyses, that would be useful in alleviating or preventing conditions of excessive unemployment or underemployment" (42 U.S.C. 3147). Eligible recipients include "a public or private nonprofit organization or association acting in cooperation with officials of a political subdivision of State," thereby including chambers of commerce and many regional economic development corporations.
- 143 Economic Development Administration, "Mission," available at <http://www.eda.gov/investmentPriorities.htm> (last accessed August 2013).
- 144 Employment and Training Administration, *Training and Employment Guidance Letter No. 2-07* (Department of Labor, 2007).
- 145 United Kingdom National Apprenticeship Service, "Apprenticeship Grant for Employers of 16 to 24 year olds: Employer Fact Sheet," available at <http://www.apprenticeships.org.uk/employers/other-questions.aspx#Question23> (last accessed August 2013).
- 146 United Kingdom National Apprenticeship Service, "Q&As," available at <http://www.apprenticeships.org.uk/employers/other-questions.aspx> (last accessed August 2013).

- 147 Similar to the refundable tax credit for small tax-exempt employers under the Affordable Care Act, a new apprenticeship credit would only be refundable up to an employer's income tax withholding and Medicare tax liability.
- 148 Employment and Training Administration, *Training and Employment Guidance Letter No. 2-07*.
- 149 Ibid.; Employment and Training Administration, *Training and Employment Notice 44-11*.
- 150 Isabelle de Pommereau, "Global education lessons: Germany's respected voc-tech path with Meisters," *The Christian Science Monitor*, September 1, 2013, available at <http://www.csmonitor.com/World/2013/0901/Global-education-lessons-Germany-s-respected-voc-tech-path-with-Meisters>.
- 151 Data provided by the Office of Apprenticeship at the Department of Labor.
- 152 For basic information about the dairy checkoff program, see Dairy Checkoff, "About Us," available at <http://www.dairycheckoff.com/AboutUs/Pages/AboutUs.aspx>. For a more complete legislative history, see Dairy Checkoff, "History of Dairy Promotion," available at <http://www.dairycheckoff.com/AboutUs/Pages/HistoryofDairyPromotion.aspx>.

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