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U.S. Manufacturing Decline and Economic Development Prospects

By Robert D. Atkinson

WHAT STATES AND LOCALITIES CAN DO

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u.s. manufacturing

DECLINE AND ECONOMIC DEVELOPMENT PROSPECTS

By Robert D. Atkinson

In the 2000s, U.S. manufacturing suffered its worst performance in American history. Not only did we lose 5.7 million manufacturing jobs, but the loss as a share of total manufacturing jobs (33 percent) exceeded the rate of loss in the Great Depression.[1] This, more than any other reason, is why the U.S. economy experienced no net new job creation in the 2000s and why so many state and regional economies struggled and continue to struggle. Reviving manufacturing, and more broadly traded sector (industries that sell outside the U.S.), competitiveness is a key task for local, state, and national economic development leaders.

WHY MANUFACTURING MATTERS?

Supporters of manufacturing offer many valid arguments for why manufacturing jobs are more critical than jobs in most other sectors. These include: manufacturing jobs pay more;[2] manufacturing is a source of good jobs for non-college-educated workers;[3] and manufacturing is the key driver of innovation.

But while these are all true, the central reason why manufacturing matters is that it is a key enabler for the nation, for states, and for many communities of traded sector strength. It is impossible to have a vibrant economy without a competitive traded sector.[4] And manufacturing is still the largest traded sector and will be for some time.

Traded sector jobs are important because they have high employment multipliers. This is the primary reason why all states focus their economic development efforts on traded industries like manufacturing and software, and not on sectors like barbershops and grocery stores. If a barbershop closes, another will take its place to serve local demand. But if a manufacturer closes, another one may take its place, but probably not in the same city or state or increasingly even country. Every lost manufacturing job means the loss of around 2.3 other jobs in the U.S. economy.[5] As such, the anemic overall job performance in the last decade was directly related to the loss of 5.7 million manufacturing jobs.

MANUFACTURING JOB LOSSES

The most obvious sign of U.S. manufacturing decline has been the loss of jobs. To be sure, manufacturing job loss is not new, but prior to 2000 the rate was relatively modest. From 2000 to 2011 the rate of loss dramatically accelerated, with manufacturing jobs shrinking at a rate nearly six times faster (3.1 percent per year) than the rate in the prior two decades. Manufacturing lost 5.5 million jobs for a decline of 31.7 percent. (Figures 1 and 2) The economy lost 13 times as many manufacturing jobs between 2000 and 2010 than between 1990 and 2000.

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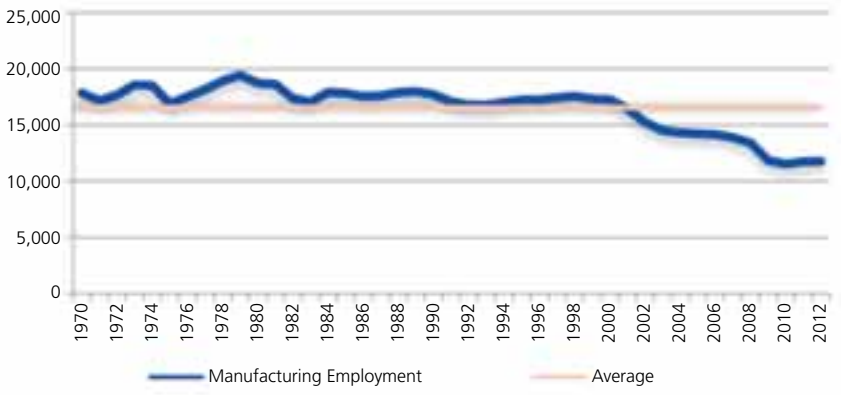
Figure 1: U.S. Manufacturing Employment (thousands), 1949-2011[6]



WHAT STATES AND LOCALITIES CAN DO

In the 2000s, U.S. manufacturing suffered its worst performance in American history, losing 5.7 million jobs. This, more than any other reason, is why the U.S. economy experienced no net new job creation in the 2000s and why so many state and regional economies struggled and continue to struggle. Reviving manufacturing, and more broadly traded sector, competitiveness is a key task for local, state, and national economic development leaders. This article describes a number of steps states and regions can take, but unless the federal government institutes a strong national manufacturing strategy even the best of efforts by states and local governments will fall short.

The economy's anemic employment record of the 2000s is due in large part to the loss of manufacturing jobs. As Figure 2 shows, total job growth was robust in the 1980s and 1990s while manufacturing jobs declined only modestly. But there was no net job growth in the 2000s, principally because manufacturing jobs fell so sharply. When an economy loses an average of 17 manufacturing establishments and 1,276 manufacturing jobs a day and then another approximately 2,400 jobs because of the multiplier effect (for a total loss of approximately 3,676 a day; for the average state 75 jobs a day), it generates a stiff headwind for the American jobs machine to overcome.[7]

Figure 2: Total Net Job Percent Change and Manufacturing Job Percent Change[8]

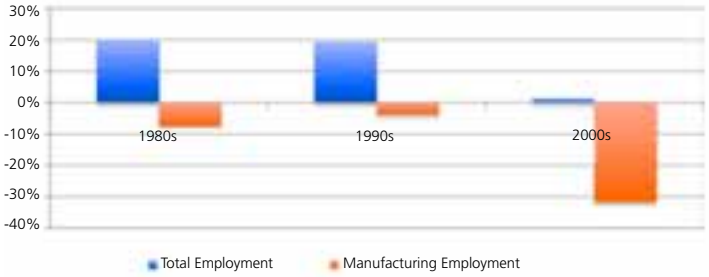
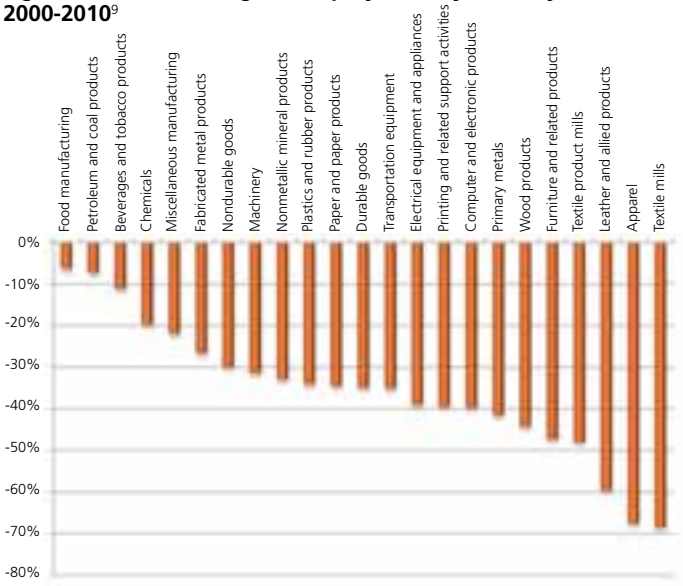


Figure 3: Percent Change in Employment by Industry, 2000-2010[9]



While all manufacturing industries saw job losses between 2000 and 2010, this change was not distributed evenly across industries. Low-value-added industries most affected by globalization saw the steepest losses, with almost seven in 10 jobs in apparel disappearing, six in 10 in textiles, and almost five in 10 in furniture. (See Figure 3) Two industries least impacted by globalization – food products and petroleum refining – experienced the lowest job loss: less than 10 percent each.

One reason some have argued that all is well with U.S. manufacturing is that they persist in viewing manufacturing as a "rust belt" industry where the losses are largely confined to a few states whose economies are concentrated in declining industries. To be sure, "rust belt" states saw significant losses. The deterioration of the automobile industry led to a loss of close to half of Michigan's manufacturing jobs – Detroit alone lost 150,000 auto industry jobs between 2000 and 2008.[10] But manufacturing loss has been a significant feature of almost every state. North Carolina ranks second in the loss of manufacturing jobs between 2000 and 2010.

Only two states – Alaska and North Dakota – saw less than double-digit declines in manufacturing employment (with only Alaska creating jobs), but these two states employ less than 20,000 manufacturing workers combined.[11] Even the third-best state in terms of manufacturing employment performance, Nevada, saw a loss of 11 percent of manufacturing jobs. (See Figure 4, Tables 1 and 2)

Figure 4: Percentage Loss in Manufacturing Jobs, 2000-2010[12]

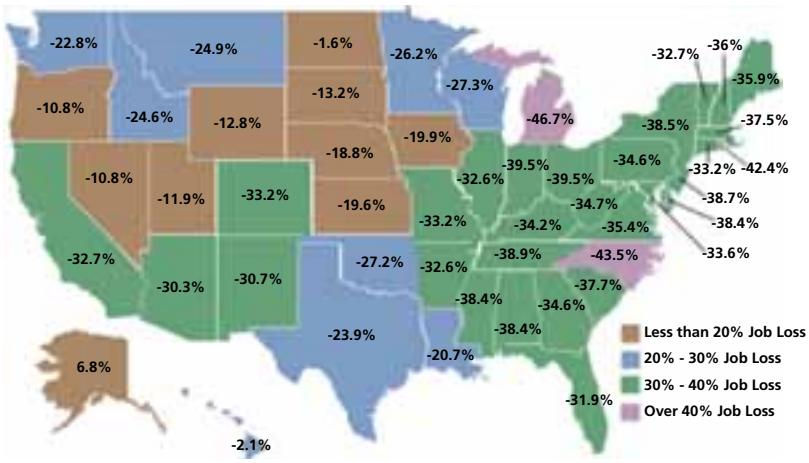


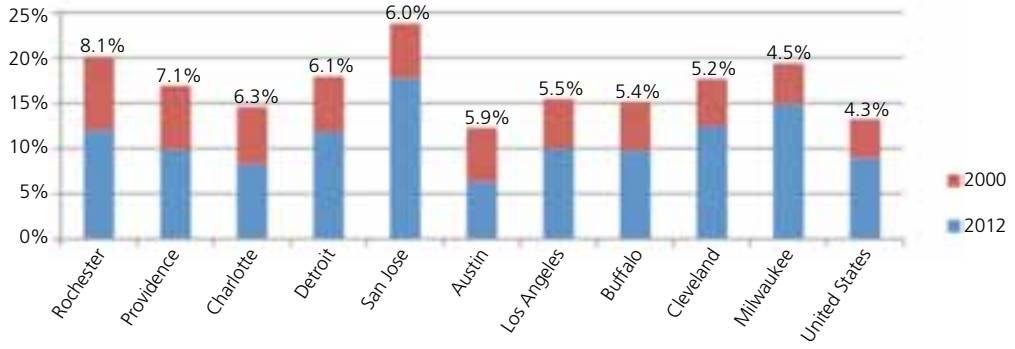
Table 1: Top Ten States With the Largest Share of Manufacturing Job Loss, 2000-2010[13]

Rank	State	Change
1	Michigan	-46.7%
2	North Carolina	-43.5%
3	Rhode Island	-42.4%
4	Ohio	-39.5%
5	Tennessee	-38.9%
6	New Jersey	-38.7%
7	New York	-38.5%
8	Delaware	-38.4%
9	Mississippi	-38.4%
10	South Carolina	-37.7%

Table 2: Top Ten States With Manufacturing Job Gain or Least Job Loss, 2000-2010[14]

Rank	State	Change
1	Alaska	6.8%
2	North Dakota	-1.6%
3	Nevada	-10.8%
4	Utah	-11.9%
5	Wyoming	-12.8%
6	South Dakota	-13.2%
7	Nebraska	-18.8%
8	Kansas	-19.6%
9	Iowa	-19.9%
10	Louisiana	-20.7%

Figure 5: Selected Metropolitan Areas Percent of Workforce in Manufacturing and Percentage Point Declines, January 2000-January 2012[15]



We see the same dynamic at the metropolitan level. It may not be surprising that "rust belt" metros such as Buffalo, Cleveland, and Detroit have lost manufacturing jobs (so much so that fewer than 12 percent of workers are now employed in manufacturing in those areas), but so have so-called "new economy" metros such as Austin, Texas; Los Angeles; and San Jose. (See Figure 5)

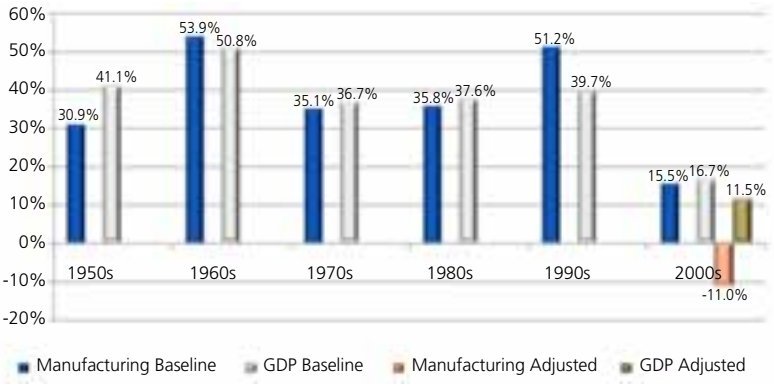
PRODUCTIVITY GROWTH DOES *NOT* EXPLAIN U.S. MANUFACTURING JOB LOSS

Is losing 1/3 of U.S. manufacturing jobs a problem? Unfortunately many economists at the national level put on rose colored glasses and argue it is not. For example, William Strauss, a senior economist at the Federal Reserve Bank of Chicago, stated, "Automation has enabled U.S. manufacturers to produce significantly more with fewer workers than they did in previous decades."[16] In this narrative, all is well. Rapid productivity growth, not output loss, is driving manufacturing job losses. Far from a cause for concern, the dramatic loss in manufacturing jobs should be seen as a key metric of success.[17] Strauss is not alone in his unrealistically optimistic view. Indeed, it has long been the Washington consensus that steep declines in factory jobs are symptoms of our industrial good health.

Lamentably, the state of American manufacturing – and by extension the American economy – has been seriously misdiagnosed. In fact, the idea that "all is well" is faulty on two counts. First, even when relying on official U.S. government data, it is clear that manufacturing output growth has lagged this decade, particularly in a number of key sectors. Second, and more importantly, it is increasingly clear that the U.S. government's official statistics significantly overstate real manufacturing output and productivity growth. The most serious bias relates to the computers and electronics industry (NAICS 334) – its output is vastly overstated. When the Information Technology and Innovation Foundation corrected for these statistical biases, we found that the base of U.S. manufacturing has eroded faster over the past decade than at any time since WWII. In other words, the massive loss of jobs is not due to superior productivity alone. It is also caused by loss of output, which stems from a loss of international competitiveness among U.S. manufacturing establishments.

Once the official output figures are adjusted and aggregated, the recent performance of U.S. manufacturing looks very different from the official figures.[18] As Figure 6 shows, manufacturing real value added actually fell by 11.0 percent from 2000 to 2010, which, in turn, implies that GDP actually grew by only 11.5 percent over the period, and not the officially reported 16.7 percent GDP growth.[19] (Meanwhile, the output of the rest of the private business sector, excluding manufacturing, grew by 16.1 percent.)

Figure 6: Percentage Change in Real Value Added by Decade[20]



We see the same loss of output at the state level. In terms of change in real value added for non-durable goods (e.g., chemicals, food, printing, plastics), 32 states, accounting for 79 percent of national non-durables output, saw losses in output from 2000 to 2010. And of the 18 that saw increases, when change in real non-durables minus petroleum and coal products is measured, 10 additional states, accounting for another 12 percent of U.S. output, saw absolute declines in non-durable output.[21] For example, while non-durable production increased by 220 percent in Wyoming, when petroleum and coal products are removed, it turns out the state suffered a massive 76 percent decline in non-durables output.

Durable goods presents a similar picture. There were just 10 states that produced less real durable goods output in 2010 than in 2000.[22] However, when we assume that NAICS 334 grew 28 percent in each state during this period, rather than the 477 percent that BEA estimates, the picture is quite different.Then 34 states representing 76 percent of U.S. durable goods output saw losses in output.[23]

WHAT MANUFACTURING REVIVAL?

Despite the unprecedented manufacturing job losses, many are now talking about a manufacturing revival. Floyd Norris of the *New York Times* wrote, "When the Labor Department employment numbers are released on Friday, it is expected that manufacturing companies will have added jobs in two consecutive years. Until last year, there has not been a single year when manufacturing employment rose since 1997."[24] The jobs data seem to back up Norris's claim. From January 2010 to May 2012, 495,000 manufacturing jobs were added, contributing to 13 percent of total job gains, even though manufacturing accounts for less than 10 percent of U.S. jobs.[25]

Two straight years of growth may then be interpreted as a manufacturing panacea, where not-so-past worries are firmly dispelled. When measured in terms of job growth since the end of the recession, it is true that manufacturing has added jobs. But this performance is vastly weaker than most post-war recoveries. Manufacturing jobs were up just 0.7 percent in the 30 months since the end of the recession. By contrast, manufacturing added between 6.8 and 9.0 percent in the 30 months succeeding the recessions in 1969, 1974, and the early 1980s.

Norris and others overlook the fact that, at 14.7 percent, the loss of manufacturing jobs in this recession was the largest since the Great Depression. Compare this to the 1990-1991 recession, when manufacturing lost only 3.2 percent of its jobs. Moreover, for every 12 manufacturing jobs lost during the Great Recession, only one had returned by February of 2012.[26]

At the rate of growth in manufacturing jobs in 2011, it would take until at least 2020 for employment to return to where the economy was in terms of manufacturing jobs at the end of 2007.[27] In reality, U.S. manufacturing has been in a state of structural decline due to loss of U.S. competitiveness, not temporary decline based on the business cycle.

The optimism stemming from the restoration of some lost manufacturing jobs is bolstered by reports like a recent one from Boston Consulting Group (BCG) that claimed that, "within the next five years, the United States

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Rob Atkinson testifying before the House Committee on Science and Technology on the role the U.S. government can play in restoring U.S. innovation leadership.

is expected to experience a manufacturing renaissance as the wage gap with China shrinks and certain U.S. states become some of the cheapest locations for manufacturing in the developed world."[28] In other words, America has turned the corner and is now back in the game. Never mind that BCG came to the exact opposite conclusion a few years earlier, stating, "We maintain, in contrast, that the cost gap [between China and the United States] not only is unlikely to close within the next 20 years, but in some cases may actually increase."[29]

The fact is that the cost differential with China is still quite high, and as China opens up its interior regions to development, it is tapping into new, large pools of low-wage labor. Thus, the rate at which the wage differential is closing is still very slow. In any case, is it really wise to suggest that America not bother to act to revitalize manufacturing because it *might* come back on its own?

WHAT TO DO

Without a strong recovery of U.S. manufacturing competitiveness, it will be difficult for the U.S. economy, and state and local economies, to achieve the kinds of robust growth rates they enjoyed in decades like the 1990s. What can state and local economic developers do? Clearly they can and are doing things within their own regions. But the reality is that unless the federal government institutes a strong national manufacturing strategy even the best of efforts by states and local governments will fall short

ITIF has argued that the federal government needs to implement what we call the 4 Ts of manufacturing policy: tax, trade, tech, and talent policy.

Tax: Effective combined state/federal tax rates on manufacturers in the U.S. are among the highest in the world. We need to expand tax incentives for manufacturers to invest in America in things like R&D, new capital equipment, and worker training.

Trade: Our trade system increasingly doesn't work because more and more nations, most prominently China, are engaged in rampant mercantilist practices. We

have to significantly step up the fight to ensure that our manufacturers compete on a level playing field.

Tech: Compared to other nations we invest very little in programs to help manufacturers be more competitive. Funding for our program to help small and mid-sized manufacturers be more competitive (NIST's Manufacturing Extension Partnership program) is much lower than many competitor countries. We need to double MEP funding (from its current level of around $128 million annually) and also enact the administration's proposal to create a National Network of Manufacturing Institutes (NNMI) which would focus on particular technologies and pre-competitive joint research of use to manufacturers.

Talent: We need to do a much better job of ensuring that manufacturers have the talent they need, not just engineers but also skilled manufacturing technicians.

So the single most important thing state and local economic developers – whether in the public or private sectors – can do is to encourage their local members of Congress to support a robust national manufacturing policy based on the 4 Ts. Toward that end, ITIF took the lead in bringing over 20 groups together to endorse a *Charter for the Revitalization of American Manufacturing* based on the 4 Ts.

Beyond federal policies to support traded sector competitiveness, there are a number of policies states and cities can implement to bolster manufacturing competitiveness. These include:

Fully fund the Manufacturing Extension Partnership at the state level. Perhaps the best manufacturing policy states can implement is to fully fund their Manufacturing Extension Partnership centers that work with small manufacturers to become more productive and innovative. The MEP programs have had considerable impact on boosting the productivity, competitiveness, and innovation potential of America's SME manufacturers, and states should fully avail themselves of the opportunity to help their SMEs engage MEP services.

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Expand manufacturing technology programs at community colleges. States and regions should significantly expand manufacturing technology programs at community colleges. For example, in 2011 Connecticut's legislature provided $20 million in bonds to establish or enhance manufacturing technology programs at three community colleges.[30] This was part of a broader jobs bill (HB 6801) that authorized $626 million in bonds to support high-tech entrepreneurship, workforce development, and incentivize manufacturers in Connecticut.

Implement innovation vouchers. Iowa has had a voucher-like program in place for the past ten years. The Iowa Industrial Incentives Act designated funds for Iowa manufacturing firms to solve small problems (generally providing about $25,000 to $30,000, with a 1:1 in-kind match), with most of the work being done through the College of Engineering at Iowa State University.

Eliminate job creation tax credits and instead use those funds to implement investment tax credits. Approximately 22 states have job creation tax credits, but evaluations of these programs suggest that they do little to induce firms to hire more workers. Firms hire more workers if they believe that the demand for their products or services is going to increase enough to create work for the added worker, not if the government temporarily offsets the cost of a new employee by a small percentage.[31] States would do better to allocate these "tax expenditures" toward investment tax credits for companies' expenditures on capital equipment.

Align state R&D tax credits with the federal ASC R&D tax credit. Approximately 38 states have R&D tax credits.[32] Approximately half of these states link to the federal R&D credit, which allows firms to take a credit of 20 percent on increases in R&D over a fixed-base period. However, because of limitations with the regular credit, in 2006 Congress created a new Alternative Simplified Credit (ASC) that lets companies receive a credit of 14 percent of the amount of qualified expenses that exceed 50 percent of the average qualified research expenses for the preceding three years. States should follow the model of Washington state which recently passed legislation allowing firms there who take the federal ASC to also take the state credit.[33] Doing this ensures that their state firms that take the federal ASC can also take the state credit.

Extend sales tax parity for manufacturing purchases of computers and IT equipment. Most states provide a sales tax exemption for manufacturers for equipment purchased in the manufacturing process, and some even provide tax credits for the purchase of manufacturing equipment. But few extend this exemption (or credit) to computer and other IT equipment used in the rest of the plant, even though, from a productivity and competitiveness standpoint, it can have an even bigger impact than a traditional piece of machinery.

For example, Washington state's rules governing its manufacturing sales tax exemption state that manufac-

turing computers qualify only if the computers "direct or control machinery or equipment that acts upon or interacts with tangible personal property" or "if they act upon or interact with an item of tangible personal property." Many other states have similar restrictions.[34] States should follow Wyoming's example which now allows for a sales/use tax exemption on all manufacturing equipment.[35]

Enact collaborative R&D tax credits. Several states provide more generous collaborative R&D tax credits to SMEs working with state universities. For example, Virginia offers a 20 percent credit for research done in partnership with a Virginia university.[36] Likewise, Louisiana offers a 40 percent refundable tax credit for R&D expenses and for investments involved in commercialization of Louisiana technology.[37] Other states should adopt similar policies.

Expand apprenticeship and co-op programs, school-to-work programs, industry-skills alliances, tax credits for employer-based training, and employer-community college partnerships. Instead of reflexively focusing on spurring more enrollment in higher education, states should focus more resources on these types of programs that better prepare individuals with skills in demand by traded sector employers and facilitate individuals getting more on-the-job work experience. A number of states have moved in this direction.

Wisconsin and Georgia have strong youth apprenticeship programs. A number of states and local school districts have established career academies within high schools. Several states have established regional skills alliances – industry-led partnerships that address workforce needs in a specific region and industry sector.[38] Michigan has provided competitively awarded startup grants and technical assistance to 25 industry-led regional skills alliances.

Pennsylvania's $15 million Industry Partnerships program brings together multiple employers, and workers or worker representatives when appropriate, in the same industry cluster to address overlapping human capital needs. In addition, Pennsylvania has supported a number of specialized industry-led training institutes, such as the Precision Manufacturing Institute,[39] the Advanced Skill Center,[40] and New Century Careers.[41]

Other states have established tax credits for company investments in workforce development. California has a deduction for training expenses if a company has spent a certain share of sales on training. Firms in Rhode Island can deduct up to 50 percent of training costs on their corporate income taxes.[42]

CONCLUSION

John F. Kennedy once famously stated that a rising tide lifts all boats. This is true even when the boats are state and local economies. A rising national tide (e.g., a robust and growing U.S. economy) lifts state and regional economies. This is not to say that this is enough; states and communities still need active and smart economic development policies and programs. But unless we get a stronger national economy, it will be hard for states and localities to grow their economies and a strong national economy depends on restoring U.S. manufacturing competitiveness.

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ENDNOTES

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3 Ibid. While manufacturing workers are becoming more educated and skilled, still 47 percent of U.S. manufacturing workers have not completed education beyond high school (with about 36 percent of the U.S. manufacturing workforce having high school but no college education and 11 percent not having completed high school).

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18 ITIF employed the Törnqvist index (used by the Bureau of Labor Statistics) as opposed to the Fisher Ideal index (used by the Bureau of Economic Analysis) to compute quantity aggregates. The two are equally good. See Jack E. Triplett, "Economic Theory and BEA's Alternative Quantity and Price Indexes," *Survey of Current Business* 72, no. 4 (1992): 49-52.

19 Bureau of Economic Analysis, Industry Economic Accounts (chain-type quantity indexes for value added by industry; accessed January 18, 2012), http://www.bea.gov/industry/index.htm. Author's analysis. Private business value-added quantity minus manufacturing value-added quantity was re-aggregated using a Törnqvist index.

20 Ibid.

21 These are California, Colorado, Hawaii, Kentucky, Louisiana, Montana, Oklahoma, Texas, West Virginia, and Wyoming.

22 These are, in order of loss from most to least, Ohio, Arkansas, West Virginia, Michigan, Georgia, Montana, Missouri, Kansas, Rhode Island and Pennsylvania.

23 NAICS 334 output in 2010 is estimated since BEA only has data for 2009 output at the sub-industry level. The analysis assumes that 334 output increased in every state at the same rate as the national average. It then subtracts this number from 2010 durable goods output and adds in the number of the 2000 output times 128 percent.

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