Special Report

April 19, 2011

TD Economics
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HIGHLIGHTS

- For the first time in history, middle-skilled jobs do not reflect the majority of American workers
- Taking their place is a growing army of low and high-skilled jobs
- Technology runs into a natural barrier in replacing low and high-skilled jobs
- The relative scarcity and value of high-skilled workers results in higher and faster wage increases. On average, college graduates make 1.95 times that of high-school graduates
- The Northeast states have a competitive advantage in attracting high-skilled workers, while the Piedmont states are playing "catch-up"
- A number of states are showing lopsided, low-skilled, polarized job markets, in spite of attempts to move up the skills distribution curve
- Closing the skills gap with the northeast may be unattainable. And, those states that do not develop sufficient depth to industry clusters and fail to continue making investments in human capital will be vulnerable to deeper downturns
- However, an economy can still thrive with less dependence on high-skill industries, provided that industry clusters have depth and remain innovative

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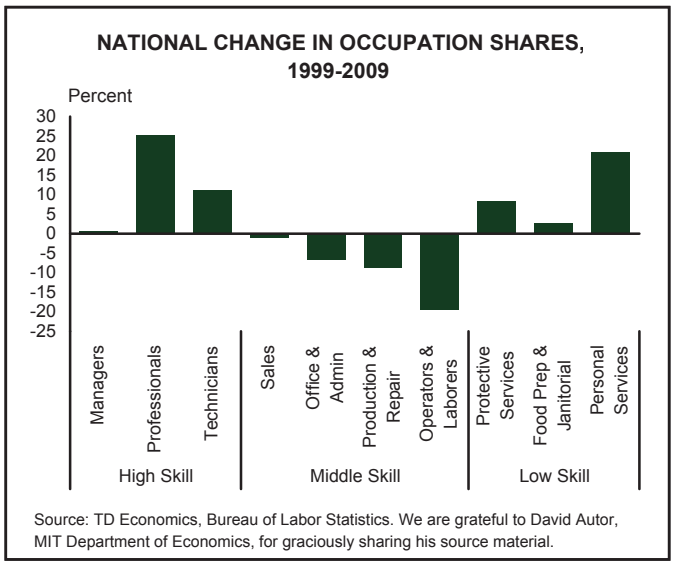
CAUGHT IN THE MIDDLE: THE POLARIZATION OF SKILLS IN THE U.S. LABOR MARKET

Technological progress has made our lives easier in so many ways, from being able to connect and communicate with people all over the world to buying groceries without ever leaving the house. However, technological progress is responsible for fundamental shifts in labor demand over the past quarter century that have favored mainly two types of workers. At one end of the spectrum, employers have sharply increased their demand for highly educated, skilled labor. At the other end of the spectrum, growth in low-skilled, less educated workers has thrived as well. Occupying the unenviable space in between the two is middle-skilled, middle-paid jobs – everything from factory workers to administrative assistants – which have contracted dramatically. The trend is termed the "polarization" of the labor market, where job growth is occurring only at the polar ends of the skills curve. Although we've recently seen a resurgence in middle-skilled manufacturing jobs in this recovery, this does not mark a reversal of the polarization trend. In fact, the polarization of job opportunities is a trend that is not going to go out of style anytime soon.



Source: TD Economics, Bureau of Labor Statistics. We are grateful to David Autor, MIT Department of Economics, for graciously sharing his source material.

A number of states have developed a competitive edge in attracting skilled, highly educated labor – particularly Massachusetts, New Jersey, New York, and Connecticut. By extension, these states tend to see productivity growth driven by innovation and creativity, which has lifted incomes and wealth in the region. However, the changing reality of the labor market has left some states playing catch-up. This is especially true of states with expansive middle-skilled manufacturing bases, where jobs have been particularly hard hit, such as in North and South Carolina. While both states are increasingly incorporating high-skilled workers into their economies, they face a greater challenge in transitioning displaced middle-skilled workers. States that do not move workers up the skills curve are at greater risk of having economies snared by higher structural unemployment and lower incomes, as well as being more vulnerable to the swings of future business cycles.

The Great Hollow

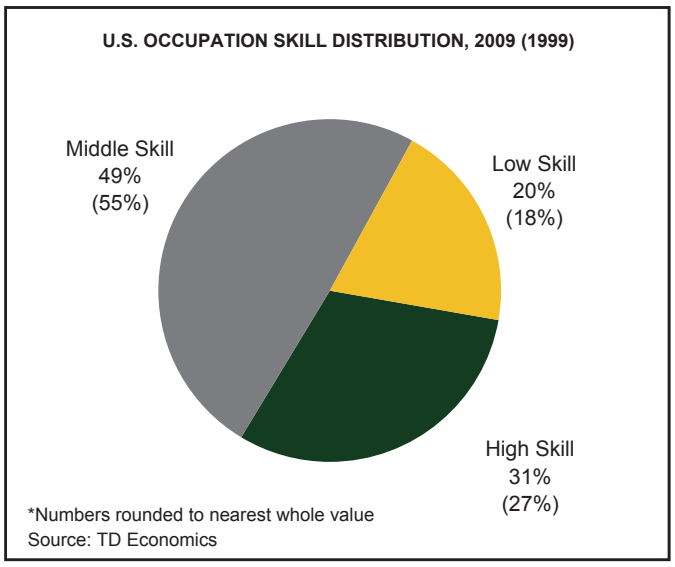
For the first time in history, middle-skilled jobs do not reflect the majority of

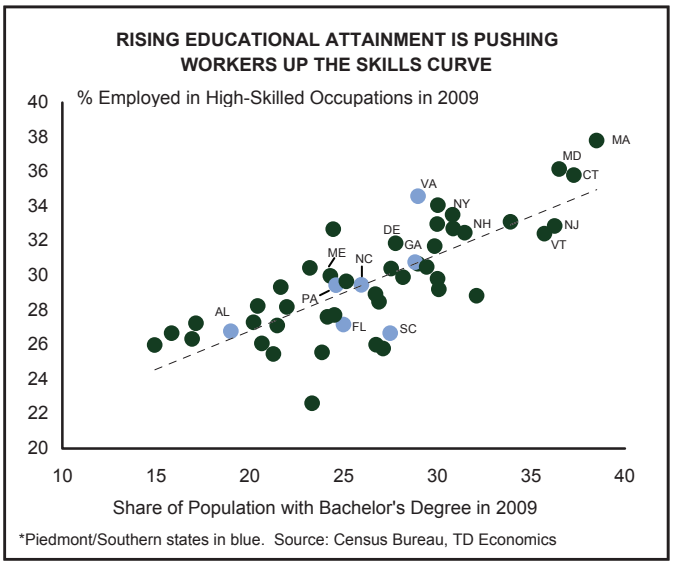
American workers. Workers in these occupations require some level of formal education, usually beyond high school, but typically lack a four-year college degree. This makes middle-skilled jobs neither the highest educated, nor highest paid. Looking at the composition of job growth over the 1999-2009 period, the share of these jobs in the workplace shrunk by over 5 percentage points.

The dwindling presence of middle-skilled workers is due to the fact that many of their on-the-job tasks follow precise, well understood procedures – such as bookkeeping, clerical work, or repetitive production tasks.[1] Thus, middle-skilled jobs are highly susceptible to computer automation or to being outsourced to low-wage locations. Their displacement has accelerated over the past decade as the quality and cost of computer and communication technologies have improved.

The squeezing of middle-skilled workers from the job market is not a uniquely American phenomenon. It is widespread globally, but particularly evident among advanced economies. Indeed, one study looked at 16 European countries and found the same forces were at play.[2]

As more middle-skilled jobs are squeezed from the workplace, the dominant perception is that they are being replaced by a growing army of low quality, and likewise, low-skilled positions. However, the data show otherwise. While there definitely has been an increase in demand for low-skilled workers, it has lagged that of high-skilled workers. In 2009, 20% of American workers were employed in low-skilled occupations, reflecting a 2 percentage point increase from a decade ago. However, high-skilled workers, who make up nearly one-third of the workforce, saw a 4 percentage point rise over the same period. The underperformance of demand for low-skilled jobs relative to high-skilled jobs is consistent with statistics that show rising educational attainment levels is pushing workers up, rather than down, the skill distribution curve. And, in case you're wondering, when we looked at a subset of data specific to the recent recessionary period, we found that demand for high-skilled workers had intensified.

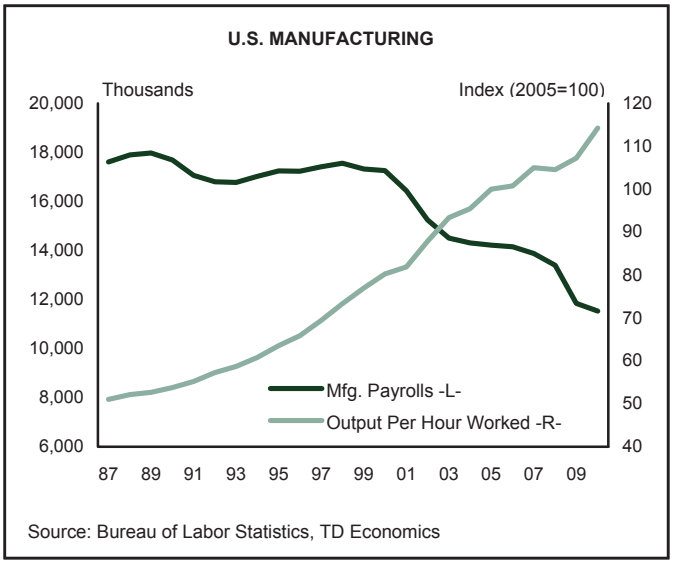




The highs and lows of future job demand

Polarization in the job market is likely to persist. Of the 15 million new jobs that the U.S. Bureau of Labor Statistics forecasts will be created between 2008 and 2018, roughly 45% will be in high-skilled occupations, while another 27% will be in low-skilled occupations.[3] The two top jobs for growth are projected to be biomedical engineers and network systems and data communications analysts, both of which require a minimum of a bachelor's degree. In fact, of the top 20 fastest growing occupations through 2018, 9 require a minimum of a bachelor's degree and 5 require no formal education at all.[4] In other words, the majority are not medium-skilled jobs.

By extension, manufacturing jobs are expected to contract by 9% (or 1.2 million positions) by 2018. As technological advances propel productivity gains and automation, alongside ever-present international competition, the greatest job losses will come in production occupations that are easily automated or outsourced. However, a few areas will see an expansion in job demand, in particular pharmaceutical and medicine products. The success of these industries is closely tied to the demand for healthcare, which will only increase over the coming decades. Even so, these "growth manufacturing" industries are estimated to generate just 17,600 positions through 2018 – a drop in the bucket rela-



tive to the large scale losses elsewhere.

In addition to hiring fewer workers, manufacturing firms are hiring more skilled workers – a double-blow to the middle-skilled production laborer. This is because manufacutring firms today incorporate more high-tech machines into their production processes. These machines often require highly-trained operators with advanced math and computer skills.

And, we must remember that middle-skilled occupations encompass more than just manufacturing. Traditional "white collar" office jobs like sales and administrative positions – all middle-skilled – have also fallen victim to technological advancement. Between 1999 and 2009, the nation's share of white collar jobs declined 4.5% – though the decline was overshadowed by a much greater 15.3% drop in production jobs over the same period.

Low-skilled jobs have a life of their own

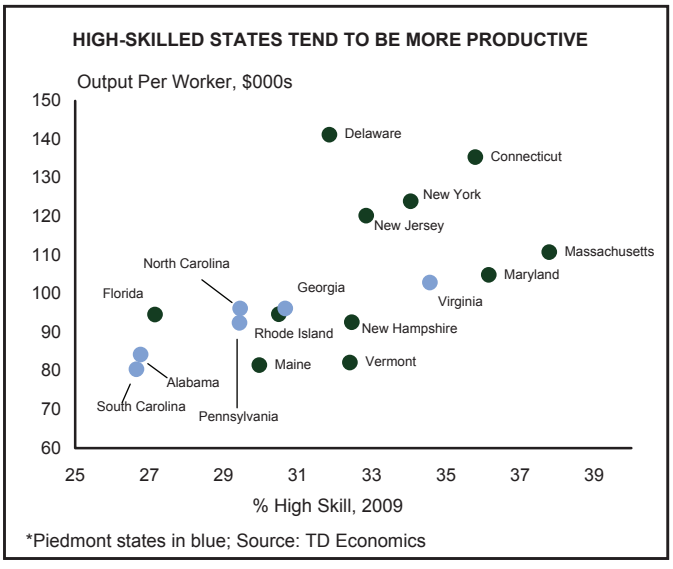
Unlike middle-skilled occupations, technology runs into a challenge in replacing low-skilled jobs. Low-skilled workers generally have little formal education and are employed in manual tasks that require face-to-face interactions and adaptability to situations.[5] Examples include janitors, home health aides, and security personnel. Technology may make a person more efficient at their job, but a person is still needed to clean a house, cut your hair, take care of a child, or bring food to an elderly parent.

In addition, some low-skilled jobs are prone to a self-perpetuating cycle. The tourism industry offers an example where a particular state, like Florida, can have a comparative advantage due to climate or proximity to amenities. Although tourism is a multi-faceted industry with jobs that span the full skills spectrum – from resort managers to waiters – a large share of tourism jobs fall into the low-skilled category. So, even though Florida has burgeoning high-skilled clusters in aerospace engineering and medicine, tourism still dominates the state's economy. Florida employs the third largest share of low-skilled workers in the country, behind Nevada and Hawaii, two other states whose economies are largely built on providing personal services to out-of-towners. Another element behind the self-perpetuating cycle is that low-skilled jobs often co-exist with high-skilled jobs. For instance, as the marginal financial benefits of paid work rises relative to housework, both men and women are more likely to hire low-skilled domestic help to reduce their time spent on these tasks.

A future skewed to high-skilled jobs

At the other end of the spectrum, demand for high-skilled jobs is thriving for predominately three reasons. First, just like their low-skilled counterparts, technology cannot readily replace high-skilled jobs. This is because high-skilled tasks often incorporate higher-level reasoning and complex decision-making, which a computer cannot easily replicate. In fact, many of these jobs require a sophisticated degree of knowledge on the use of technology within the tasks – just ask a surgeon. Second, high-skilled workers tend to drive innovation and creativity, which helps drive overall productivity growth. Productivity growth ultimately determines how fast an economy can grow over time, impacting everything from the rate of growth in production, to personal incomes, to even tax revenues.

Finally, demand for high-skilled labor is amplified by the growing tendency of skills-intensive industries to "cluster." A cluster is a group of interconnected businesses, suppliers and service providers all operating within the same field and



within close geographic proximity to each other.[6] Industry clusters have proven effective in boosting competitiveness and economic development, especially within advanced economies where it's a mugs game to try to compete on the low-wage cost front. Clustering of high-skilled industries promotes access to shared knowledge and resources, which enhances collective productivity and innovative capacity.[7] In turn, clusters act as magnets for drawing skilled workers to a region. It is for this reason that clustering offers a unique regional competitive element that we will discuss in greater detail shortly, but for now, the finance industry in New York City offers a simple example of the effectiveness of clusters. When global demand for financial services took off in the mid-1970s, New York's expansive web of financial enterprises attracted industry activity to the city like moths to a flame. Thanks to cluster benefits, New York City has yet to cede its position as the undisputed global financial capitol, even in the midst of competition from other locales. Indeed, finance firms still prefer to settle in New York City, with its high cost-of-living and business costs, over the more economical choice of Charlotte, North Carolina – the nation's second largest, but comparatively less developed, financial hotspot.[8]

To the skilled worker go the spoils

The combined forces that are driving demand for high-skilled labor have come up against a simple economic condition. High-skilled labor is in relatively short supply. Less than 18% of Americans have a Bachelor's degree, and only 10% hold a Master's degree or higher. Given high-skilled workers' relative scarcity and high value, the end result is higher wages and faster wage increases for skilled labor than for medium and low-skilled labor. On average, college graduates make 1.95 times that of high-school graduates.[9] The benefit of higher wages is compounded by also having faster wage growth. For instance, in North Carolina, where only 26% of the adult population holds college degrees (slightly below the national average), inflation-adjusted average hourly wages paid to high-skilled workers rose nearly 13% over the last decade. By comparision, the average wage paid to medium and low-skilled workers rose by only 6% over the same period. This pattern can be more pronounced in states that have an even greater demand for skilled workers. In the Northeast, skilled wages grew by 18%, considerably faster than the 8% and 11% realized for medium and low-skilled workers, respectively.

2009 State Occupation Skill Shares and Post-Secondary Educational Attainment (%)*

	High	% chg.	Medium	% chg.	Low	% chg.	Education	% chg.
Northeast								
Connecticut	35.8	17.1	44.8	-12.6	19.2	6.7	37.3	12.8
Delaware	31.9	33.1	49.3	-15.6	18.5	7.7	27.8	10.5
Maine	30.0	7.4	48.7	-6.6	20.7	6.7	24.3	11.8
Maryland	36.2	14.2	44.4	-11.2	19.1	5.7	36.5	7.7
Massachusetts	37.8	12.0	42.6	-9.8	19.4	2.8	38.5	23.2
New Hampshire	32.5	11.9	48.5	-10.2	18.8	12.7	31.5	21.4
New Jersey	32.9	17.5	47.8	-12.8	19.1	12.5	36.3	20.7
New York	34.1	21.0	44.9	-13.3	20.8	4.9	30.0	16.8
Rhode Island	30.5	20.9	46.7	-13.7	22.7	10.2	29.4	13.3
Vermont	32.4	26.4	47.3	-14.6	19.9	6.4	35.7	24.3
Piedmont / South								
Alabama	26.8	6.8	55.0	-6.3	17.7	11.1	19.0	-8.7
Florida	27.2	7.4	50.2	-6.1	21.9	6.6	25.0	18.7
Georgia	30.7	16.7	50.7	-10.1	18.1	7.3	29.0	30.5
North Carolina	29.5	14.3	50.3	-12.2	19.8	20.1	25.9	12.6
Pennsylvania	29.4	8.7	50.6	-9.4	19.7	16.7	24.6	11.3
South Carolina	26.7	6.9	52.4	-9.3	20.4	20.6	27.5	23.0
Virginia	34.6	21.2	46.3	-12.7	18.8	3.3	29.0	-1.1

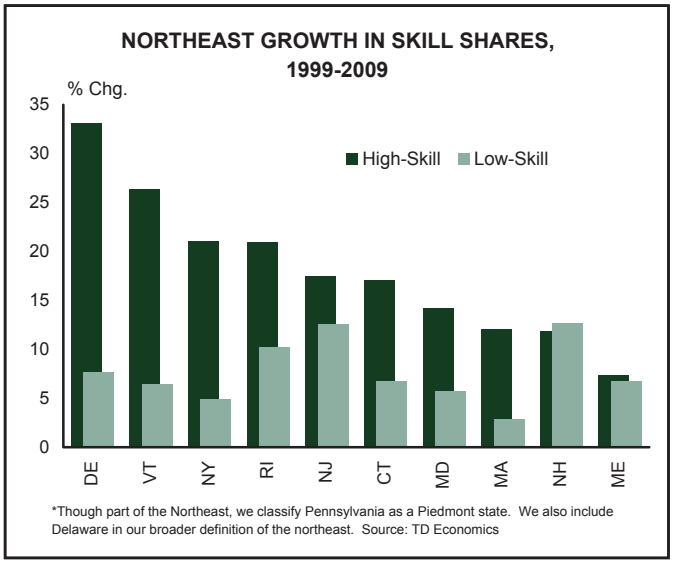
*Total non-farm, non-military employment, may not sum to 100% due to incomplete data or rounding. Education defined as proportion of adults age 25+ with a bachelor's degree or higher. % chg. from 1999 to 2009. Source: TD Economics, Bureau of Labor Statistics, Census Bureau

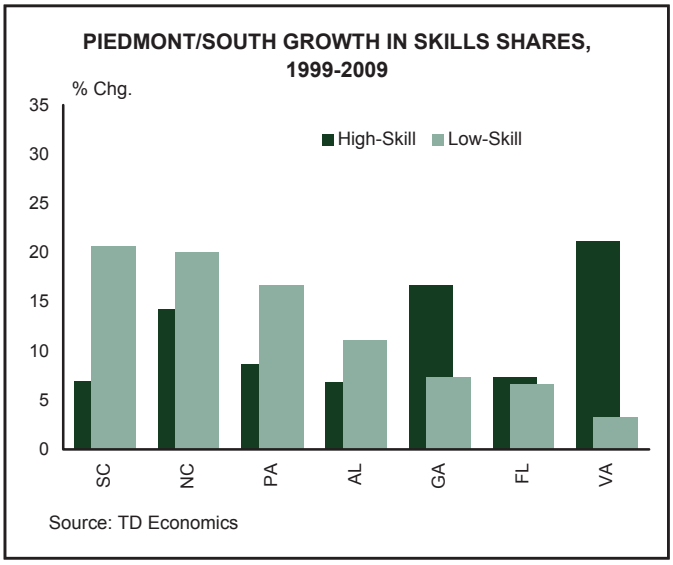
As wages rise faster for high-skilled workers, the less-skilled are gaining an ever-shrinking piece of the income growth pie. Thus, the degree to which jobs are distributed along the skills curve within a state or region becomes instrumental in driving both the short-term and long-term economic performance of that state.

The northeast is a skills magnet

To see how the benefit of high-skilled workers trickles through an economy, hop onto I-95 and drive north from Washington D.C. to Boston. This is the main artery of the Northeast Megalopolis, a densely populated 450-mile stretch of coast that forms the economic hub of the country's nine-state northeastern region. In 2009, even though the population amounted to just 18% of the American total, the region accounted for 23% of total U.S. output. Likewise, average household incomes were 13% higher than the national average.

Three key ingredients have allowed the northeast region to punch above its weight: a well-educated population; densely populated urban centers where new ideas are easily exchanged; and an abundance of innovation that comes from the region's dynamic array of diverse, but mutually interdependent, industry clusters. Perhaps no state in the region embodies all three better than Massachusetts. Thirty-six percent of the state's adult population holds a college degree, and thirty-eight percent of the state's workforce is employed in high-skilled occupations – the most of any state in the nation. Boston is home to a thriving cluster of biotech firms that have benefited immensely from their proximity to Harvard and MIT, two leading research universities. The success of these industries has had spillover effects on every-





thing from the venture capital firms that fund new research to the factories that transform this research into mass-produced realities. Healthcare, education, finance, and professional services – the main industries of Massachusetts's high-skill ecosystem – accounted for 40% of the state's output in 2009, compared to 30% for the nation as a whole.

To be clear, Massachusetts and other high-skilled leaders like Connecticut, New Jersey, and New York, didn't just move "up the skill curve" overnight; it has been a long process. However, because these states were among the first to see the de-industrialization process take hold, they benefited from a first-mover advantage in many of the high-skill industries in which they now excel. Once a state is successful in developing a diverse knowledge cluster that becomes a magnet for skilled labor, it is difficult to debunk the ecosystem. More recently, the smaller states of Vermont and Rhode Island are making this transition, as traditional bread-and-butter industrial activity is leaving in search of cheaper labor elsewhere. As a result, "knowledge" industries are filling manufacturing's void in the northeast to such a significant degree that it's actually creating lopsided polarization, with disproportionate growth in high-skilled labor relative to low-skilled.

South undergoing skills transition

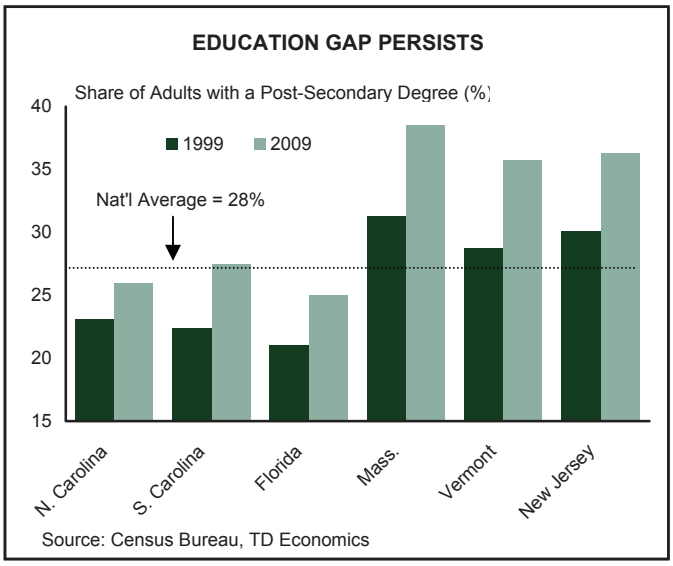
Continuing with our driving tour, turn south from Boston and back-track along I-95. Long after you've left the Northeast Megalopolis the landscape begins to shift. This is the hilly Piedmont region of North and South Carolina – the epicenter of the Appalachian manufacturing belt that stretches from Pennsylvania in the north to Georgia and Alabama in the south. Initially, the region attracted middle

and low-skilled industry away from older industrial centers in the northeast through a combination of competitive labor costs, low union penetration, and favorable tax policies.[10] However, technological progress and competition from developing economies have eroded this structural advantage.

With their traditional manufacturing base under stress, some have attempted to diversify into higher skilled service sectors. Unfortunately, this is easier said than done. College attainment rates in the Piedmont states historically have lagged the nation, and so these states have been less successful in nurturing high-skilled industries. For decades, they pursued policies that supported middle-skill payrolls by promoting labor-intensive manufacturing activity within their borders.[11] As a consequence, they find themselves playing "catch-up" with states that are already well advanced on the skills front.

North Carolina has been somewhat successful in implementing a come-from-behind strategy. The state experienced a steep drop in its share of middle-skilled jobs over the last ten years, but growth in high-skilled shares has been robust, expanding 14% since 1999 (a rate only slightly above the national average). Charlotte's burgeoning financial center is second only to New York City, and the Raleigh-Durham metropolitan area is home to a "Research Triangle" that boasts a large clustering of biotech firms, as well as other high-tech enterprises. Nonetheless, closing the skills gap with the northeast will be a challenge. Although education rates have improved in North Carolina, so too have they in many northern states. Thus, as the above graph demonstrates, even as North Carolina (and other southern states) move one step forward, the northeastern states are moving in lockstep.

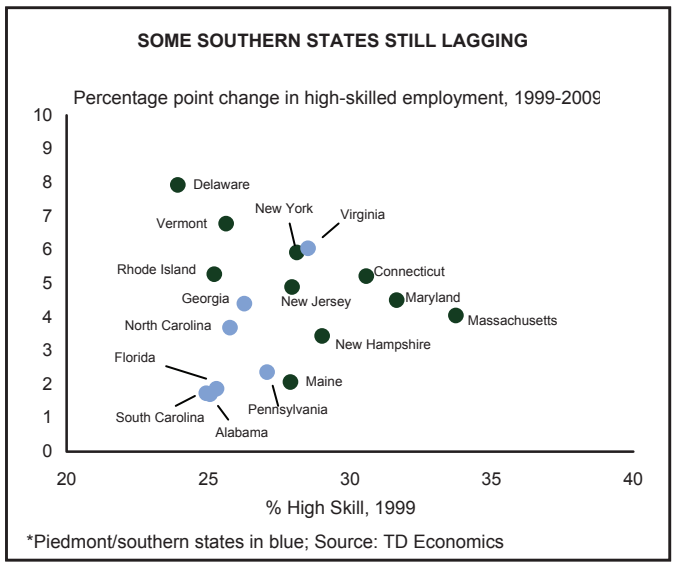
South Carolina too is having some difficulty carving out a high-skilled niche, mainly because it faces less economic pressure to do so. The state has done a better job than most of maintaining its traditional manufacturing base. This is partly due to South Carolina's relatively low unit labor costs and unionization rates that have encouraged the development of manufacturing clusters in the state. By our calculations, the average middle-skilled production worker in South Carolina earns an inflation-adjusted average hourly wage that is 20% less than in New York and Massachusetts. And, less than 5% of South Carolinians belonged to a labor union in 2010 compared with New York's 24.2% and New Jersey's 17.1%.[12] Despite this, the scaling back of middle-skilled production jobs has not been halted in the state, but these factors have maintained its comparative strength in the area.



Are you the maker of your own fate?

As we already noted, there is a first-mover advantage in a state building and retaining a well-educated and skilled population. However, while difficult, it is not impossible for a state to re-invent itself and move up the skills curve. Just because a state has developed industries that capture a disproportionate share of medium and low-skilled workers does not mean it is destined for a future of low productivity and income growth. The challenge, however, will be to encourage clustering within their industries of comparative advantage.

A leading researcher in this area is Michael Porter. He found that states that develop clusters in a few industries of strength generate higher wealth than states that are less specialized.[13] An example helps illustrate the nuance of this claim. Aerospace is an industry. But, it has an entire network of suppliers of raw materials, firms that design and create various parts, and marketers of the final product. Together, these form an aerospace manufacturing cluster. Indeed, the physical production of a plane on a factory floor is but one component of an overlapping and interdependent ecosystem of related industries. Porter argues that it is specialization in clusters, not industries, that matters most for a state's economic prosperity. But, this does not escape the fact that because manufacturing is becoming more high-skill oriented, a challenge before policymakers is to ease the transition of displaced middle-skilled workers by expanding existing job training or skills development programs. Doing so will push laid-off workers up the skills curve (rather than letting them fall down the curve). Remember, productivity is not a bad word. As workers move up the skills curve and progress is made in building out manufacturing clusters,



economic growth will accelerate. This will lead to job creation and wealth creation that cuts across all skill levels.

A transition is clearly already underway in many of the southern states. The proportion of South Carolinians with post-secondary degrees grew 23% since 1999, while in Florida and North Carolina educational attainment grew by 19% and 13%, respectively. On the surface at least, it appears that manufacturing clusters are gaining some depth in the region. Despite North Carolina's push towards high-skill industries, it still possesses a concentrated production sector. South Carolina too has made headlines in recent years for attracting a BMW plant, and more recently a Boeing assembly line in North Charleston. And, in its quest to attract high-skilled workers, lest we forget that the region boasts one key advantage over the northeast: a low cost of living. Indeed, the median home price in the South Atlantic region is 30% less than in the Northeast.

Nevertheless, closing the skills gap with the northeast will not happen overnight. And we must caution that those states and regions that do not develop sufficient depth to industry clusters and fail to continue making investments in human capital will be vulnerable to deeper downturns. The Great Recession was a strong reminder that the hardest hit jobs in economic downturns tend to be in medium and low-skilled occupations. At the height of the recession, the unemployment rate among non-college educated workers was 10.8% versus only 4.8% for workers with college degrees. Persistently higher unemployment could become entrenched in states with a higher proportion of less educated labor markets, which would further erode existing human capital and douse the flame of economic potential.

For northeast states that already enjoy a first-mover advantage on the skills front, continuing to cultivate their own set of high-skilled industry clusters is key for overcoming looming demographic challenges. The region's ageing population, together with low fertility rates and net out migration means there will be a smaller pool of workers in the future to support a growing base of retirees. Advancing productivity growth by investing in workers' skills is therefore vital for counteracting the unfavorable demographic pressures that will drag on growth in time. Luckily for these states, much of the groundwork has already been laid.

Conclusion

Polarization of the labor market is not a near-term or temporary phenomenon. The future for job growth rests with those positions that are non-routine in nature or provide value through face-to-face interaction. Rather than lamenting the decline of middle-skilled job opportunities, states should continue to encourage the formation of high-skilled clusters by fostering talent and innovation within their own borders. This will ensure they retain a competitive edge regardless of their industries of concentration. Although a number of states in the South have a lopsided, low-skilled, polarized job market, there is clear evidence that progress is being made to move up the skills distribution curve. Closing the skills gap with their northern neighbors will be no easy task, and perhaps is not even a realistic goal given the competitive edge that comes with being at the forefront of developing a particular knowledge industry to attract skilled labor. Fortunately, research shows that an economy can still thrive with a lower high-skill distribution, provided that industry clusters have depth and remain innovative.

Endnotes

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