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European Apprenticeship A Model for the U.S.?

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Can a dual study system
find a place in U.S.
education?

What can the U.S.
learn from European
apprenticeship
experiences?

This overview of the apprenticeship systems of Germany, the United Kingdom, France, and Hungary follows an AICGS study tour to these countries in October 2014.¹ We identified best practices among key stakeholders in preparing their workforces for careers in manufacturing and information technology. In this Issue Brief, we provide a snapshot of each country's system and its relevance for the United States.

There is renewed interest in apprenticeship in the United States, United Kingdom, France, and Hungary. Each of these countries has a school-based vocational system, where technical training mostly takes place at secondary schools and technical colleges. The UK has come the furthest in recent years in promoting work-based education, which has led to an impressive cultural and political change and an expansion of apprenticeship in fields beyond the traditional manufacturing and construction trades. France and Hungary have been less successful in engaging their private sectors in apprenticeship. In these two countries, vocational education is still perceived less as a vital component of national skill development and more as a matter of social policy.

Germany's system of dual education has been the topic of much critical analysis over the decades. Combining substantial practical training at firms (and paid by firms) with theoretical instruction at secondary and even post-secondary schools is a defining feature. Germany also boasts robust networks of employers, educators, and other social actors that work together to support and adapt apprenticeship to the demands of global competition, which has the added advantage of spreading the costs and administrative burden across many actors. Recent assessments recognize the relevance of this system for the United States, but some also criticize its lack of flexibility and inclusiveness.

For U.S. policymakers, the complexity and depth of the German system is certainly far beyond American vocational institutions' limited resources, low status, and low level of standardization. There is much to admire in the UK expansion, but expectations for the United States must be tempered given the importance of localities in shaping the education system and the real budgetary constraints at the national level for investing in technical education. Furthermore, it remains to be seen to what extent are U.S. policymakers, employers, and educators interested

in better aligning the vocational education system with the needs of industry and improving students' transition from school to work.

As these brief country profiles suggest, there has nonetheless been sustained and growing interest by policymakers and businesses across countries to envision training systems that equip

Country Profile: Germany

KEY FACTS

Number of apprentices:	1.4 million	(2012)
Apprentices per 1,000 employed:	40	(2012)
GDP growth:	1.7%	(2014 forecast)
Manufacturing value added (% of GDP):	20%	(2012)
Unemployment rate:	6.7%	(August 2014)
Youth unemployment rate:	4.6%	(2013)

Overview

Vocational training in Germany typically occurs in occupational apprenticeship programs. Traditionally, more than 50 percent of each age cohort choose one of the roughly 350 available apprenticeship programs that lead to a professional career (in recent years, a majority of students are enrolling in research universities).² German apprenticeship programs typically last between two and three years. They are often referred to as “dual” apprenticeship programs, as education and training takes place both at vocational schools and at companies. Upon completion, and after having passed a standardized test administered by the Chamber of Industry and Commerce, apprentice graduates receive a certificate, which is valid nationwide, and which signals their skills and competencies qualifying them for a particular occupation, such as mechatronics. In Germany, apprenticeships are thus highly formalized and standardized vocational training programs.³

There is a recent trend within the German vocational training landscape in that dual study programs are gaining increasing traction.⁴ These programs are dual vocational programs at the tertiary level, meaning that the theoretical instruction typically takes place at a college or academy, and that graduates often-times receive a Bachelor's degree, which enables them to continue their academic studies. This model is considered increasingly useful to attract and retain ambitious high school graduates for middle-management positions and supervisory roles in the production process.

Results

While businesses bear almost 75 percent of the cost of the dual vocational training system, there is a strong business case to make for investments in apprenticeship training formats. From a business perspective, the dual apprenticeship model has several important benefits. First, it is a reliable way for a business to recruit new members into its workforce. Second,

workers with the necessary skills and competencies to remain competitive in the marketplace. As such, the United States finds itself in good company. In the following, we pay particular attention to what the U.S. could learn and potentially adapt from each of these European countries' experience with apprenticeship.

the close integration of theoretical instruction with practical training provides apprentices with the necessary skill and competency set to contribute to the high productivity levels German companies typically enjoy. Finally, apprenticeship programs tend to create a loyal workforce; while this is slowly changing, long-term employment is still the norm in the manufacturing sector, and companies reap the benefits of their investments in the training of their workforce.

The main advantage of the German model of dual apprenticeships is that it leads to a close match of the skills and competencies provided as part of the vocational education and training (VET) on the one hand, and the skills needed and required for employment on the other. At the macro-economic level, this has resulted in surprisingly low (youth) unemployment levels, even during economic downturns. And at the micro firm level, the dual apprenticeship model ensures a high degree of employability. Also, dual apprenticeship programs have proven to be effective in training a skilled and professional workforce capable of being highly productive and innovative. In fact, Germany's strength in high quality manufacturing is often explained by referring to the important role of *Facharbeiter* (skilled workers having completed an apprenticeship) in the production process.

However, the German dual apprenticeship system has come under criticism as well. The highly structured regime governing apprenticeship programs at times seems slow in responding to new and emerging business needs and occupations, such as information technology. Also, there continues to be a lack of integration between apprenticeship programs at the secondary level and higher education at the tertiary level, inhibiting (social) mobility and further education pathways.⁵

Relevance for the U.S.

The German vocational training approach is embedded in a complex system of institutionalized relationships and coordination processes between various organizations, including labor unions and employer associations. It is based on regulatory frameworks and national law, such as the Vocational Training Act of 1969 (*Berufsbildungsgesetz*). As such, transferring the whole system to the U.S. context is not possible. Specifically, tracking high school students before the age of 18 into a vocational career track would be inconceivable for U.S. policymakers. Yet, from a business standpoint, it makes sense to take the idea of combining practical training at the firm level with theoretical instruction at secondary and especially post-secondary schools—thus adapting the concept to fit the U.S.

context.⁶

The U.S. environment does indeed provide companies with existing resources to build on in order to implement German-style apprenticeship programs. For example, the close net of local community and technical colleges can be used to supply students with post-secondary theoretical instruction. Similarly, the Department of Labor has established a list of criteria and a national “Registered Apprenticeship” system that aims to incorporate a growing number of such programs across the country.

Given the important normative role of college education in the United States, dual study programs seem particularly promising. In fact, college integration, for example by relying on local community colleges or even testing programs at universities, may be a useful way to attract ambitious and talented high school students for vocational training programs.

Country Profile: United Kingdom

KEY FACTS

Number of apprentices:	931,000	(2013/2014)
Apprentices per 1,000 employed:	20	(2012)
GDP growth:	3.2%	(2014 forecast)
Manufacturing value added (% of GDP):	9.0%	(2012)
Unemployment rate:	6.2%	(June 2014)
Youth unemployment rate:	10.1%	(2013)

Overview

There are actually several different apprenticeship systems in the United Kingdom (including Scotland, Wales, and Northern Ireland), but England has invested the most in recent years to reform and expand opportunities in career and technical education. Apprenticeships are defined quite broadly as “paid jobs that incorporate on and off the job training” and the National Apprenticeship Service created in 2009 has been at the forefront in marketing the expansion of this form of workforce education.⁷

There are close to 200 apprenticeships (called “apprenticeship frameworks”) covering over 1,500 job titles and roles (in Germany, there are only around 331 recognized training occupations). The apprenticeship framework includes a National Vocational Qualification (NVQ) assessing work-based skills and a Technical Certificate assessing theoretical competencies and other skills such as numeracy and literacy.⁸ The broad definition of apprenticeship and significant investment in England has led to an expansion of work-based placements in traditional manufacturing, but also in other fields from the creative arts to the financial services industry.

The UK has repeatedly tried to foster and extend its underdeveloped apprenticeship system.⁹ Today, it still has a relatively small vocational training sector compared to other industrial-

Apprenticeship programs are still little known in the United States. As such, devising and implementing these programs will require significant resources to market such a novel training route for American students, parents, and the wider public. To accomplish this effectively, it makes sense for government to encourage firms to partner with other organizations and create networks or clusters that cooperate in offering apprenticeship programs together. As part of a network, each individual company can reduce its own cost burden significantly.

Importantly, data suggests that companies are successful in retaining their apprenticeship graduates. Many companies report retention rates of about 70 to 80 percent five years after completion of the program. As such, U.S. businesses should look into dual apprenticeship programs as promising routes to recruit, train, and retain their skilled workforce, in order to manage future growth and improve productivity levels.

ized countries and it has found it challenging to reach the high standards common in other vocational training systems such as Germany, Switzerland, or Austria. Academic literature helps explain this by referring to the institutional fabric of the UK as a liberal market economy, where skills and competencies are typically acquired and then traded on markets, as opposed to in apprenticeship-based training formats.¹⁰ At the same time, this absence of a strong vocational training regime is somewhat surprising, as the UK used to have a very strong focus on manufacturing as well, where the most established apprenticeship programs can be found in continental European countries. As manufacturing has lost some of its relevance for the UK, and as the financial sector has grown tremendously, reviving and fostering apprenticeship programs has required a concerted effort by private industry, educators, and all political parties.

Existing vocational training formats in the UK do not focus exclusively on workplace experience. Practical training is often-times administered at technical colleges as well as at a variety of private training agencies in the classroom or online. As a result, stakeholders have complained about the complexity of the system with its many different training and degree options. The apprenticeship system in the UK is based on National Vocational Qualifications as a competency-based framework, which until recently limited the role of employers and other stakeholders, such as labor unions, in developing curricula and deciding on training content. This approach has been criticized as a largely government-led top-down approach to vocational education and training,¹¹ but private employers and training companies have also worked together to establish a variety of innovative apprenticeship programs.

Apprenticeship programs typically last between one and two years. Most UK apprenticeship programs are still relatively low-level. However, the number of apprentices has risen dramatically in the UK—a four-fold increase in enrollment in less than a decade.¹² A significant portion of this increase is due to

apprenticeship having increased its scope to include areas such as IT or health care. Also, the UK lifted its upper age limit of 25 in 2004, thus broadening the pool of potential applicants for apprenticeship programs significantly.¹³ In fact, today 45 percent of new apprentices are older than 25, which suggests that a large portion of UK apprenticeship programs are established to provide further training for older workers, as opposed to initial vocational training for young students, which is typically the case in countries such as Germany and Austria.¹⁴ There is a concern, however, that the rapid increase in apprenticeship programs has undermined quality standards. The UK's apprenticeship system may have grown so complex in recent years that it is increasingly difficult to have a clear understanding and definition of what actually constitutes an apprenticeship program.

Results

Despite these broader systemic concerns, the government has boasted two million new apprenticeship starts since 2010 and aims to add one million more by 2020. Reportedly, many UK firms have shown a strong commitment to this effort as they see apprenticeship as a tool to provide the necessary skills in order to create and sustain a competitive workforce in today's global high-tech economy. The UK system has adapted to business needs by offering a broad variety of awarding organizations and degrees. Training agencies also help provide apprentices to small and medium-sized enterprises, if they lack the resources to do so by themselves. While the complex system may make apprenticeship less attractive to some employers and students, there are signs that it is increasingly accepted that apprenticeship offers a viable pathway for

students and can address the skills gap in many industries, including but not limited to the growing IT sector. To realize this potential, stronger collaboration between various stakeholders will be necessary in order to agree on common standards and certification procedures.

Relevance for the United States

Both the UK and the U.S., face a similar challenge in expanding apprenticeships and achieving the full benefit of a close integration between practical training and theoretical instruction. For example, the educational landscape in the UK is characterized by "further education" colleges, which generally play a similar role as community colleges in the United States. These colleges can be used to cover large parts of the theoretical instruction in apprenticeships and are also typically very business-oriented. More generally speaking, the UK and the U.S. are often viewed as being very similar in their institutional setting, suggesting that they should experience similar challenges in creating and sustaining apprenticeships.¹⁵

There is a broad political consensus in the UK on the value and necessity of expanding apprenticeship. This is reflected in the range of financial incentives provided by the national government, including substantial subsidies for off-the-job training both for young adults and older workers as well as a £1,500 grant for small companies taking on apprentices for the first time. However, weak links between employers, colleges, and other agencies, such as government bodies or labor unions, seem to stand in the way of further expanding apprenticeships in scale and scope in both the UK and the U.S.

Country Profile: France

KEY FACTS

Number of apprentices:	430,000	(2012)
Apprentices per 1,000 employed:	17	(2012)
GDP growth:	0.5%	(2014 forecast)
Manufacturing value added (% of GDP):	9.0%	(2012)
Unemployment rate:	10.3%	(July 2014)
Youth unemployment rate:	10.0%	(2013)

Overview

Vocational training in France is still primarily school-based, though there has been an expansion in dual education (*formation en alternance*) in recent years.¹⁶ One form of training (*apprentissage* or apprenticeship) is typically for lower-skilled positions (such as manual trades) that are connected with secondary vocational schools (CFAs or vocational *lycées*), while the professional alternance are connected with post-secondary programs at universities. Both routes offer paid positions that include on and off-the-job training as defined by an employment contract.

Apprenticeship in France is defined by national labor laws. French apprentices must be between the ages of 16 and 25; the average is around 20.¹⁷ A national mandate requires companies with more than 250 employees to maintain 4 percent of their employees as apprentices (5 percent beginning in 2015). Taxes are levied on companies for the development of vocational programs to train these apprentices, a process that is administered by Registered Collection Agencies (OPCA). Apprentices must also earn a defined percentage of the national minimum wage, based on their age and the number of years in the program, from 25 percent of the minimum wage for those under age 18 in their first year to 78 percent for those over 21 in their third year.

The system has also put in place financial incentives to encourage companies to train more apprentices. There is a tax credit of €1,600 per apprentice and companies with less than 250 employees receive an additional €1,000/apprentice. In 2013, 56 percent of new apprentices in 2013 worked in companies with ten or fewer employees. It is unclear, however, whether the incentives encourage companies to actually hire their apprentices—only 65 percent of apprentices in 2013 were hired while 30 percent were unemployed and 5 percent were inactive.

There are about 1,500 apprentice training centers under the auspice of the Ministry of Education, which is responsible for administering theoretical instruction. In recent years, the twenty-six local regions have taken over more responsibility in defining the objectives and financing for apprenticeship programs. Most apprenticeship programs last two years, but there is considerable variation depending on the employer and occupation. For the professional *alternance* alone, there are 18,000 different certificate programs on record with the government.

Recent initiatives by the French government have been designed to promote dual education. The Copenhagen process put vocational education and training high on the agenda in France and elsewhere in Europe and the governments have encouraged apprenticeships as means to foster social cohesion, as can be seen from the Social Cohesion Plan.¹⁸ The current goal is to increase the number of apprentices from 430,000 to 500,000 by 2017 (25 percent of apprenticeships are in industry, 40 percent in construction, and 10 percent in services). Apprenticeship, however, still suffers from low status and reputation, with only about 35 percent of students opting for the vocationally-oriented school route.

Results

Vocational training in general terms, and apprenticeships more specifically, are still largely regarded as a part of social policy. Such training is offered as an alternative education pathway for weaker students, as opposed to tapping the potential of these training formats to improve all students' transition from school to work or develop solutions to challenging demographic developments. Businesses have traditionally played a small role in the design and implementation of programs, which continue to be mostly school-based. There is also little integration between programs at the secondary and the tertiary level. However, France is in the process of recognizing the potential value of vocational training programs at the tertiary

level and is trying to promote these programs.

Businesses in France are not used to taking much responsibility for coordinating apprenticeship programs. Frameworks are largely designed by national and regional educational institutions even though employers are required to commit financial resources through the tax levy. Employers in general would like to have more of a voice in choosing their apprentices, be able to develop closer relationships with schools, and gain bargaining power with unions, which usually pay for vocational instructors and are also represented on school boards. An "Ambassadors of Industry" program that sends current apprentices to schools and public forums to talk about their jobs to their peers has increased awareness and interest of apprenticeship, but broader institutional challenges remain.¹⁹

Relevance for the U.S.

The French school-based model of VET has similarities with the United States, but its approach to apprenticeship in particular may be unattractive for U.S. policymakers. Businesses have not been fully engaged in the process and are only just beginning to learn how to take on more responsibilities in workforce training. So far, they have largely relied on the government to provide their skilled workforce without having to invest much of their own time and resources besides the automatic tax levy.

As we see in other countries, business must be able to play an active role in shaping an apprenticeship system. Apprenticeships will remain a useful tool to create the skills and competencies needed for reviving French industry, which used to be very strong in the past, but is still suffering from the recent economic downturn. Where the United States could learn from France is its long experience with school-based vocational training programs at the secondary and tertiary level. A better integration of apprenticeships at the high school level and at four-year colleges (not just community colleges) could be a powerful tool to prepare interested students for a vocational career.²⁰

Country Profile: Hungary

KEY FACTS

Number of apprentices:	48,000	(2014)
Apprentices per 1,000 employed	12	(2014; author est.)
GDP growth:	1.1%	(2013)
Manufacturing value added (% of GDP)	23%	(2010)
Unemployment rate:	7.1%	(October 2014)
Youth unemployment rate:	25%	(2013)

Overview

Apprenticeship in Hungary is primarily school-based and used to be a traditional education pathway under the Soviet Union. Today, however, workplace-based vocational training programs

suffer from a certain stigma in Hungary.²¹ Most students favor more general forms of education, which tend to be associated with better job prospects despite a persistently high youth unemployment rate. The current government has tried hard to foster apprenticeships in recent years through various financial incentives. This training route is seen as providing the necessary skills and competencies for an increasingly manufacturing-oriented economy and a step toward lowering (youth) unemployment.

In 2013, Hungary began implementation of a new vocational training system, informed in part by lessons from the German system of dual apprenticeship training, combining existing theoretical training at vocational schools and increasing the opportunities for practical training, especially with private companies. As of today, 40 percent of Hungarian vocational

students are enrolled in dual apprenticeship programs. Dual apprenticeship programs are seen as a viable strategy to create skills according to business demand, and also function as a social policy tool.

Hungary thus seems to be determined to push its vocational training system further. The objective is to have 70,000 apprenticeship contracts in 2018. In order to attain this objective, the government is also marketing vocational training at the post-secondary level. Furthermore, the state offers financial incentives to participating companies and also tries to reduce the administrative burden for them in the process of administering an apprenticeship program.²² More generally, responsibility for administering and overseeing vocational training has been centralized.²³ For example, the government creates lists of occupations where there is a shortage of skilled labor based on input from twenty regional development councils; students interested in apprenticeship programs in these occupations are then supported by grants.

Results

The recent reforms have allowed the national government to largely take over responsibility for VET from local government. Content and curricula are standardized in National Qualification Registers²⁴ and while Hungary's vocational training system continues to be school-based, the government has given greater authority to business chambers to expand practical and workplace-based education in cooperation with employers. In 2010, the Hungarian government only provided HUF 100 million (\$400,000) to vocational schools to provide the necessary machines and tools to train students (only 60 percent of these funds went toward equipment and probably 40 percent to classes). Hungarian technical schools benefited from this recent investment, but it did not necessarily improve student outcomes—only 60 percent of graduates at one technical school in the capital of Budapest we interviewed were employed and just 30 percent had a contract with a sponsoring firm.

Nonetheless, more and more practical training is taking place in an enterprise setting. Typically, this arrangement involves a separate contract between the apprentice and the enterprise, which also pays an allowance to the student. This approach is viewed as providing a better fit with the labor market, and as such should increase employability of apprentice graduates. More generally, there is a rather strong link between acquired certificates and occupations in Hungary. The number of apprenticeship contracts from 1998 to 2014 increased seven fold (6,600 – 48,000), but decreased slightly from 2012 to 2014.

Hungary still faces a number of challenges in educating its workforce: 70 percent of students in lower secondary schools fall below PISA standards, 50 percent of 19 year olds have no qualification, and the VET school dropout rate has only decreased slightly from a high of 30 percent. This suggests that apprenticeship programs continue to lack necessary repu-

tation and value in the eyes of many students. One potential problem is that apprentices in Hungary tend to be quite young and relatively unprepared for the rigors of work placements. The government is nonetheless seeking to reduce the age from 18 to 16 for workplace-based vocational training programs. School-based vocational training programs can be entered as early as age 14.

Notably, higher-level apprenticeship programs in Hungary (qualification ISCED level 3 under the European Qualification Framework) are typically offered in more service-oriented occupations, such as cook, hairdresser, or waiter.²⁵ There are fewer high-level apprenticeships offered in more high-tech manufacturing occupations—a growth area for the Hungarian economy. Siemens only recently opened a \$2.2 million facility in Budapest to train approximately 100 students in welding and industrial mechanics.

Relevance for the United States

Hungary is a remarkable case study of a country trying to develop a well-functioning dual apprenticeship system more or less from scratch. While it can certainly draw on its apprenticeship heritage from its communist past, the reputation as well as regulatory infrastructure for vocational education remained dormant after 1990. However, the results of the recent top-down push from the federal government to foster apprenticeship programs are not yet clear.

Hungary's manufacturing industry, spurred by joining the European Union in 2004, has undergone tremendous growth. With this comes a number of challenges, such as a highly competitive and fluid labor market with skilled workers frequently switching jobs. Reaping the benefits of their investments in apprenticeship programs in this kind of environment is a key challenge for firms in Hungary. U.S. firms face similar challenges when implementing apprenticeship programs.²⁶ Poaching is a serious concern for many firms investing in the education and training of their workforce, though well-established apprenticeship programs are able to instill high levels of firm loyalty—making this long-term investment pay off.²⁷

Another key challenge in Hungary and the United States is how to foster better cooperation between schools and industry. For apprenticeships to work, cooperation between these two stakeholders must be systematic. The Hungarian system relies on chambers of industry to facilitate these links, thus following at least one component of Germany's social partnership approach. This is difficult to emulate in the U.S. context, though entities such as local workforce development boards could play a functionally equivalent role.

Conclusion

There is a growing interest across different countries in developing apprenticeship programs, combining workplace-based learning with theoretical instruction. There is also broad agreement that this type of arrangement allows for matching skills and competencies with the needs and demands of business. As such, this model, which originated in Continental Europe, is slowly diffusing, and is being emulated by countries well beyond Europe. The challenge remains to adapt and scale elements of this model in local contexts unused to this form of work-based education.

One key challenge for the United States will be to create and sustain governance mechanisms that ensure standardization and certification. Here, we envision local and regional solutions to be most promising. This may involve state-wide approaches, inter-organizational networks, or regional clusters. In these processes, business will have to play a key role in creating apprenticeship programs in coordination with a diverse range of intermediaries. While business is an important driver, addressing the skills gap is ultimately a collective challenge.

NOTES

1 Parke Nicholson, Kimberly Frank, Cass Conrad, Sarah A. Steinberg, and Johann Fortwengel, "Elements of Apprenticeship in Europe" (Washington, DC: American Institute for Contemporary German Studies, November, 2014), <http://www.aicgs.org/site/wp-content/uploads/2014/11/AICGS-Site-Visit-Summary-2014.pdf>

2 Bundesministerium für Bildung und Forschung, *Berufsbildungsbericht 2014: Der Ausbildungsmarkt verändert sich* (2014).

3 Kathrin Hoeckel and Robert Schwartz, *A Learning for Jobs Review of Germany 2010* (OECD Reviews of Vocational Education and Training, 2010).

4 Lukas Graf, Justin J.W. Powell, Johann Fortwengel, and Nadine Bernhard, *Dual Study Programmes in Global Context: Internationalization in Germany and Transfer to Brazil, France, Qatar, Mexico and the U.S.* (Bonn: German Academic Exchange Service, 2014).

5 Ibid.

6 Justin J.W. Powell and Johann Fortwengel, "'Made in Germany' – Produced in America? How dual vocational training programs can help close the skills gap in the United States," *AICGS Issue Brief 47* (Washington, DC; American Institute for Contemporary German Studies, May 2014).

7 James Mirza-Davies, *Apprenticeships policy. Standard Note* (House of Commons Library, 2014).

8 Ibid.

9 For example, the government commissioned two reviews in 2012, one conducted by Jason Holt, and another one by Doug Richard (see Pauline Musset and Simon Field, *A Skills beyond School Review of England. OECD Reviews of Vocational Education and Training* (OECD Publishing, 2013): 20). Richard, for example, suggested to reduce the complexity of the apprenticeship system by having only one qualification for each apprenticeable occupation. The report by Holt focused specifically on ways to make apprenticeships more feasible for small and medium-sized employers.

10 David Finegold and David Soskice, "The failure of training in Britain: Analysis and prescription," *Oxford Review of Economic Policy* 4:3 (1988): 21-51.

11 Employers are to blame for this development, too, as they initially showed little interest in developing the National Vocational Qualifications framework according to their needs and preferences. See Michael Young's "National qualifications frameworks: their feasibility for effective implementation in developing countries," *EMP/SKILLS Working Paper No. 22* (ILO Publishing, 2005).

12 Pauline Musset and Simon Field, *A Skills beyond School Review of England. OECD Reviews of Vocational Education and Training* (OECD Publishing, 2013).

13 Natalia Cuddy and Tom Leney, *Vocational education and training in the United Kingdom: Short description* (Luxembourg: European Center for the Development of Vocational Training, 2005).

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15 Peter A. Hall and David Soskice, eds., *Varieties of capitalism: The institutional foundations of comparative advantage* (Oxford: Oxford University Press, 2001).

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17 Hillary Steedman, *The State of Apprenticeship in 2010* (London: London School of Economics and Political Science, Center for Economic Performance, 2010).

18 CEDEFOP, *Vocational education and training in France: Short description* (Luxembourg: Publications Office of the European Union, 2008).

19 Hillary Steedman, *The State of Apprenticeship in 2010* (London: London School of Economics and Political Science, Center for Economic Performance, 2010).

20 Lukas Graf, Justin J.W. Powell, Johann Fortwengel, and Nadine Bernhard, *Dual Study Programmes in Global Context: Internationalization in Germany and Transfer to Brazil, France, Qatar, Mexico and the U.S.* (Bonn: German Academic Exchange Service, 2014).

21 CEDEFOP, *Vocational Education and Training in Hungary: Short Description* (Luxembourg: Publications Office of the European Union, 2011).

22 Parke Nicholson, Kimberly Frank, Cass Conrad, Sarah A. Steinberg, and Johann Fortwengel, "Elements of Apprenticeship in Europe" (Washington, DC: American Institute for Contemporary German Studies, November, 2014), <http://www.aicgs.org/site/wp-content/uploads/2014/11/AICGS-Site-Visit-Summary-2014.pdf>

23 CEDEFOP, *Spotlight on VET Hungary* (Luxembourg: Publications Office of the European Union, 2014).

24 CEDEFOP, *Vocational Education and Training in Hungary: Short Description* (Luxembourg: Publications Office of the European Union, 2011) and CEDEFOP, *Spotlight on VET Hungary* (Luxembourg: Publications Office of the European Union, 2014).

25 CEDEFOP, *Vocational Education and Training in Hungary: Short Description* (Luxembourg: Publications Office of the European Union, 2011).

26 Justin J.W. Powell and Johann Fortwengel, "'Made in Germany' – Produced in America? How dual vocational training programs can help close the skills gap in the United States," *AICGS Issue Brief 47* (Washington, DC; American Institute for Contemporary German Studies, May 2014).

27 Johann Fortwengel, "Upgrading through Integration? The Case of the Central Eastern European Automotive Industry," *Transcience Journal* Vol. 2, No. 1 (2011), http://www2.hu-berlin.de/transcience/Vol2_Issue1_2011_1_25.pdf

What are elements of a successful apprenticeship system? To what degree should businesses be engaged in educating their workforce, and what other actors should participate in decision-making and evaluation? How can apprenticeship fit within the existing education system? The AICGS project “Employment, Education, and Training: Apprenticeship Models in Europe and the United States” looks to answer these questions, drawing on lessons from the European experiences that can be applied to the U.S. system. A group of experts participated in AICGS’ study tour to Germany, France, Hungary, and the United Kingdom, visiting employers and schools where the apprenticeship model is flourishing. The recommendations in this Issue Brief stem from the group’s experiences in Europe, and offer a candid assessment of the viability of such a system for the United States.

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European Apprenticeship A Model for the U.S.?

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