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Skill Mismatches in Contemporary Labor Markets: How Real? And What Remedies?

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November 2013

The concept of labor market “mismatch” implies that employers seek a set of skills or credentials that they have difficulty finding among workers—in other words, that their *demand* for certain skills exceeds the *supply* of such skills among American workers. Economists generally believe that labor markets adjust to such imbalances, especially over time. But it is also possible that such mismatches can persist for many years or decades; and that public policy interventions to improve the skill sets of workers and their matches to employer needs might be appropriate in such cases.

Are American labor markets plagued by “mismatches” between the skills sought by employers and those held by employees? If so, what kinds of skills or credentials (which signal skill attainment to employers) are in short supply, relative to demand? Are these credentials relatively *general*, as in the overall attainment of higher education? Or is the shortfall pronounced in education or training that is more *specific* to certain occupations and industries? Does the problem primarily exist in the short-run, or does it seem to persist over time? Will private sector labor market adjustments by employers and workers resolve these problems on their own, or are public policy interventions necessary and helpful?

Skills and the U.S. Labor Market

Before we can analyze the extent to which mismatches plague the U.S. labor market, we must define which skills we are talking about and how they are measured, as well as how these skills are treated in the labor market.

Labor market *skills* can be categorized as *general* or *specific*, where the former define a range of worker attributes that are valued by large percentages of employers while the latter are more unique to particular occupations or industries. The needed general skills might include some fairly basic ones, such as cognitive skills and job-readiness (e.g., showing up on time every day, appropriate attitudes towards employer, etc.) as well as higher-order skills, like

analytical/problem-solving and social/communication abilities.¹ The specific skills are those necessary to carry out the tasks required on any particular job—such as being an accountant or machinist or plumber.

Unfortunately, most of these skills are not directly observable to employers when they make their decisions on which individual applicants to hire (and they are often not even observable to researchers in the form of data). Accordingly, employers often seek *credentials*, such as educational degrees attained or other certifications (like occupational licenses or certificates) as signals of general ability, while the major or field in which the credential is obtained signals its specificity.²

We can then think of a labor market as embodying a demand for skills among employers and its supply among workers, as measured by overall levels of education (or degrees received) as well as degrees or credentials in specific fields. Such markets should produce equilibrium wage and employment outcomes for different categories of workers, reflecting the relative demand for and supply of those credentials and those fields (as we describe more fully in figure 2 below).

Of course, wages and salaries are not always set at equilibrium levels; government regulations, institutions (like unions), and employer human resource policies might all lead wages to be set above or below that level. Indeed, these institutions can change how the market functions, on both the supply and demand sides, in fundamental ways.³ If wages are set above the market-clearing level, a limited numbers of “good jobs” might be rationed by employers to workers with the highest skills who are willing to accept such employment, a process that is described in a variety of other labor market models (e.g., worker signaling [Spence 1973] or sorting [Weiss 1983]).

But, even if wages are not always set at market-clearing levels, it is often very useful to think of the supply of and demand for general and specific education credentials, and how these shift over time. For instance, technological change and the forces of globalization (in the form of immigration, trade and offshoring) seem to shift employer demand away from the practice of very routine tasks to those requiring higher levels of skill (Autor and Acemoglu 2012); in the long run, these forces can give employers a great deal of choice over how to structure their workplaces, where to locate them, and what kinds of tasks must be performed by workers who are hired.

¹See, for instance, the report by the Secretary’s Commission on Achieving the Necessary Skills (or SCANS – U.S. Department of Labor, 1991, Holzer (1996) and Moss and Tilly (2001).

²To gain more person-specific information about any particular applicant, employers will also review previous work experience and references, and hold personal interviews, though the power of the latter to really predict worker performance on the job is questionable (Cascio 2003).

³A long literature on “efficiency wages” suggests that employers might find it optimal to set wages above their market-clearing levels, because the higher wages reduce search or monitoring costs as well as job turnover (Katz, 1986). Employers might also choose to create “high performance workplaces” in which higher pay is provided for more productivity as an alternative to competing through low costs and higher turnover. See Bernhardt et al. (2003) and Holzer et al. (2011).

Worker decisions on how much and what kinds of education to obtain then determine the supply of labor with those skills/credentials (Becker 1975). These skill investment decisions, of course, are also influenced by employers (who provide formal or informal on-the-job training) and by public policy (through the provision of public schools, loans/scholarships, subsidies for higher education, etc.). But, either way, the available evidence suggests that changes in the supply of and demand for higher education over time have enormous explanatory power when it comes to understanding trends in relative wages and employment over time in the U.S. (Autor et al. 2008; Goldin and Katz 2008), in ways that other labor market models cannot do.⁴

Of course, the processes by which employers and workers are “matched” to one another in the labor market are not necessarily simple or straightforward. In a labor market where workers and jobs are very heterogeneous in quality, even within educational categories, and where many attributes of one are not easily observable to the other, lengthy periods of search might be required by both before job offers are made and accepted (Mortensen and Pissarides 1999). For employers, this search process involves the recruitment and screening of applicants, with attempts to gauge their quality in a variety of ways; for workers, it involves a process of searching and applying for jobs using a range of formal or informal methods (Holzer 1987, 1988). And, while such searches sometimes occur while workers are still employed and jobs filled, they often must be done while workers are unemployed and jobs vacant. Accordingly, the supply of workers with appropriate skills and the levels of demand for these workers, as well as the efficiency of the search processes, will determine durations of unemployment and vacancy among individual workers and jobs, and the rates of (frictional) unemployment and vacancies that are observed in the market.

Why Might There Be a Skills Mismatch in the U.S.?

The answers to the questions about whether the U.S. now experiences any kind of skill mismatch, and whether they will persist over time, vary with the nature of the mismatch we are considering. One example of mismatch involves what economists call “structural unemployment,” in which employers have difficulty filling existing job vacancies because workers lack the skills to fill such vacancies, at least in particular local labor markets. This kind of mismatch might exist because of ongoing shifts in labor demand across sectors and occupations, perhaps caused by new technologies or globalization, to which workers have difficulty adjusting.

The relationship between unemployment and job vacancy rates, and between cyclical and structural unemployment, can be summarized in what economists call the “Beveridge Curve” that appears in figure 1. The curve plots a negative relationship between these two rates, and economies move along any particular curve as they move through the business cycle (for instance, from point A to B as we go from a tight labor market to one characterized by a recession.) But, if the structure of the economy and/or worker demographics change, in ways that

⁴Professor Lawrence Katz of Harvard University argues that rising returns to education account for roughly two-thirds of the growth of inequality in earnings for all but the top .5% of American workers in the past three decades (see his talk at the American Enterprise Institute on September 7, 2012: <http://www.youtube.com/watch?v=YJnAy472UTc&feature=relmfu>). Sorting or signaling models of the job market generally do not help account for the dramatic increases in returns to education in recent years.

generate more frictional or structural unemployment, the Beveridge Curve shifts out (and an economy might move from point B to C), as there are now more vacant jobs associated with any level of unemployment.

Some degree of structural unemployment likely exists at any point in time, and perhaps contributes to the non-inflationary rate of unemployment (or NAIRU) of 4–5% at the peak of the business cycle. But demand shifts and structural unemployment might also have grown in the aftermath of the Great Recession, if the downturn has been accompanied by permanent shifts in the sectoral or occupational composition of American jobs to which unemployed workers adjust slowly. Also, the geographic locations of jobs might interact with worker skills and business needs, in that the workers who have the skills to fill a given set of jobs might be located in other states or regions that where the jobs are located, until either the workers or the employers migrate geographically to where the other can be found (e.g., Blanchard and Katz 1992).

Another potential result of labor market mismatch might be growing gaps and inequality between the earnings of skilled and unskilled workers, rather than unemployment. Such inequality in the U.S., especially between workers with and without college degrees, has grown dramatically over the past three decades, and might be at least partially attributable to imbalances in the demand for and supply of higher education.

Such a possibility is illustrated in figure 2, which plots demand curves for and supply curves of skilled and unskilled labor (represented by S_k and U_n respectively). A high level of demand for skilled relative to unskilled labor, coupled with a limited relative supply of such labor, combine to generate large earnings gaps between the two groups in equilibrium.

Even among those with college degrees, imbalances between relative demand and supply can grow between those with and without advanced postgraduate degrees. In addition, growing inequality can also be found at the same level of education between those who have specialized in different fields, and who now work in specific occupations and industries; and inequality can also grow in compensation within these categories, perhaps reflecting imbalances in the quality and performance of workers (which ultimately affect promotion rates and compensation returns to different levels of occupations) as well as their credentials.

Of course, it is possible to have a surplus of workers with some skills or credentials (and thus an oversupply) as well as a shortage (or undersupply) of those with others (Quintini 2011). A rising demand for skills relative to its supply can generate an oversupply of workers with high school or lower credentials as well as an undersupply of those with college degrees; and shifts across fields will generate both kinds of imbalances, especially in the short run, as well as specific skill obsolescence among well-educated workers in declining sectors (CEDEFOP 2010). Oversupplies of educated workers, relative to demand, could also occur because of imperfect expectations and information among students, or because of how employers seek to fill limited numbers of high-wage jobs.⁵

⁵For instance, “cobweb” models of labor market suggest that students tend to overly concentrate in occupations that pay higher salaries at the beginning of their college or graduate school careers, not realizing that many other students will make similar investments that drive down relative wages dramatically in these fields (Freeman 1971). Sorting and signaling models of the labor market also suggest possible overinvestment in skills as individuals try to signal

But, if market forces operate even remotely as the standard model suggests, an oversupply of highly educated workers should lead to downward pressure on their wages, relative to workers with lower levels of education, and that is not something we have observed in the US labor market in the past 40 years.⁶ Instead, the empirical evidence suggests that college-educated workers have mostly been in short supply, relative to demand, in the U.S. in recent decades; and that this is even more true in particular fields and in the market for advanced degrees, as we note below.

And, while the Great Recession and our slow labor market recovery in its aftermath have created excess supplies of labor at all levels of skill, this appears to be much less true for the highly educated than for other workers, and is certainly not expected to last indefinitely (Holzer and Hlavac 2011).

Why do Mismatches Exist and Persist?

Whenever mismatches exist, economists expect both workers (especially future workers who might be students) and employers to face incentives to adjust their behavior until the mismatch disappears.

For instance, economic theory suggests that, when labor demand rises for any given skill or credential and exceeds its supply in the market, the relative wages and salaries of workers who have these skills should rise. That, in turn, will incent more workers and/or employers to invest in such skills, and eventually their supply among workers should also rise, thus reducing or eliminating any earnings inequality (or unemployment) that might have initially resulted.

This process is illustrated in figure 3. In part A, an upward shift in the demand for skilled labor immediately creates a shortage of such labor of the magnitude AB; this, in turn, puts upward pressure on wages (or compensation more broadly) for that group. As their wages rise, the gap between the quantities supplied and demand falls, until a new equilibrium is reached at point C.

But a set of longer-term responses should also occur, that are presented in part B of the diagram. The now higher wages for workers with this level of skill induce more workers to invest in those skills—perhaps, for instance, by attending a postsecondary institution and obtaining the degree in question. The supply of such labor might continue to grow until the market returns to the earlier relative wage of this group at point B. Alternatively, the adjustment process might be impeded for a variety of reasons, and the supply of labor with this skill might rise only until we reach point E, thus implying a longer-term increases in relative wages.

employers their higher quality relative to other workers, regardless of whether the education enhances productivity and performance.

⁶Freeman (1976) documented declining relative wages for college graduates through the middle-1970s, perhaps as a result of overinvestments in college by students trying to avoid the draft during the Vietnam War. The relative wages of college to high school graduates then rose over most of the following 25 years. While real earnings of college graduates have stagnated since 2000, those of people with advanced degrees have continued to grow in real and relative terms (Mishel 2010).

Accordingly, skill mismatches need not be a permanent feature of the labor market. Surpluses and shortages of particular skills should not persist indefinitely, as both employers and workers adjust to signals of imbalance provided by the market.

Of course, there might be a lag of several years between the appearance of any such mismatch and the skill investments needed to counter it. This is particularly true for higher education, where it can take many years for individuals to earn the degrees that have become better compensated. If new institutional arrangements need to be made to provide the needed classroom capacity for educating larger numbers (for instance, by colleges or by employers), then the market adjustments will take even longer.

On the other hand, the higher inequality between more- and less-educated workers in the U.S. has persisted now for decades (Autor et al. 2008); while the labor markets in some specific occupations and industries (e.g., nursing or machinists) seem to be perpetually tight. This might be true because a range of “market failures” and other problems characterize these markets and impede the adjustment process.

With regards to higher education, the supply of college graduates might lag behind growing demand over time for a variety of reasons, including the poor cognitive and analytical skills of U.S. students emerging from the K–12 education system and high dropout rates there; and the high and growing costs of college in the U.S., especially when many American families are “liquidity-constrained” and lack sufficient savings (or the ability to borrow in capital markets) to finance college (Heckman and Lafontaine 2007; Haskins et al. 2009; Bound et al. 2009; Lovenheim 2010).

Shortfalls in the specific education credentials sought by employers in particular sectors could persist because students lack information about the job market, especially regarding which professions are in high demand. Some occupations might also require certain technical skills that American students have difficulty acquiring (or courses that they simply don’t like). Even when students want to study in high-demand areas, public colleges (both 2-year and 4-year) as well as private non-profits may lack the financial resources or incentives to expand teaching capacity in areas of high demand, if instructors or equipment in such areas are expensive (as in nursing and other forms of health technology).⁷

And a lack of training for specific occupations and industries might occur at the high school level as well. American public education might fail to provide workers with sufficient occupational skills in high-demand sectors because it has not invested sufficiently in the development of high-quality career and technical education, at least partly due to controversies about “tracking” minority or disadvantaged students away from college preparation (Symonds et al. 2008; Hoffmann 2011).

⁷Altonji et al. (2012) review the most recent evidence on differences in economic rewards to different college majors and fields, while also presenting models of choice of major that stress student preferences and uncertainty about their abilities early on that constrain choices in later periods. The lack of information among students as well as institutional capacity to provide skills in high-demand areas, especially at community colleges, are stressed by Furchtgott-Roth et al. (2009).

When employers have difficulty finding appropriately educated workers to hire or promote, they should have more incentive to provide on-the-job education or training for their newly hired or incumbent workers, either on-site or off-site. But American employers invest relatively little in training for their non-professional and non-managerial employees. Economists have argued for decades that, the more general the training, the less likely employers will pay for it, as they are less likely to earn the returns on such investments when their trained workers leave the firm and go elsewhere; without an industry-wide institutional mechanism to provide such training, it may not occur. In addition, employers might underinvest in training because of financial constraints, a lack of information on or experience with such training, a lack of scale required for such investments to be efficient, or simply because they don't have confidence in the underlying skills and motivations of their workers (Barron et al. 1997; Acemoglu and Pischke 1998; and Lerman et al. 2004).

In such situations, employers might choose to offshore or outsource some parts of the production process (Blinder 2007), or to organize their workplaces in a manner that doesn't make them too dependent on skills that might require such investments. They might choose production locations (either domestically or overseas) where the supplies of workers with the needed skills are more ample, or where the compensation levels for unskilled workers are lower than in the U.S. (Moretti 2012; Atkinson and Ezell 2012).

What Does the Evidence Show?

What kinds of evidence might indicate the existence of mismatches, either in terms of unemployment or earnings inequality? Structural unemployment can be inferred from the level of unemployment relative to job vacancies, as implied by the Beveridge Curve analysis in figure 1; while inequality in earnings between (or within) education groups can be useful for inferring mismatches in the demand for and supply of workers in equilibrium. Other data, on test scores (which give us some evidence on the supply of general skills) and from surveys of workers and employers can also help sort out employer task/skill demand relative to worker supply and how they evolve over time.

Regarding unemployment, we have some recent evidence to suggest that the job vacancy rate in the U.S. today is somewhat higher than in earlier periods with high unemployment (Elsby et al. 2010), even though there are still about 3 unemployed workers per vacant job; the higher ratio of vacancies to unemployment suggests some growth in structural unemployment. At the same time, most recent studies do not suggest that skill or geographic mismatches account for much of this increase; instead, it is mostly attributed to various other factors, such as the relatively high and temporary availability of extended Unemployment Insurance benefits and high levels of uncertainty that currently exist among employers and workers (Daly et al. 2012).

Still, other evidence suggests that imbalances across states between the supply of and demand for workers with higher education might add roughly a percentage point or more to the unemployment rate (Estevao 2011). And in some particular industries (like manufacturing), a high ratio of vacant jobs to recent hires implies some difficulty among employers in finding the workers they need, especially for smaller firms (Holzer 2011).

Regarding inequality between workers with and without college degrees, such inequality has clearly grown in the past three decades, while the growth in the supply of workers with such degrees has flattened (Goldin and Katz 2008). Indeed, while college enrollments have risen over time, the completion rates of students attending college have fallen, thus preventing the attainment of postsecondary degrees among workers from increasing by much. Completion rates are particularly low for low-income and/or minority students, those attending part-time, and those attending 2-year and non-elite 4-year colleges (Bound et al., 2009). Our college attainment rates have also fallen behind those of many other nations in recent years, which is consistent with a greater widening of the gap between the college-educated and others over time in the U.S. than elsewhere.⁸

Though economists continue to debate how much of the growing inequality is due to such “market forces” as opposed to institutional changes in the labor market (such as declining unionism and reduced minimum wage levels relative to market wages), most mainstream economists believe that the failure of the supply of college-educated labor to keep up with demand growth has contributed importantly to growing inequality, which thus reflects an ongoing mismatch between the demand for such credentials and their supply.⁹ Recent earnings growth has been even more pronounced for those with advanced degrees, likely reflecting similar imbalances. And growing inequality among those who have college or higher degrees likely reflects a high market return to “stars” with very strong job performance (Rosen 1981), presumably reflecting their greater scarcity relative to employer demand for them (Lemieux et al. 2007; Bloom and Van Reenen 2010; Moretti 2012).

Does the same hold true for more occupation- and industry-specific training? Here the evidence is somewhat thinner, but some can be found. For instance, there has been some debate recently about the extent to whether jobs at the AA, BA and advanced degrees in the fields of science, technology, engineering and math (or STEM) pay a premium relative to similarly educated workers in other fields, and whether or not Americans are under-enrolling in these fields. The best recent evidence suggests that such a premium exists and has grown over time, suggesting a growing gap between demand and supply for STEM, though this might reflect either the weak math preparations of Americans or their preferences for less technical studies and work (Carnevale et al. 2011; Langdon et al. 2012).

Below the BA level, the economic rewards to associate degrees and occupational certificates, relative to those with high school diplomas only, have held steady or grown in recent years (Autor 2010), especially in technical or high-demand fields like health care. While there has been much discussion recently of declining labor demand in middle-skill jobs, this is mostly accounted for by the disappearance of high-wage production and clerical jobs for high school graduates. Demand for some kinds of postsecondary education or training short of a BA in fields such as health technicians, legal or protective services, installation/maintenance/repair jobs all

⁸See Goldin and Katz for evidence on relative attainment of college degrees across nations and Haskins et al. (2009) and Bound et al. (2009) for discussion of the causes of our relatively lower completion rates in the U.S. Trends in basic skill attainment, as measured by cognitive test scores, are also consistent with our diminishing relative rates of higher education attainment (Hanushek et al. 2012).

⁹This debate is best-captured in recent papers by Card and Dinardo (2007) as well as Autor et al. (2008).

appear to be strong, as evidenced by both employment and relative wage growth in these areas (Holzer and Lerman 2007).¹⁰

And, while the Great Recession has clearly dampened such demand in construction and manufacturing (Jaimovich and Siu 2012), hiring in these sectors will likely recover eventually, at least to some extent. These interpretations are supported by a range of descriptive survey data (Holzer and Lerman 2007) or even news stories, in which employers have reported difficulty finding semiskilled technicians (like machinists or precision welders), even at the trough of the recession (Uchitelle 2009; Fletcher 2011).

Recent evidence also shows the persistence of quite strong returns to employer-provided on-the-job training, in terms of worker earnings and also worker productivity (Hollenbeck, 2008). Some recent data also suggest growing investments by American employers in on-the-job training (ASTD 2011), but much of this growth seems accounted for by investments in professional and managerial employees.

A few more bits of evidence on skill mismatch are relevant as well. For one thing, though projections of future labor market demand do not always have great track records, some credible forecasts (especially outside the Bureau of Labor Statistics) suggest strong ongoing demand for postsecondary education and training at all levels (Carnevale et al. 2010). The upcoming retirements of Baby Boomers, and their replacement in the market by less-educated (on average) immigrants, will likely cause gaps between the future supply of and demand for educated and trained workers to persist at the sub-baccalaureate, BA and higher levels (Holzer and Lerman 2007).

What do other measures of skill demand, besides those based on education, tend to show? Surveys of employers also consistently report strong (and sometimes unmet) demand for higher-level analytical and communication skills, as well as basic job-readiness in low-wage labor markets (U.S. Department of Labor 1991; National Center on Education and the Economy 2007). They also routinely report difficulty finding skilled workers in specific occupational categories, like machinists and nurses and even welders as well as in the STEM fields. While some labor market analysts are quite dismissive of these subjective employer statements (e.g., Mishel 2010), relative wages over time have grown most strongly in the occupations and sectors where such demand has been hardest to meet (Holzer and Lerman 2007; Uchitelle 2009). The performance of cognitive tasks has also apparently grown quite high in a wide variety of job categories (Autor and Handel 2009), with relative wage trends once again indicating the occupations where this has occurred most strongly.¹¹

¹⁰The claim that the middle of the job market is largely disappearing has been made by Autor (2010), while Holzer (2010) argues that this trend is largely limited to unskilled production and clerical jobs.

¹¹Handel (2007) argues that, based on his surveys of worker task performance, that there is little evidence that employers have difficulty finding skilled employees in most jobs. But the evidence by Holzer and Lerman (op. cit.) of higher wage and employment growth in particular sectors, at least before the Great Recession, suggests tightness in some sectors, if not economy-wide.

Implications for Public Policy

If the failure of education and training in the U.S. to keep pace with skill demand among employers reflects market failures of some sort, then certain public policy interventions might be appropriate as remedies. Of course, before recommending any such policies, program and policy evaluations should give us a strong sense of which policies are cost-effective. Our ability to replicate and scale the “success” stories, and to sustain them over time, should be clear as well.

Since the evidence cited above suggests that skill mismatches persist at many levels of both education and training, policy responses at many levels are appropriate. In general, the program evaluation literature supports the notion that education and training that is targeted to growing economic sectors and linked directly to work experience in such sectors can be quite successful at improving worker outcomes. Here are some policy implications that follow from these studies:

- High-quality versions of career and technical education, such as the Career Academies and apprenticeships, deserve more public support (Kemple 2008; Lerman 2010). How CTE should evolve in an era of rising academic standards and growing importance of postsecondary education deserves more thought and debate (Symonds et al., 2008; Hoffmann 2011). Certificates and AA degrees in high-demand fields also generate strong market rewards for those who earn them and are worthwhile investments for some students (Carnevale et al. 2012; Marcotte 2005).
- Some important local programs (like I-BEST in Washington State and the GED Bridge Program in New York) show that the quality of basic skills remediation at community colleges is higher when such remediation is integrated with actual job training or with information about jobs and careers, which provide more context about the usefulness of these skills.¹²
- Completion rates among students at 2-year and 4-year colleges, as well as student enrollments in high-demand fields of study, might also be raised through the provision of more career counseling on campuses (and in One Stop offices), along with better information about labor markets based on newly available administrative data on employment growth and job vacancies (Furchtgott-Roth et al. 2009). Creating stronger incentives for these colleges to expand teaching capacity and improve instruction quality in high-demand fields is also worth exploring, though badly designed performance measures can sometimes lead to unanticipated problems (like “creaming” of admissions from the applicant pools or lower graduation standards).¹³
- *Sectoral* training models, in which intermediaries work actively with employers and training providers, while targeting particular economic sectors, have generated strong earnings improvements for disadvantaged adults and youth (Maguire et al. 2010; Roder and Elliott 2011; Edelman et al. 2011). Many states have tried to build sectoral systems, with ongoing partnerships between industry associations, training providers and

¹²See Zeidenberg et al. (2010) for evidence on I-BEST and MDRC (2012) for discussions of the GED Bridge program.

¹³Other potential policy interventions to raise completion rates are reviewed in Holzer and Nightingale (2009) and Haskins et al. (2009). These include better financial aid (perhaps conditional on student performance) and a range of supportive services for students, and also better provision of information and high-quality education at the high school level.

government, though their success in doing so is not yet clear. Other sectoral efforts are also being developed, such as the Right Skills Now for Transitioning Veterans project (in which GE and the Manufacturing Institute are creating an online system for matching veterans' credentials with employer skill needs, as well as an accelerated training program for veterans to get customized skills training for employment with specific manufacturing companies). But we do not yet know the extent to which earnings gains from sectoral training persist over long periods of time, especially when workers change jobs or sectors and when labor demand shifts across fields. Such training should therefore provide a good mix of general as well as specific occupational skills.

- State-level programs financing incumbent-worker training by employers appear to be cost-effective, even though rigorous studies of them are limited in number (Hollenbeck 2008). Enabling more employers to interact with the public education and workforce system in meeting their skill needs seems worthwhile, though the skepticism that employers mostly have about these public systems would need to be better understood and addressed.
- Greater public support for efforts to train more Americans in the STEM fields, and to improve the quality of STEM education in the K–12 years, appears warranted.

These policies would certainly not alleviate all sources of skills mismatch in the U.S., such as those that begin early in life and result in achievement gaps between racial and income groups that impede their later attainment of high-quality career education or higher education credentials.¹⁴ They also do not include the full range of labor market policies that might be needed to improve the employment outcomes of millions of disadvantaged and displaced workers in the U.S., and the huge numbers of such workers who have recently experienced (and are likely scarred by) long spells of unemployment.¹⁵

But, from the point of view of skills mismatch in the labor market, the policies listed above are good places to start.

¹⁴See Reardon (2011) for recent evidence that achievement gaps between high-income and other Americans are actually growing over time.

¹⁵Policies to aid workers who will earn low wages under any circumstances might include expansions of supports for low-wage Americans like the Earned Income Tax Credit (Edelman et al. 2009); and efforts to assist or incent American employers when they provide high-performance work places. The situation of the long-term unemployed and policy approaches to deal with them were recently summarized by Rampell (2012).

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Figure 1 Unemployment Rate and Job Vacancy Rates: The Beveridge Curve

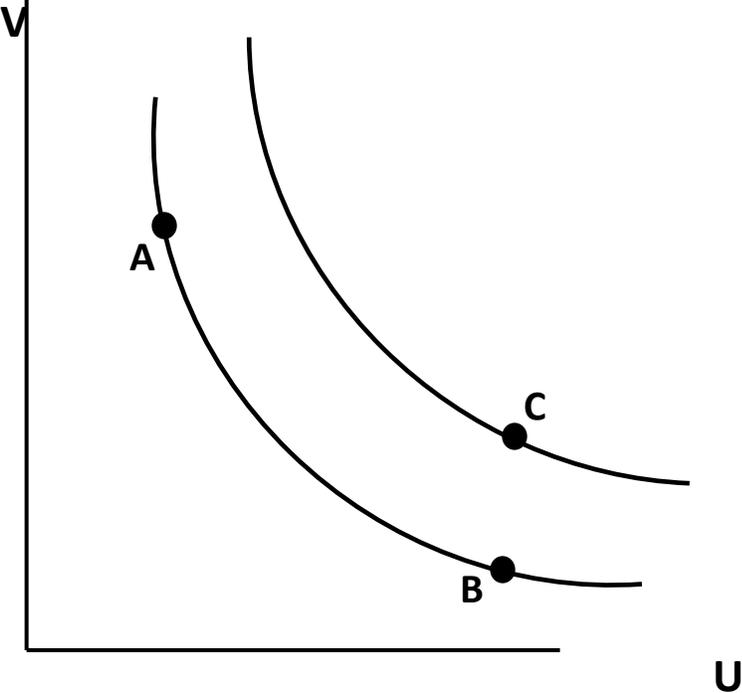
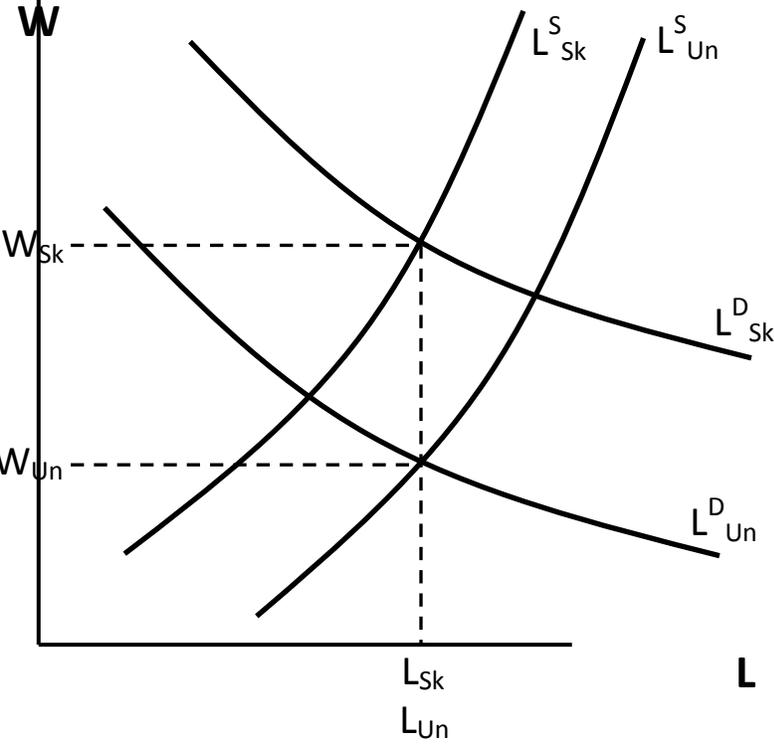


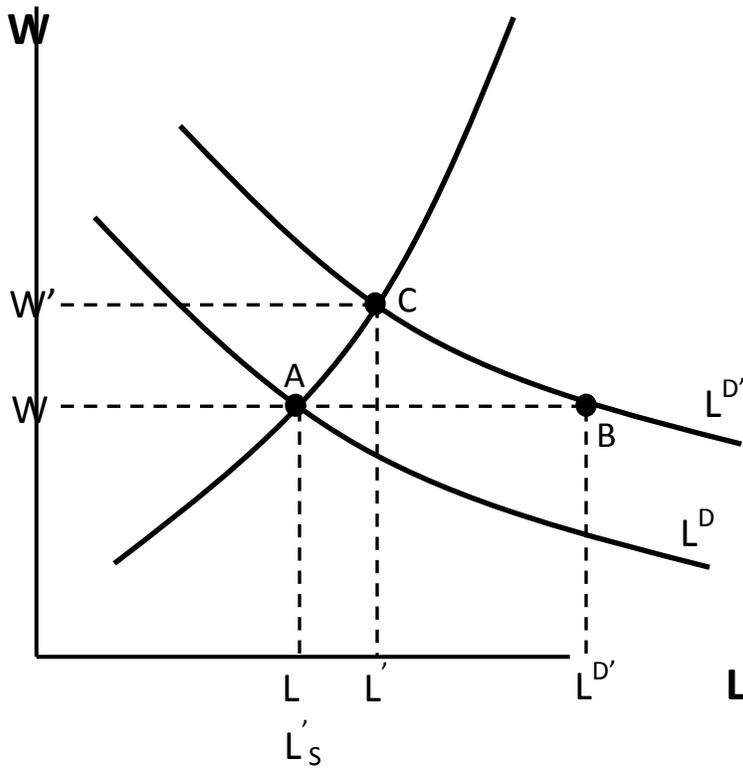
Figure 2 Labor Demand and Supply for Skilled and Unskilled Workers



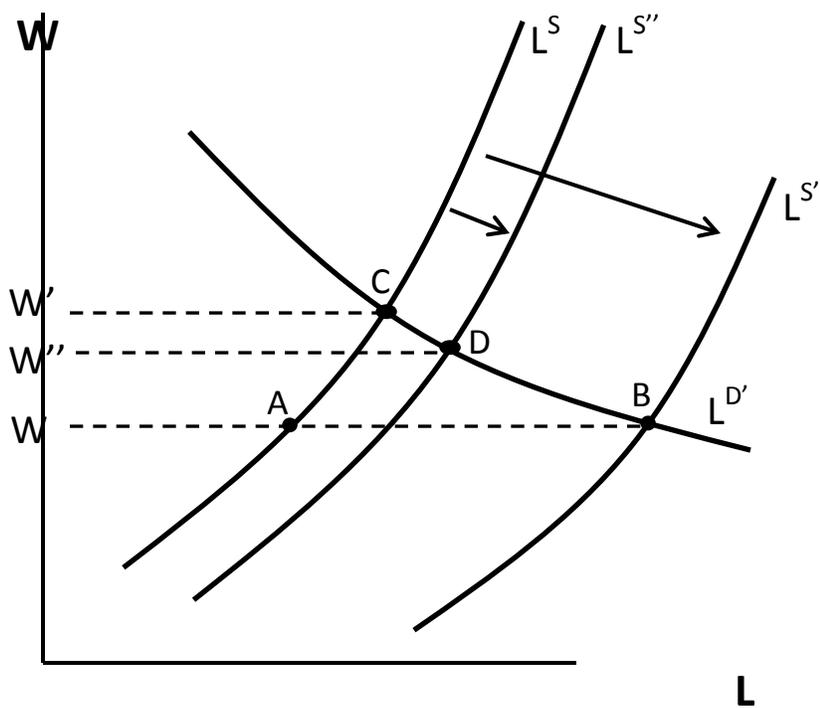
Note: W and L denote equilibrium wage rates and employment levels; Sk and Un represent “skilled” and “unskilled” workers.

Figure 3
Labor Demand Shifts and Induced Labor Supply Shifts

A. Immediate and Short-Run Effects of Demand Shift



B. Long-Run Responses of Labor Supply to Demand Shift



They need skills that the labor market will continue to demand. At the same time, to be able to choose a career path, and in order to fully unlock their potential, people must take responsibility for their own professional development. For every potential employee, the government should ensure equal and open access to development and employment opportunities.Â The Skills Mismatch and the Education System. The transition to a knowledge economy demands a workforce with highly developed digital skills, as well as, for example, complex-problem-solving ability, adaptability, and communications know-how.Â This means creating conditions that allow workers to choose where and how to deploy their time and skills, as well as where to focus their training and development.