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New York State Economic Status of Regions and Development Programs

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New York State: Economic Status of Regions and Development Programs

JEL No.: R12, R58

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Summary

New York State's (NYS) private sector employment grew 14.4 percent between 2000 and 2017 and roughly kept pace with national private sector employment growth of 15.2 percent. Within NYS, employment growth is imbalanced. New York City (NYC) and adjacent Long Island and Westchester have a combined private employment growth rate of 18.2 percent over the period, and these areas have driven NYS employment growth for decades. The rest of the NYC-Albany corridor; namely, the Mid-Hudson region and the Capital area, exhibit 10 to 11 percent employment growth rates. The regions that lie north and west of the NYC-Albany corridor exhibit stagnant employment growth and population losses. Private sector employment growth between 2000 and 2017 ranged from 0.1 percent in the Southern Tier (Binghamton area) to 5.8 percent in the Finger Lakes (Rochester area). Population in these areas over the same period declined between 0.5 percent in the Finger Lakes and 2.8 percent in the Southern Tier. Except for the Albany region, wage growth in all NYS regions lagged the national average of 19.1 percent over the same period.

Five notable trends have had significant impacts NYS's regional economies. Three mirror trends across the nation, as economies have shed manufacturing jobs and services have gained jobs, albeit not in the same regions that shed manufacturing jobs. The other two seem unique to New York:

1. Technological change more so than globalization in NYS has reduced middle-wage jobs. As a result, job growth in economies has become polarized, with job growth occurring predominantly in low-wage service and high-wage, knowledge-based occupations.

2. The high-wage jobs grow in places that have and continue to attract educated and skilled workers. Firms using skilled workers cluster to take advantage of greater productivity. The clusters attract more knowledge-based firms and educated workers.
3. Employers that hire middle-wage workers report a “skills gap.” NYS agencies project strong employment growth in occupations that require education levels between a high school diploma and a bachelor’s degree, and all regions of NYS lack enough workers with training and credentials for these job openings.
4. NYS’s poverty rate now surpasses the national average. In 44 percent of counties, poverty *increased* during the recent economic expansion.
5. NYS in general lags the nation in business creation, and the upstate region lags in venture capital investment.

NYS has attempted for decades to spur economic development throughout the State, using a variety of fiscal tools, that include tax breaks for businesses that locate in specific areas and mega deals - tax breaks and/or large grants for infrastructure - to retain or attract large businesses. Beginning in 2011, NYS revised its approach to economic development. It organized its 62 counties into ten Regional Economic Development Councils (REDC). The REDCs submit economic development plans using the NYS guidelines; update the plans annually; and each year propose projects for funding. NYS, using its guidelines, annually funds projects proposed by each REDC. NYS guidelines for development include downtown revitalization; workforce development; implementation of strategic regional priorities that may include investing in regional clusters; promoting life sciences industries and other export-oriented jobs with high regional multipliers; and poverty reduction. From 2011 to present, NYS has allocated an average of \$750 million annually to REDCs to support their projects.

Evaluation of NYS economic development programs are irregularly performed and generally indicate that projects have four key weaknesses:

1. They are costly.
2. They are not well designed.
3. Transparency is limited, but where data exist, evaluations indicate the programs are mostly ineffective.
4. REDCs fund projects that are not always in line with strategic priorities and the funding is spread too thinly across too many projects.

Based on an extensive literature on regional economic development, local development efforts that invest in strategic industries instead of using tax breaks have shown promise. Notable turn arounds have occurred in Albany, NY, Grand Rapids, MI, Lehigh Valley, PA, and Pittsburgh, PA. These metropolitan areas have populations of no fewer than 800,000 people and have skilled workers with relatively high educational attainment. There are several themes that emerge from these success stories:

1. Successful development strategies are built around existing regional strengths, typically using clustering strategies. The transformations have involved one or more universities and/or medical facilities, and have targeted high-wage, export-based activities that have high multipliers to increase service jobs.
2. Groups of civic-minded leaders have formed organizations that employ full-time staff to guide ongoing strategic planning. The organizations have operating money derived from business contributions or government/tax resources.
3. Transformations require ongoing commitments and large and sustained - 20 years or more - investments of funds from government and private industry.
4. Workforce training is a central part of the strategies.

5. Large city and county economies drive regional economic growth. Less populated regions may require alternative investment strategies. For example, life sciences investments may not scale to an arbitrary number of areas in a state.
6. Regional leaders have developed approaches to supply venture capital to expand small businesses or fund startups.

Strengthen New York State’s economic development programs as follows:

1. Reinforce the REDCs. The REDC model appropriately uses a bottom-up approach that engages regional leaders and businesses in the planning process. It also builds on regional strengths and targets investments in well-paying industries. However, NYS spreads funding thinly within and across regions. To maximize development effectiveness, NYS should reduce the number of projects funded, and make larger and ongoing investments in projects with the largest potential for job creation. In addition, Empire State Development (ESD) should fund projects that have the greatest merit, using clear program goals, evaluation criteria, and track all project results over time.

2. Improve the design, transparency, and evaluation of economic development programs in order to modify or eliminate ineffective programs. The Citizens Budget Commission has suggested improving transparency of economic development programs, using a Unified Economic Development Budget to capture all project costs, standardizing program evaluation metrics, along with regular evaluation of programs. Eliminate ineffective programs, and redirect resources to programs that prove more effective.

In particular, the film tax credit as well as some ESD capital spending do not create permanent jobs in high value export-oriented industries. Eliminating the film and other production tax credits, and reducing ESD capital spending by half, would free \$1.1 billion for reinvestment.

3. Measure workforce skills gaps and provide retraining opportunities to workers. Efforts at quantifying and addressing skills gaps vary by region. Worker training programs need systematic input from businesses in different regions. The NYS Department of Labor could work with businesses in each REDC to identify major skills gaps and encourage businesses and community colleges to develop customized training programs for business needs. The State University of New York (SUNY) has multiple technical and community colleges in each REDC region. Community colleges partner with businesses in some REDCs to develop training programs. Strengthen the approach where it already exists and implement it across all REDCs. Similarly, identify effective community college programs and scale them up to additional educational institutions.

4. Provide stronger support for entrepreneurship. Venture capital has been and will likely remain concentrated in a few areas of the U.S. ESD could acquaint venture capitalists in New York City with upstate research facilities, as well as strengthen support for commercialization of innovations at major colleges and universities. NYS, perhaps through Federal Reserve Bank of NY, should study regional business lending patterns to identify major gaps, and where needed to encourage bank lending, NYS could provide partial loan guarantees for small businesses that show promise.

5. Consider safety net enhancements for workers in chronically depressed regions. Poverty in upstate cities and in three counties in NYC remain high, both historically and when compared to state and national averages. NYS can redirect funding from less effective development programs to person-based initiatives, such as wage subsidies, a more generous State Earned Income Tax Credit, and workforce training. In addition, research shows that investment in high quality pre-school programs increases income and social mobility among disadvantaged children. Pre-school may be the most effective means to reduce poverty and prepare youth for future jobs.

6. Improve the quality of life in regions through infrastructure investment in central cities and counties. While not a primary driver of development, successful development depends to some extent on cities having viable roads, bridges, water, storm water systems, and schools.

I. Introduction: Labor Mobility, Globalization, and Technology

Historically, labor and population mobility have caused convergence in employment growth, wages, and labor skills among regions of the United States. Researchers documented convergence of labor skills, wages, and productivity among regions from the 1880s into the 1990s, due to increasing labor mobility among regions.¹ Recently, globalization, technology, more clustering of knowledge industries to take advantage of productivity gains from agglomeration economies, and reduced labor mobility have created more disparate growth patterns among regions of the United States. Technology started to have a significant effect on manufacturing jobs in the 1980s, and robots have gradually replaced routine manufacturing jobs. The largest influence of technology on manufacturing jobs occurred between 1980 and 2000. Manufacturing jobs have become fewer and more skill intensive.² Globalization forces have had their largest effects on jobs since 2000. Companies accelerated moving operations to other countries, and more intercountry trade has increased U.S. imports of labor-intensive goods and reduced those jobs in the U.S.³

¹ Barro, Robert J. and Xavier Sala-i-Martin. 1991. "Convergence across States and Regions." *Brookings Papers on Economic Activity*. Vol. 1: 107-182. Barro, R. and Xavier Sala-i-Martin. 1992. Convergence. *Journal of Political Economy*. 100(2), 223-251. Retrieved from <http://www.jstor.org/stable/2138606>. Carlino, Gerald and Leonard Mills. 1996. "Convergence and the U.S. States: A Time-Series Analysis." *Journal of Regional Science*. 36: 597-616.

² Acemoglu, Daron and Pascual Restrepo. 2017. "Robots and Jobs: Evidence from the U.S. Labor Market." National Bureau of Economic Research, Working Paper No. 23285, March. There are negative employment and wages effects on workers in automobile manufacturing, electronics, metal products, chemicals, pharmaceuticals, plastic, food, glass and ceramics and negative but smaller effects in construction, business services, wholesale, services and retail. A few sectors show modest gains in employment, including finance, public sector, manufacturing areas that include recycling, basic metals, textiles, paper, furniture, and transportation equipment other than automobiles. See also, Autor, David. 2010. "Polarization of Job Market Opportunities in the U.S. Labor Market: Implications for Employment and Earnings." Center for American Progress, The Hamilton Project, an economics policy initiative of the Brookings Institution. <https://economics.mit.edu/files/5554>.

³ Autor, David H. and David Dorn. 2013. "The Growth of Low-Skill Service Jobs and the Polarization of the U.S. Labor Market." *American Economic Review*. 103 (5): 1553-97. Autor, David H., David Dorn and Gordon H. Hansen. 2013. "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." *American Economic Review*. 103(6): 2121-68. Autor, David H., David Dorn and Gordon H. Hansen. 2015. "Untangling Trade and Technology: Evidence from Local Labor Markets," *Economics Journal*. 125(584): 621-646.

Job shares in the U.S. and other countries have shifted from middle-wage manufacturing jobs toward jobs that pay lower wages, as well as to toward high-skilled jobs that pay well. High-skill jobs particularly take advantage of agglomeration economies and tend to cluster in larger cities and metropolitan areas. The spatial distribution of high-skilled workers has skewed toward larger cities and regions on either coast. Migration among areas has slowed substantially, especially after the year 2000. Workers can still earn more in growing metropolitan areas, but workers with lower skills cannot earn enough more to compensate for the increased housing costs in these areas. Workers who live in declining areas find that they cannot move to growing areas and improve their well-being. Consequently, regional convergence in skills, jobs, and wages has stopped, and there are widening differences in worker skills, wages, and job opportunities among regions. Policymakers have tried to use economic and political tools to foster development in declining locations of their states.⁴

The focus of this paper is on trends in population, employment, and investments in ten New York State (NYS) regions. The next section examines population and employment patterns in ten NYS regions. A third section reports on economic development initiatives that NYS has undertaken. A fourth section examines economic development spending in NYS and discusses its impact. A fifth section contains conclusions and recommendations.

II. Economic Trends in NYS: 2000-2017

The New York City (NYC) area dominates the NYS economy. NYS's regions to the north and west of NYC thrived in the latter part of the 19th century, buoyed by the Erie Canal project, and in the first part of the 20th century, led by manufacturing plants and jobs. However, NYS has lost manufacturing jobs,

⁴ Ganong, Peter and Daniel Shoag. 2017. "Why Has Regional Income Convergence in the U.S. Declined?" *Journal of Urban Economics*. 102: 76-90.

initially due to migration of firms out of the Northeast and Mid-Atlantic regions, and more recently due to substituting technology for many manufacturing and service sector jobs. Replacing the lost, well-paying manufacturing jobs has proven challenging in many NYS regions. Several regions of the state have experienced both job and population losses coupled with growing poverty rates since at least the mid-1980s and accelerating since the mid-1990s.

Areas outside of the NYC-to-Albany corridor have also lost a disproportionate share of educated and skilled workers, as they have migrated to metropolitan areas with better employment and earnings prospects. These areas are not destination regions for newer educated and skilled workers. Newer high-tech firms do not find these regions attractive locations because they do not have clusters of high-skilled labor in the areas. In turn, new high-skilled workers do not consider these areas attractive destinations because they do not have an array of employers that demand high-skilled labor.

To illustrate the economic presence and growth dominance of NYC within NYS, private sector total employment in NYS between 2010 and 2017 grew 16.7 percent compared to 19.1 percent in the nation. Using a common downstate/upstate regional definition, total private sector employment in the downstate region (New York City, Long Island, and Westchester County) grew 18.2 percent during the 2010 to 2017 period, while total private sector employment in the rest of the state - the upstate region - grew only 0.9 percent over the same period.⁵

The disparate growth patterns between upstate and downstate regions has persisted for decades. However, the difference between the downstate and upstate private sector employment growth rates has widened over time.

⁵ Downstate for these purposes refers to eight counties - the seven counties in NYC and Long Island plus Westchester County.

Uneven Growth Patterns among Upstate Regions

In 2011, NYS added a regional dimension to its economic development policy approach. NYS assigned each of its 62 counties to one of ten Regional Economic Development Councils (REDC). Each REDC contains between two and nine counties. Figure 1 illustrates the county/REDC configuration. The NYC, Long Island, Mid-Hudson, and Capital REDCs together have 75 percent of NYS's population. REDCs outside of New York City and Long Island contain medium-sized cities (metropolitan statistical areas with populations between 500,000 and 1 million people), suburban, and rural areas within each of them.⁶

Table 1 exhibits trends in population, employment, and average annual pay in the ten REDCs during the 2000 to 2017 period. (Table 1 lists the ten REDCs from the highest to lowest total private sector employment growth.) NYC, Long Island, and the Mid-Hudson REDCs have the highest population and employment growth rates over this period. The capital region has steady population levels over the period and employment growth at 10.4 percent, a rate approximately the same as the employment growth in the Mid-Hudson and Long Island REDCs.⁷ NYC leads all REDCs in population and employment growth, and employees in NYC have the highest average annual pay at \$93,099. Long Island and Mid-Hudson REDCs each has average annual pay of approximately \$57,000, while average annual pay ranges from \$38,628 in the North Country REDC to \$50,416 in the Capital REDC. (The Capital region benefits from a large government and state university presence, as well as a significant nanotech sector.⁸)

⁶ <http://www.newgeography.com/content/004910-americas-mid-sized-metropolitan-areas>

⁷ The Capital region benefits from a large government and state university presence, as well as a significant nanotech sector. Saunders, Pete. "State Capitals and College Towns: A Recipe for Success." *Forbes*. November 17, 2017. <https://www.forbes.com/sites/petesauanders1/2017/11/29/state-capitals-and-college-towns-a-recipe-for-success/#503b116781af>

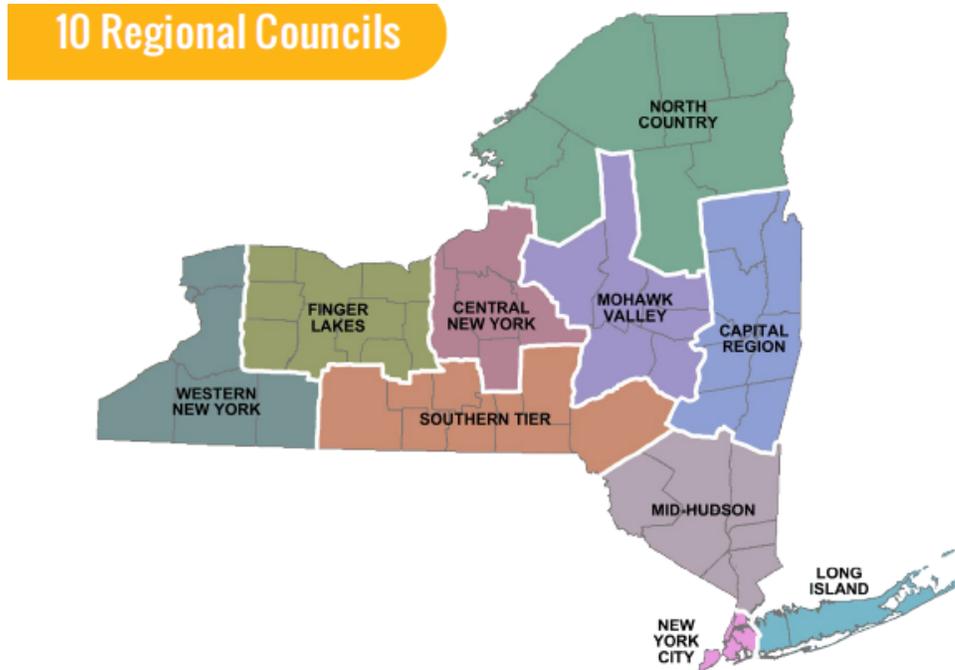
⁸ Saunders, Pete. "State Capitals and College Towns: A Recipe for Success." *Forbes*. November 17, 2017. <https://www.forbes.com/sites/petesauanders1/2017/11/29/state-capitals-and-college-towns-a-recipe-for-success/#503b116781af>

The eastern portion of NYS from NYC to Albany has steady to robust growth, while areas to the west and north of the eastern portion have stagnant to declining economies.

Private sector employment growth ranged from 0.1 percent in the Southern Tier (Binghamton area) to 5.8 percent in the Finger Lakes (Rochester area). Population declines ranged from 2.8 percent in the Southern Tier to 0.5 percent in the Finger Lakes. Average annual pay growth matches the national rate of 19.1 percent in the Capital region, and it lags the national average in the other nine REDCs. Annual pay in other REDCs has grown at about the NYS average.

Figure 1

New York State's Regional Economic Development Councils and their Constituent Counties



Western New York: Allegany, Cattaraugus, Chautauqua, Erie, Niagara

Finger Lakes: Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, Yates

Southern Tier: Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, Tompkins

Central New York: Cayuga, Cortland, Madison, Onondaga, Oswego

Mohawk Valley: Fulton, Herkimer, Montgomery, Oneida, Otsego, Schoharie

North Country: Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis, St. Lawrence

Capital Region: Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, Washington

Mid-Hudson: Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

New York City: Bronx, Kings, New York, Queens, Richmond

Long Island: Nassau, Suffolk

Source: https://www.ny.gov/sites/ny.gov/files/atoms/files/REDCAwardsBooklet2016_FINAL.pdf

Table 1**Population, Employment and Average Wage Growth by Region, 2010 - 2017**

Region	Population 2017	Population Change 2010-2017 In percent	Private Sector Employment 2017	Percent Change in Private Sector Employment 2010-2017	Private Sector Average Annual Pay 2017	Percent Change in Average Wage 2010-2017
United States	325,147,121	5.1	122,390,331	15.2	\$55,331	19.1
New York State	19,849,399	2.4	7,900,077	14.4	\$71,852	16.7
REDCs						
New York City (5 counties)	8,622,698	5.5	3,713,602	22.1	\$93,099	13.8
Long Island (2 counties)	2,862,467	1.0	1,106,877	11.2	\$57,515	14.9
Mid-Hudson (7 counties)	2,341,131	2.2	771,271	10.6	\$57,144	10.4
Capital (8 counties)	1,088,994	0.9	413,571	10.4	\$50,416	19.1
Finger Lakes (9 counties)	1,210,895	-0.5	468,506	5.8	\$47,756	16.3
Western New York (5 counties)	1,390,144	-0.7	523,168	4.9	\$44,438	18.5
Central New York (5 counties)	780,230	-1.5	279,878	2.7	\$46,857	15.7
Mohawk Valley (6 counties)	488,221	-2.4	148,028	2.4	\$39,175	16.1
North Country (7 counties)	424,898	-1.9	106,916	1.4	\$38,628	11.3
Southern Tier (8 counties)	639,721	-2.8	208,591	0.1	\$47,290	16.6

Sources: Population and population growth comes from the U.S. Census and

https://www.health.ny.gov/statistics/vital_statistics/2010/table02.htm

Employment and wage data come from the U.S. Bureau of Labor Statistics.

https://www.bls.gov/cew/datatoc.htm#NAICS_BASED

<https://data.bls.gov/pdq/SurveyOutputServlet>

<https://data.bls.gov/cgi-bin/dsrv>

Service Oriented Regional Economies

Table 2 reports the three major industries that employ the highest percentage of workers in each of the ten REDCs and the U.S. Seven of the ten REDC regions in NYS have slowly transitioned from manufacturing based economies to become service economies with transportation, trade, and utilities; professional and business services; and education and health services responsible for 55 percent or more of the jobs in those regions. These mirror employment percentages in the national economy.

Two of the REDCs - Southern Tier and Mohawk Valley - have manufacturing as the third highest employment category, and they have two of the three slowest rates of employment growth between 2010 and 2017 (Table 1). A third REDC - North Country - has employment in leisure and hospitality services as its third highest employment category. That REDC has the lowest average annual pay in 2017 (Table 1). REDCs that have transitioned out of manufacturing and rely less on tourism have had more success with employment growth and have higher average annual pay. The most western areas of NYS - Finger Lakes (Rochester) and Western New York (Buffalo) REDCs - have had the most employment growth among the six REDCs outside of the NYC-to-Albany corridor.

Table 2**Largest Three Employment Industry Sectors in 2017 by REDC**

REDC	Industry with Largest Share of Employment	Industry with Second Largest Share of Employment	Industry with Third Largest Share of Employment	Total Share of Employment for Three Largest Industry Sectors
Capital Region	EMD 23.4%	TTU 21.2%	PBS 14.6%	59.2%
Central New York	TTU 24.4%	EMD 22.0%	PBS 12.8%	59.2%
Finger Lakes	EMD 24.7%	TTU 19.3%	PBS 14.5%	58.5%
Long Island	TTU 23.9%	EMD 22.7%	PBS 15.0%	61.6%
Mid-Hudson	EMD 25.3%	TTU 23.1%	PBS 13.6%	62.0%
Mohawk Valley	EMD 28.9%	TTU 24.1%	MFG 12.1%*	65.1%
New York City	EMD 23.8%	PBS 19.0%	TTU 16.6%	59.4%
North Country	TTU 25.7%	EMD 25.1%	LHS 15.2%	66.0%
Southern Tier	EMD 26.3%	TTU 20.5%	MFG 15.9%	62.7%
Western New York	TTU 21.5%	EMD 20.5%	PBS 13.7%	55.7%
United States	TTU 22.3%	EMD 18.1%	PBS 16.6%	57.0%

Legend: EMD = Education and health services
 TTU = Trade, Transportation, and Utilities
 PBS = Professional and Business services
 MFG = Manufacturing
 LHS = Leisure and Hospitality Services

*LHS and MFG have 12.1 percent of total private employment in the Mohawk Valley.

Source: U.S. Bureau of Labor Statistics. https://www.bls.gov/cew/datatoc.htm#NAICS_BASED

Polarization of Economy into High and Low Wage Jobs

Globalization – in the forms of offshoring and trade in goods and services – affected jobs in the U.S., with its largest effects in the first decade of the 21st century. Autor, Dorn, and Hansen examine the effects that competition from imports have had on the U.S. labor market, especially after 2000.⁹ Autor has also shown for the U.S. that technology has replaced middle-wage jobs in manufacturing and some service sectors that have involved routine tasks.¹⁰ Autor, Dorn, and Hansen succinctly summarize the effects of both globalization and automation on workers and jobs.¹¹ “Concurrent with the rapid growth of U.S. imports from China, the effect of trade competition on the manufacturing sector has become stronger over time, while the effects of technological change on employment composition in the manufacturing sector has subsided. Nationally, jobs in middle-wage occupations have grown more slowly than jobs in high- and low-wage occupations.

Autor shows the effect of globalization on job losses by region. (Figure 2). Acemoglu and Restrepo in a series of papers show the effects of automation on U.S. workers’ by their occupations, education levels, sex and region of residence in the U.S.¹² (Figure 3). Technology, more than globalization, has affected jobs loses in NYS.

⁹ Autor, David H. and David Dorn. 2013. “The Growth of Low-Skill Service Jobs and the Polarization of the U.S. Labor Market.” *American Economic Review*. 103 (5): 1553-97. Autor, David H., David Dorn and Gordon H. Hansen. 2013. “The China Syndrome: Local Labor Market Effects of Import Competition in the United States.” *American Economic Review*. 103(6): 2121-68.

¹⁰ Autor, David. 2010. “Polarization of Job Market Opportunities in the U.S. Labor Market: Implications for Employment and Earnings.” Center for American Progress, The Hamilton Project, an economics policy initiative of the Brookings Institution. <https://economics.mit.edu/files/5554>.

¹¹ Autor, David H., David Dorn and Gordon H. Hansen. 2015. “Untangling Trade and Technology: Evidence from Local Labor Markets.” *Economic Journal*. 125(584): 621-646.

¹² Acemoglu, Daron and Pascual Restrepo. 2017. “Robots and Jobs: Evidence from the U.S. Labor Market.” National Bureau of Economic Research, Working Paper No. 23285, March. There are negative employment and wages effects on workers in automobile manufacturing, electronics, metal products, chemicals, pharmaceuticals, plastic, food, glass and ceramics and negative but smaller effects in construction, business services, wholesale, services and retail. A few sectors show modest gains in employment, including finance, public sector, manufacturing areas that include recycling, basic metals, textiles, paper, furniture, and transportation equipment other than automobiles.

I examine wage-job polarization in NYS. Detailed data that allow occupational classification according to wage levels are available for metropolitan areas (MSA) of NYS. Although MSAs are not coincident with REDCs, they contain a major portion of the jobs in NYS. The MSA data on employment growth by occupation wage levels add insight on the degree of wage polarization in NYS's regional economies.

Figure 2

Effects of Globalization on Jobs

Most-affected areas of the U.S.

Colors show which areas were most affected by China's rise, based on the increase in Chinese imports per worker in each area from 1990 to 2007. Hovering over each area on the map will show a demographic breakdown of that area, below, and its most-affected industries, at right.

Most-affected 20% Second-highest 20% Middle 20% Second-lowest 20% Least-affected 20%

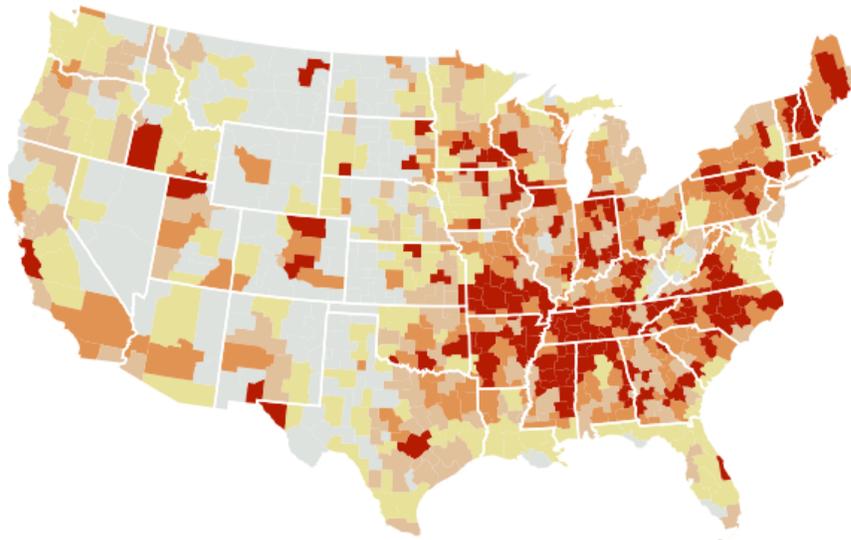


Figure Source: David Autor Web page <http://chinashock.info>

Figure 3

Effects of Technological Change on Jobs

A. Exogenous exposure to robots from 1993 to 2007

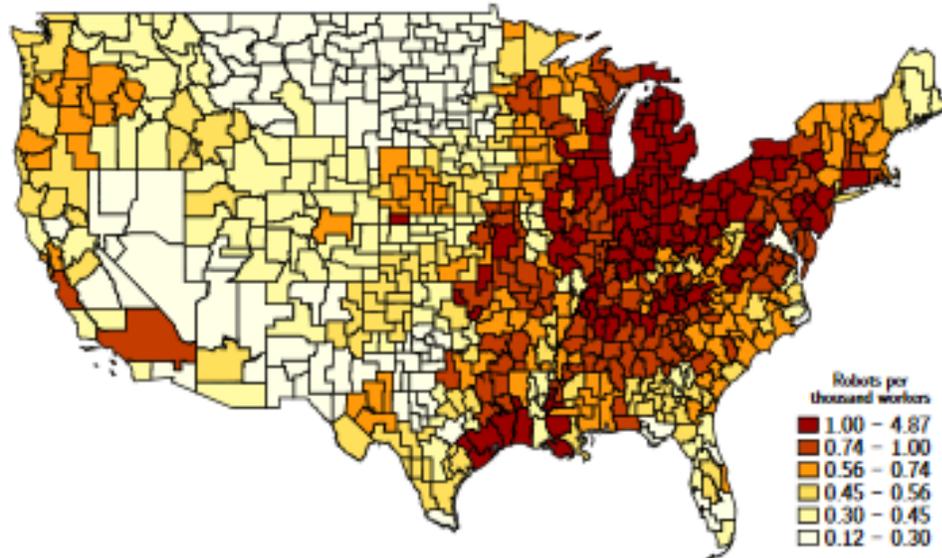


Figure Source: Asemoglu and Restrepo (2017).

To categorize jobs by high-, medium- and low-wage occupations, we start with the average pay in 2010 in NYS, which is \$38,880. For the analysis here, I categorize low-wage occupations as those in which NYS employees' annual pay averages between \$22,850 and \$34,040 in 2010. Medium-wage occupations have average salaries between \$34,220 and \$53,420; high-wage occupations have average salaries between \$56,640 and \$110,990 in 2010. (Appendix 1 lists the types of occupations in each wage category.) Note that in NYS, 59 percent of jobs are low-wage; 25 percent are high-wage; and 16 percent are middle-wage by 2017.

Table 3 reports employment growth between 2010 and 2017 in high-, medium- and low-wage occupations in NYS and its metropolitan areas. For NYS overall, high-wage jobs have increased 18.3 percent over the period, whereas low-wage jobs have increased 8.7 percent, and medium-wage jobs have increased 8 percent. While high-wage jobs are 25 percent of the employment base in NYS, they have grown more than two times faster than low- and medium-wage jobs, and medium- and low-wage jobs have grown at roughly the same rates since 2010.

Job-wage polarization is also evident in NYS's metropolitan areas. With the exception of the Binghamton MSA, high-wage jobs have grown faster than medium-wage and low-wage jobs in MSAs. With the exceptions of the Binghamton and the Buffalo-Niagara Falls MSAs, medium-wage jobs grew more slowly or shrank faster than low-wage jobs in NYS's MSAs. While the NYC MSA has had robust job growth in the three wage categories, it also exhibits polarized job growth pattern with high- and low-wage jobs growing faster than medium-wage jobs.

Table 3**Employment Growth in High-, Medium- and Low-Wage Occupations in New York State and its MSAs: 2010 - 2017**

New York State MSAs	High-Wage	Medium-Wage	Low-Wage
New York State	18.3%	8.0%	8.7%
<i>Metropolitan Areas</i>			
Albany-Schenectady-Troy, NY	11.07%	1.81%	4.44%
Binghamton, NY	-9.49%	1.96%	-7.11%
Buffalo-Niagara Falls, NY	10.91%	2.84%	2.15%
Elmira, NY	-0.80%	-13.29%	-4.23%
Glens Falls, NY	5.88%	-15.46%	4.02%
Ithaca, NY	43.64%	-23.34%	3.07%
Kingston, NY	3.21%	-6.13%	3.15%
Nassau-Suffolk, NY	13.98%	6.77%	6.93%
New York-White Plains-Wayne, NY-NJ	40.61%	28.28%	33.47%
Rochester, NY	12.18%	1.91%	4.41%
Syracuse, NY	2.64%	0.98%	0.49%
Utica-Rome, NY	10.73%	-7.66%	-0.24%

Source: U.S. Bureau of Labor Statistics. <https://www.bls.gov/oes/tables.htm>

Role of Agglomeration and Firm Clustering in High-Wage Jobs

The economics literature has long cited the productivity benefits associated with similar firms clustering together.¹³ Productivity gains from agglomeration occur primarily through four channels: a) locations near shipping nodes or natural resources; b) labor market hiring efficiencies, when workers with specialized skills concentrate in areas; c) knowledge transfers among skilled workers; and d) high demand for inputs allows businesses to specialize and produce intermediate inputs at lower costs. That is, agglomeration economies lower costs of hiring labor, of knowledge acquisition, and of inputs into production.

Agglomeration economies increase with population size, and larger cities or metropolitan areas with concentrations of skilled labor and large numbers of enterprises have more agglomeration economies. The higher productivity increases the demand for labor, and workers' wages and earnings increase. Firms benefit from agglomeration through productivity gains, workers benefit with higher earnings, and current homeowners/landlords benefit from higher housing prices.¹⁴

Clustering can occur among firms in the same industry, as well as among firms in related industries. Small firms benefit more from clustering than larger firms; the latter appear to internalize agglomeration economies. Ellison and Glaeser find that the degree of clustering varies considerably among industries.¹⁵ For example, 43 percent of industries exhibit very little clustering and 13 percent, including tobacco,

¹³ Marshall, Alfred. 1920. *Principles of Economics*. London MacMillan, and Jacobs, Jane. 1969. *The Economy of Cities*. New York Vintage.

¹⁴ Glaeser, Edward and David C. Maré. 2001. "Cities and Skills." *Journal of Labor Economics*. 19 (2): 316-342. JSTOR, JSTOR, www.jstor.org/stable/10.1086/319563. Moretti, Enrico. 2011. "Local Labor Markets." In Orley Ashenfelter and David Card, eds., *Handbook of Labor Economics*, Vol. 4B London: Elsevier, pp. 127-1313.

¹⁵ Ellison, Glenn and Edward L. Glaeser. 1997. "Geographic Concentration in U.S. Manufacturing Industries: A Dartboard Approach." *Journal of Political Economy*. 105 (5): 889-927. JSTOR, JSTOR, www.jstor.org/stable/10.1086/262098.

textiles and leather, and wine, exhibit “extreme clustering.” Glaeser et. al. find knowledge spillovers tend to occur among industries rather than within a particular industry.¹⁶

Rosenthal and Strange find that smaller firms benefit from the presence of other small firms.¹⁷ In another paper, Rosenthal and Strange find knowledge spillovers occur within a zip code, and attenuate rapidly beyond a single zip code.¹⁸

States engage in mega deals that grant large tax breaks and/or provide infrastructure to retain or attract large plants that create sizeable numbers of jobs. Beyond direct job provision, Greenstone, Hornbeck, and Moretti show that very large manufacturing plants locations confer productivity benefits on plants already located in the same county, and employees at these extant plants will earn higher wages. Moreover, the largest productivity gains occur at extant plants that use similar technologies to and share labor pools with the newly located plant.¹⁹

The above agglomeration findings relate primarily to manufacturing industries. Agglomeration productivity effects and knowledge spillovers have significant effects in knowledge-based industries. These industries employ highly skilled workers who earn high wages. Significant clusters in these industries occur on the West Coast in California and on the East Coast in ten states from New Hampshire to Washington, D.C. Moretti notes that many high-tech clusters occur through major medical centers, as

¹⁶Glaeser, Edward L., Hedi D. Kallal, Jose A Scheinkman and Andrei Shliefer. 1992. “Growth in Cities.” *Journal of Political Economy*. 100 (6): 1126-1152.

¹⁷ Rosenthal and Strange find that firm births occur more frequently in places that already have smaller firms (25 or fewer employees) in the same industries, suggesting that the agglomeration benefits smaller firms. Rosenthal, Stuart S. and William C. Strange. 2003. “Geography, Industrial Organization, and Agglomeration.” *The Review of Economics and Statistics*. 50 (2): 377-393.

¹⁸ Rosenthal, Stuart S. and William C. Strange. 2001. “The Determinants of Agglomeration.” *Journal of Urban Economics*. 50: 191-229.

¹⁹ Greenstone, Michael, Richard Hornbeck, and Enrico Moretti. 2010. “Identifying Agglomeration Spillovers: Evidence from Winners and Losers of Large Plant Openings.” *Journal of Political Economy*. 118 (3): 536 -598.

well as universities that produce knowledge spillovers for related industries.²⁰ Each high-tech, high-wage cluster creates up to five more jobs in service and other support businesses. Indirectly, workers in service industries gain jobs when agglomerations of high-tech firms attract more high-tech businesses.²¹ Buzard et al. in different work draw similar conclusions.²²

For NYS, New York City represents a prime example of long-standing agglomeration economies in sectors, such as finance, advertising, and fashion. Albany's growing nanotech industry represents a successful cultivation of a new regional specialization built around a skilled workforce and premier research universities (SUNY Albany and Rensselaer Polytechnic Institute, among others). Other larger metropolitan areas in NYS, including Buffalo, Rochester, Syracuse, Utica, and Binghamton, benefit from major educational and/or health-related institutions.

²⁰ Moretti, Enrico. 2012. *The New Geography of Jobs*. New York: Houghton, Mifflin, Harcourt.

²¹ Moretti, Enrico 2010. "Local Multipliers." *American Economics Review*. 100 (2): 373-377.

²² Buzard, Kristy, Gerald A Carlino, Robert M. Hunt, Jake K. Carr and Tony E. Smith. 2017. "The Agglomeration of American R&D Labs." *Journal of Urban Economics*. 101: 14-26.

Education Levels among NYS Workers

As noted above, technological change has primarily affected workers in three educational attainment categories: less than high school, high school, and some college. NYS is among the states most vulnerable to employment losses from technological changes and these changes will continue to impact occupations with routine duties.²³

REDCs with educated workforces will have less vulnerability to job loss through technology. Alternatively, workers in some REDCs may not have the right set of skills to participate as much as they could in advanced regional economies.

REDC reports and the New York Association of Training and Employment Professionals (NYATEP) have identified skill gaps between the skills required for available jobs and the supply of workers' skills. A recent NYATEP report notes that 45 percent of the jobs created between 2014 and 2024 will require workers with middle-level skills, typically training beyond high school, but less than a four-year baccalaureate degree.²⁴ The same report states that NYS has supply shortages in workers with this training. Nonetheless, there is not statewide data and no systematic data collection on skill gaps at either the state or regional levels.

Table 4 exhibits for the U.S., NYS, and each REDC, the percentage of residents in each of the four educational attainment levels - less than high school, high school graduate, some college or associates

²³ Acemoglu, Daron and Pascual Restrepo. "Robots and Jobs: Evidence from the U.S. Labor Market." MIT Working Paper May 2017. There are negative employment and wages effects on workers in automobile manufacturing, electronics, metal products, chemicals, pharmaceuticals, plastic, food, glass and ceramics and negative but smaller effects in construction, business services, wholesale, services and retail. A few sectors show modest gains in employment, including finance, public sector, manufacturing areas that include recycling, basic metals, textiles, paper, furniture, and transportation equipment other than automobiles.

²⁴ New York Association of Training and Employment Professionals and New York City Labor Market Information Service. 2017. "A Labor Market Snapshot for New York State, 2017." Brief. https://docs.wixstatic.com/ugd/dd664a_6cf59ce31aea4dc7b1b047203b019466.pdf

degree, and college or advanced degree. Compared to the nation, NYS has a higher percentage of residents who are 25 years of age or older with baccalaureate or advanced degrees. On the other hand, it also has a larger percentage of residents who do not finish high school, lower percentages with high school degrees, and lower percentages with some college training beyond high school.²⁵

Among REDCs, persons completing college or holding advanced degrees concentrate in the New York City, Long Island, and the Mid-Hudson REDCs; populations in the other seven REDCs lag behind the national averages for holding college or advanced degrees. However, the counties within each of the seven REDCs have a wide range of percentages for the 25 and older cohort who hold baccalaureate or advanced degrees. As one example, more than 50 percent of Tompkins County's residents - in the Southern Tier and county home of Cornell University - have baccalaureate or advanced degrees. Three other REDCs - Capital, Finger Lakes, and Western New York - also each have a county in which the percentage of residents with baccalaureate or advanced degrees are at or exceed the NYS average.

At the other end of the educational spectrum, New York City has the largest percentage of residents who did not finish high school. The Mid-Hudson, Mohawk Valley, and North Country regions also have larger percentages of their residents with less than a high school education than the average in the United States.

To address the skills gap, some workforce training has occurred at community and technical colleges in the State University of New York (SUNY) system. Each of the 64 community colleges throughout NYS develop curricula and provide a range of educational services from remedial mathematics and language arts to training certificates in advanced manufacturing and health industries. Some institutions work in

²⁵ The data source is the American Community Survey for the 2012 to 2017 period. The data for counties are small samples subject to large sampling errors for any county in a single data year. Using data averaged over five years increases the sample size in each county, reduces sampling error and increases the reliability of the estimates.

conjunction with businesses in REDCs to design curricula applicable to jobs businesses demand. The strength of these partnerships varies among the REDC areas, and at many educational institutions, there are no formal channels for routinely soliciting employers' input to ensure that community college course offerings align as well as they could with skills local employers need. NYS, perhaps through its Department of Labor, could engage REDCs in systematic evaluations of skills in the regions and training deficits that might inform the educational services offered at various community colleges.²⁶

²⁶ In addition to technical training for specific tasks and certification for some occupations, the NYATEP report describes gaps in middle-skill proficiency for “soft-skills” and interpersonal skills. NYATEP describes the top six “soft” employability traits as communication skills, writing, organizational skills, teamwork and collaboration, and detail-oriented and planning.

Table 4

Educational Attainment: Percent of Residents 25 Years of Age or Older in each Educational Category: U.S., NYS and NY Regions: 2012-2017

	Less than H.S.	H. S. Degree	Some College or Associate's Degree	Baccalaureate or Higher
U.S.	10.4	28.8	26.6	34.2
New York State	13.8	26.2	24.9	35.1
REDCs				
Capital (range for REDC counties)	7.8 (7.2 - 11.6)	26.5 (25.1 - 39.4)	27.8 (27.4 - 33.6)	31.9 (21 - 40.1)
Central NY (range for REDC counties)	10.0 (9.1 - 13.3)	29.7 (25.7 - 38.9)	30.8 (28.2 - 33.7)	29.6 (28.2 - 34.0)
Finger Lakes Range (range for REDC counties)	9.5 (7.1 - 14.4)	28.0 (24.3 - 40.1)	30.5 (28.2 - 34.0)	32.0 (16.5 - 36.9)
Long Island (range for REDC counties)	9.4 (9.0 - 9.8)	26.2 (23.5 - 28.7)	25.4 (23.7 - 26.9)	39.1 (34.7 - 43.8)
Mid-Hudson (range for REDC counties)	11.1 (7.2 - 13.1)	23.9 (24.3 - 40.8)	25.2 (28.2 - 34.0)	39.8 (22.8 - 47.9)
Mohawk Valley (range for REDC counties)	11.4 (9.3 - 15.1)	35.1 (19.4 - 33.5)	31.2 (20.6 - 31.0)	22.3 (16.2 - 28.7)
North Country (range for REDC counties)	10.7 (9.2 - 13.7)	34.9 (30.7 - 44.7)	32.3 (29.0 - 35.7)	22.1 (15.6 - 26.1)
New York City (range for REDC counties)	19.3 (10.9 - 28.4)	24.2 (12.4 - 31.3)	20.8 (14.0 - 26.3)	35.7 (19.4 - 60.8)
Southern Tier (range for REDC counties)	9.3 (5.4 - 12.8)	32.4 (19.6 - 39.9)	29.4 (23.0 - 31.9)	29.0 (17.6 - 51.9)
Western New York (range for REDC counties)	9.4 (8.9 - 13.8)	30.8 (26.2 - 40.2)	30.9 (24.9 - 32.6)	29.0 (18.2 - 35.1)

Source: New York State Community Action Association. 2018. New York Annual Poverty Report. <http://nyscommunityaction.org/wp-content/uploads/2018/04/FINAL-VERSION-2018-POVERTY-REPORT-COMplete.pdf>

Business Creation and Venture Capital

New businesses and venture capital represent two additional measures of regional economic vibrancy. The U.S. Bureau of Labor Statistics collects information on establishment births and deaths in each state for each quarter of the year. To smooth quarterly fluctuations, I averaged 29 quarters of data on establishment births and deaths from the first quarter of 2010 through the first quarter of 2017 (29 quarters) for the 10 most populous states and New York's three neighboring states - Connecticut, New Jersey, and Pennsylvania. Table 5 contains the comparative data.

NYS ranks 7th out of the 13 states in net business births (the difference between average births and average deaths per total number of establishments); its rate of 0.21 percent is below the 50-state average of 0.27 percent. Among the 13 states in Table 5, Massachusetts, California, Texas, and Florida rank one through four, respectively, and their rates of net births range from 0.64 percent in Massachusetts to 0.38 percent in Florida. While NYS has lower net births than the top four states, NYS has more net births than its neighboring states.

Table 6 reports measures of venture capital by major region of the U.S. Venture capital investment is highly concentrated regionally. Six major areas account for 79 percent of the total venture capital investment in 2017 - San Francisco, Silicon Valley, the New York City Metropolitan Area, New England, Southeastern portion of the U.S., and Los Angeles/Orange County.

Table 5**Average Establishment Births, Deaths and Net Gains/Losses 2010 - 2017 for Various States**

State	Births	Rank	Deaths	Rank	Births less Deaths	Rank
California	3.55	2	3.04	3	0.51	2
Connecticut	2.28	12	2.22	13	0.06	10
Florida	3.73	1	3.35	1	0.38	4
Georgia	3.30	3	3.07	2	0.23	6
Illinois	2.77	9	2.67	7	0.10	8
Massachusetts	3.01	4	2.37	9	0.64	1
Michigan	2.40	10	2.32	11	0.08	9
New Jersey	2.89	8	2.84	4	0.05	11
New York	2.90	7	2.69	6	0.21	7
North Carolina	2.97	5	2.71	5	0.26	5
Ohio	2.22	13	2.22	12	0.00	13
Pennsylvania	2.37	11	2.32	10	0.05	12
Texas	2.91	6	2.50	8	0.41	3
U.S. Total	2.97		2.71		0.27	

Notes: Births are defined as new establishments as a percentage of total firms. The reported figures are arithmetic averages of births as a percentage of total establishments for 29 quarters from 2010 quarter 1 through 2017 quarter 1. Deaths are calculated in the same way. States include NY's neighboring states and a few fast growing states.

Source: U.S. Bureau of Labor Statistics, Business Employment Dynamics.

<https://www.bls.gov/bdm/bdmstate.htm#PA>

Upstate NY lagged all other regions in venture capital investments in 2017: there were only 23 deals and a total investment of \$160 million—compared to 811 deals and \$12.1 billion in investment in the New York City metro region. An upstate deal averages about \$7.0 million per project, a figure comparable to other regions with lower total investment.

After the financial crisis in 2008, major banks have shrunk lending to small businesses, especially in smaller cities in Upstate NY and rural areas of NYS. To some extent, smaller regional banks have stepped in to fill this gap in lending, but venture capital as a whole has not yet found the productive areas in many upstate communities.

Table 6

Venture Capital Investment and Deals by Region, 2010-2017

Region	Venture Capital Investment (in millions)			Venture Capital Deals			Average \$ per Venture Capital Deal (in millions)		
	2010	2017	Growth	2010	2017	Growth	2010	2017	Growth
New York City Metro	\$2,213	\$12,163	450%	357	811	127%	\$6.2	\$15.0	142%
Upstate New York	\$38	\$160	322%	18	23	28%	\$2.1	\$7.0	230%
South Central	\$37	\$231	524%	18	34	89%	\$2.1	\$6.8	231%
Southeast	\$1,029	\$5,227	408%	164	347	112%	\$6.3	\$15.1	140%
San Francisco	\$4,501	\$17,958	299%	527	1,102	109%	\$8.5	\$16.3	91%
Southwest	\$326	\$1,180	262%	65	124	91%	\$5.0	\$9.5	90%
North Central	\$253	\$890	252%	56	125	123%	\$4.5	\$7.1	58%
New England	\$2,806	\$7,696	174%	450	519	15%	\$6.2	\$14.8	138%
LA/Orange County	\$1,751	\$4,667	167%	209	421	101%	\$8.4	\$11.1	32%
Colorado	\$492	\$1,192	143%	98	183	87%	\$5.0	\$6.5	30%
DC/Metroplex	\$1,040	\$2,502	141%	122	204	67%	\$8.5	\$12.3	44%
Silicon Valley	\$5,482	\$12,504	128%	533	677	27%	\$10.3	\$18.5	80%
Northwest	\$1,043	\$2,280	119%	162	242	49%	\$6.4	\$9.4	46%
Sacramento/Northern California	\$85	\$179	111%	22	25	14%	\$3.9	\$7.2	86%
San Diego	\$774	\$1,307	69%	113	131	16%	\$6.9	\$10.0	46%
Midwest	\$2,168	\$3,449	59%	215	426	98%	\$10.1	\$8.1	-20%
Philadelphia	\$473	\$745	57%	99	93	-6%	\$4.8	\$8.0	68%
Texas	\$1,458	\$1,629	12%	177	200	13%	\$8.2	\$8.1	-1%
United States Total	\$26,001	\$76,027	192%	3,414	5,707	67%	\$7.6	\$13.3	75%

Source: <https://www.pwc.com/us/en/industries/technology/moneytree.html>

Poverty in NYS

Table 7 lists poverty rates in the U.S. and in NYS and its REDCs in 2010 and 2017. Between 2010 and 2017, a period of economic growth, the poverty rate in the U.S. declined 1.9 percentage points from 15.3 to 13.4 percent, while the poverty rate in NYS declined from 15.0 to 14.1 percent. Among the REDCs, poverty declined 2.1 percentage points in NYC; declined 1 percentage point in the Capital REDC; and changed relatively little in the other REDCs. Five REDCs - Mohawk Valley, NYC, North Country, Southern Tier, and Western New York - have poverty rates above the national and NYS averages. NYC leads NYS with a poverty rate of 18 percent in 2017. Although it declined, NYC has the highest rate of poverty among the REDCs. The poverty rate increased between 2010 and 2017 in 27 of NYS's 62 counties.²⁷

The evidence presented in Table 1 and Tables 3 through 7 suggests widening disparities among NYS regions and counties. Several regions - Mohawk Valley, North Country, and Southern Tier - have higher concentrations of poverty and a lower percentage of residents with baccalaureate and advanced degrees. Central New York and Western New York also lag behind the NYS average in both areas. Policy makers face two challenges - bringing jobs to declining regions and addressing poverty in NYS. These different problems require the application of different policy instruments.

²⁷ Among the 27 counties, the poverty rate increased in New York County and Richmond County between 2010 and 2017, while declining in the other three New York City counties. While the averages for New York City drive economic growth in New York State, NYC is also a tale of two cities with high income, high job creation, high venture capital investment and a highly educated population, as well as high poverty and a larger than average percentage of its population that has not finished high school.

Table 7**Poverty Rates: U.S. and NYS Regions: 2010 and 2017**

	Poverty Rate in Percent 2010	Poverty Rate in Percent 2017	Change in Poverty Rate
U.S.	15.3	13.4	-1.9
New York State	15.0	14.1	-0.9
Capital	11.5	10.5	-1.0
Central NY	14.2	13.9	-0.3
Finger Lakes	13.9	13.4	-0.5
Long Island	6.4	6.6	0.2
Mid-Hudson	10.1	10.2	0.1
Mohawk Valley	15.5	15.5	0.0
New York City	20.1	18.0	-2.1
North Country	15.4	15.6	0.2
Southern Tier	15.5	15.6	0.1
Western New York	14.7	14.6	-0.1

Source: U.S. Census Bureau Small Areas income and Poverty Estimates (SAIPE).

Widening regional disparities are not unique to NYS. Austin, Glaeser and Summers (AGS) observe similar widening disparities across regions of the United States, and they present data that attributes widening disparities among regions to high housing prices in high-productivity places that inhibits population mobility from declining regions to these growth areas.²⁸ As a result, there is less income convergence among regions, with increased concentrations of skilled workers in particular places, as well as persistent pockets of poverty and non-employment in other U.S. areas. Residents in these regions have become “stuck” due to an inability to move to high-cost areas.²⁹

In summary, the confluence of the effects of globalization, technological change, agglomeration and the growth in high-skilled jobs in larger cities has had large implications for jobs, wages and labor-force participation among less educated men in smaller MSAs and rural areas.³⁰ The divergence in growth between these areas has become wider since 2008.³¹ Giannone’s work summarizes these trends.³²

²⁸ Austin, Benjamin, Edward Glaeser and Lawrence H. Summers. 2018. “Saving the Heartland: Place-based policies in 21st Century America.” *Brookings Papers on Economic Activity*. Spring pp. 151-255. <https://www.brookings.edu/bpea-articles/saving-the-heartland-place-based-policies-in-21st-century-america/>

²⁹ Ganong and Shoag estimate that the rate of national inter county migration rate (number of movers divided by county population) declined from 6 percent in the 1992 to 2008 period to 3.7 percent in 2015. Intra county migration rates experience a similar slowdown declining steadily from 13 percent in 1950 to 7 percent in 2015. The composition of migrants also changed. Unskilled labor virtually stopped migrating to high-income growth areas between 1980 and 2010. See Ganong, Peter and Daniel Shoag. 2017. “Why Has Regional Income Convergence in the U.S. Declined?” *Journal of Urban Economics*. 102: 76-90.

³⁰ Molloy, Raven, Christopher L. Smith, Riccardo Trezzi, and Abigail Wozniak. 2016. “Understanding Declining Fluidity in the U.S. Labor Market,” *Brookings Papers on Economic Activity*. Spring 2016: 183–237.
Davis, Steven J., and John Haltiwanger. 2014. “Labor Market Fluidity and Economic Performance,” in *Economic Policy Symposium Proceedings: Re-Evaluating Labor Market Dynamics* (Jackson Hole, Wyoming: Federal Reserve Bank of Kansas City).

³¹ Hendrickson, Clara, Mark Muro and William A. Galston. 2018. “Countering the Geography of Discontent: Strategies for Left-Behind Places.” Brookings November.

³² Gianone, Elisa. 2017. “Skilled-Based Technical Change and Regional Convergence.” University of Chicago doctoral dissertation.

Summary: Trends in the New York State Economy Since 2010

NYS's regional economies exhibit seven notable trends. Four mirror trends across the nation and stem from economic restructuring toward a modern information economy; the other three seem unique to NYS:

1. Globalization has had modest effects on employment growth in NYS's regional economies.
2. Technological change has reduced employment growth in NYS's regional economies, and the employment effects are particularly strong for middle-wage jobs associated with routine tasks. Job growth in NYS's economy has become polarized with more job growth occurring in low-wage and high-wage occupations.
3. Regional economies have become more service oriented, and similar to the U.S. economy, most regions have had job growth in three major sectors - education and health; trade, transportation and utilities; and professional and business services.
4. For high skill jobs, clustering of workers and jobs has become more important for increasing productivity, a phenomenon known as agglomeration economies.
5. Employers report a "skills gap" among workers. In NYS, strong employment growth is projected in occupations requiring between a high school diploma and a bachelor's degree, and NYS may not have enough workers with training and credentials to fill these job openings.
6. New York lags the nation in business creation, and the upstate region lags in venture capital investment.
7. New York's poverty rate now surpasses the national average. In 27 of NYS's 62 counties, the poverty rate *increased* between 2010 and 2017, while the poverty rate decreased in the U.S. and in NYS as a whole.

III. Approaches NYS Uses to Promote Economic Development

Overview of Economic Development Programming

Business leaders, politicians, and policymakers at state and local levels in NYS have engaged various policies to address the worsening economic base in upstate areas. The policies range from generous tax credits to new businesses that locate in certain distressed areas to its recent reliance on regional economic development plans that follow NYS's broad guidelines for project funding. NYS has been slower to address the growing and persistent poverty in NYS, however.

NYS has used enterprise zones - labeled Empire State Zones that commenced in 1999. Eligible businesses located in any zone that increased investment and workers received: investment tax credits; state sales tax credits; tax credits against the state corporate income tax (or personal income tax credits for partnership businesses); wage subsidies of 25 percent (depending on the number of newly hired full-time workers who remain employed for six months or more); and property tax credits. Businesses received the above credits for up to 15 years. There were over 80 zones by the time the program ended in 2009. Businesses already in the Empire State Zone program by its end continue to receive the promised benefits.

The Empire State Zone program did not undergo regular and rigorous evaluations. NYS deemed the program less effective than it had anticipated. It changed the program to the Excelsior Program, which stiffened the qualifications for business eligibility; made the tax benefits less generous; and introduced tax credits for research and development.

NYS, as well as all other states, use "mega deals" to attract large businesses. Mega deals involve large expenditures and/or tax credits to attract a large business to an area. An organization that tracks mega

deals reports each of the deals valued at more than \$50 million (in nominal terms) in each state.³³ Since 1980, NYS has engaged in 32 mega deals that range in amounts from \$50.5 million for a bank in 1995 to \$5.6 billion to supply NYS Power to Alcoa. Mega deals are largely sui-generis and therefore do not in themselves amount to a coherent economic development policy.

A third approach to economic development in NYS and in other states uses large public/private investments to turn around a regional economy. Although Albany, NY has an advantage as it serves as the capital of NYS with government and supporting activities; houses a large public university (SUNY-Albany); and has as a leading engineering school (Rensselaer Polytechnic Institute) nearby, private industry in the area nonetheless began to experience economic decline in the 1970s and 1980s. In the mid-1980s, as a response, Governor Mario Cuomo led efforts to attract nanotechnology to the region and established the State University of New York Graduate Research Initiative on advanced semiconductors. In 1995, SUNY-Albany enhanced its capabilities in the sciences with new faculty hires and investment in research labs. NYS in partnership with major businesses together invested a half billion dollars to establish the College of Nanotechnology at SUNY-Albany in 2004. Tokyo Electronics contributed \$200 million to the SUNY Albany Center for Excellence.

Nanotechnology manufacturing companies began moving to the Albany area to take advantage of the nanotechnology innovations from research at the university and private companies. NYS continues to subsidize nanotechnology relocations in the area, including offering \$1.2 billion in incentives to Global Foundries to build a semiconductor factory in Malta - a suburb located 20 miles north of Albany. In

³³ <https://www.goodjobsfirst.org/megadeals>

addition, Hudson Valley Community College offers a 25-credit nanotechnology certificate for training necessary to qualify for entry-level positions in nanotechnology.

In 2010, NYS embraced regional investment in other areas of the State, albeit at lower dollar levels than in the Capital region. NYS organized its 62 counties into ten Regional Economic Development Councils (REDC) (Figure 1). Each REDC has formulated a development plan around a set of NYS industry priorities for development. NYS's priorities include high-paying, export-based industries; invest in life sciences industries; support for new innovations and emerging industries; build on existing industry clusters in regions; invest in job training to close skills gaps in regions; employ veterans; and invest in downtown infrastructure. REDCs annually update their strategic plans and apply for funding support for industry projects that have one or more of the above priorities. The Empire State Development (ESD) Corporation and/or the Department of Economic Development decide which projects to fund and the sources of the funding.³⁴ Projects generally receive direct investment support rather than relying on an array of subsidies for wages and tax credits. Some projects do receive Excelsior tax credits and wage subsidies, however.

Even with this change in development approach, NYS continues to award tax credits to particular industries and activities outside of the REDC framework. It awards the largest credits to Production, Research and Development, and to production of films, advertisements, and television shows.

The above approaches to economic development in NYS fit into four categories of economic development funding. They include industry-based, project-based (REDC), place-based - brownfield

³⁴ The Empire State Development Corporation (ESD) is an umbrella organization that encompasses the New York State Urban Development Corporation and the New York Job Development Authority. The New York State Department of Economic Development (DED) operationally has merged into ESD. Napoli, Thomas P. 2015. "Public Authorities by the Numbers: Empire State Development Corporation." February. https://www.osc.state.ny.us/reports/pubauth/PA_by_the_numbers_ESDC_2_15.pdf

cleanup subsidies and legacy costs for Empire Zones, and person-based subsidies. In 2016, New York State spent a total of \$5.0 billion (an amount equal to 5.5 percent of State Operating Funds) on these four economic development areas.³⁵ Table 8 details the spending for 2016. The largest share of state spending, \$1.8 of the \$5.0 billion, supports tax incentives awarded to particular industries or industry-based activities, of which the largest two are sales tax credits to support R&D and income tax credits to produce film, advertisement, and television shows.

Spending on place-based development programs amounts to \$729 million. Brownfield cleanup subsidies and legacy tax forgiveness for businesses in the expired Empire State Zone program comprise two-thirds of place-based spending. Spending on the discontinued Empire Zone program will decline over time as the State fulfills its legacy obligations. The State devotes the smallest share of its total development spending on place-based subsidies.

³⁵ Citizens Budget Commission calculations of economic development spending. The figure also includes person-based subsidies of approximately \$1.3 billion.

Table 8**(Figures in Thousands of Dollars)**

Industry Based		Place Based		Person Based		Project Based	
Sales Tax Credits for Production and R&D	\$547	Brownfield Tax Credits	\$131	Earned Income Tax Credit	\$1,073	Empire State Development	\$1,135
Film & Production Tax Credits	\$570	Empire Zones (legacy)	\$359	Childcare Tax Credit	\$220	Department of Economic Development	\$79
Agriculture/Horse Breeding Funds and Credits	\$204	Other Development Authorities	\$187	Workforce Training			
NYSERDA/NYPA	\$158	Others	\$48				
Investment Tax Credits	\$135	START-UP	\$4				
Commercial Airlines Tax Exemptions	\$115						
Excelsior	\$22						
Others	\$50						
Total	\$1,800		\$729		\$1,293		\$1,214

Sources: Citizen Budget Commission staff analysis of various state documents.

Person-based programs account for \$1.3 billion and include the State's Earned Income Tax Credit (EITC) at \$1.1 billion, the childcare tax credit and workforce training. The State EITC and childcare tax credit depend on participation in the workforce and offer direct tax credits to low-wage employees. Total state-supported spending on workforce training in 2016 is unavailable. Of the total reported person-based spending, EITC spending accounts for more than 80 percent.

Since 2011, NYS has placed more emphasis on project-based development, and that spending totals \$1.2 billion in 2016. This amount includes spending on "mega deals," as well as subsidies, grants, or other concessions conferred on start-ups and business expansion projects through the REDC process. The Empire State Development Corporation and the NYS Department of Economic Development review the projects that the REDCs propose for funding and then allocate funds to selected projects. The State has allocated on average \$750 million annually through the REDC process since 2011.

IV. Evaluation of Economic Development Programming

State of the art evaluation studies use experimental research designs to measure program effects on job growth or other outputs. These evaluations estimate how much of the observed job effects are attributable to the tax incentive, enterprise zone, or other programs, and how much of the observed effects would have occurred without the programs. Such studies typically require data that are collected for several years and record jobs created, recipients of jobs, earnings, investments, and other indicators for areas exposed to a program and comparable data for similar areas not exposed to a program. Then, the outcomes in the non-treated areas are compared to the outcomes in the treated areas. These data are costly to obtain and rarely available for economic development programs.

When programs are evaluated, they generally use available evidence to judge program performances, and Appendix Table 2 lists the advantages and disadvantages of NYS's major economic development programs. Available program evaluations indicate four key weaknesses:

1. Programs are costly;
2. They are not well designed;
3. Transparency for program effects is limited, but where data exist, many programs do not produce enough jobs.
4. REDCs fund projects that are not always aligned with each region's strategic priorities, and the funding is spread too thinly across too many projects.

Poorly Designed and Costly

NYS's economic development spending provides government funding before business investment and tangible project progress occurs. In addition, a significant amount of economic development spending is discretionary, rather than flowing through programs with defined eligibility criteria. Often, project goals, such as the number of jobs or size of the investment made, are not well defined, and when projects create few jobs, the cost per-job cost can be particularly high. Discretionary grants are also the least likely to include robust reporting requirements.

Bartik provides more evidence on the costs of states' tax incentive programs.³⁶ He reports that in 2015, New Mexico, New York, and Louisiana, in that rank order, grant the highest value of tax incentives among the 33 states he included in his report. For each of the 33 states, he measures gross and net taxes as a percent of export-based industry value added in 2015. By these measures, the gross tax figure for NYS

³⁶ Bartik, Timothy J. 2017. "A New Panel Database on Business Incentives for Economic Development Offered by State and Local Governments in the United States." Prepared for Pew Charitable Trusts. W.E. Upjohn Institute for Employment Research, February. <http://research.upjohn.org/reports/225>. Pages 58-59.

stands at 4.65 percent, whereas net taxes (after incentives) are 1.12 percent of export-based industry value added.³⁷ None of the 33 states has a lower net tax rate than NYS, and some of the fastest growing states – Texas, California, and Massachusetts – have net tax rates that range between 3.79 to 4.12 percent of value added.

Moreover, New York leads all states in dollars spent on mega deals.³⁸ There have been a few high-profile failures, including a film hub near Syracuse and a factory for an LED manufacturer that backed out when the factory was nearly complete. The State also built a \$750 million factory in Buffalo for solar panel manufacturer SolarCity, which was acquired by Tesla. Production is currently below target levels and hiring has been slow.³⁹

³⁷ According to NYS figures reported in Bartik, a substantial share of the tax incentive spending went to the film industry.

³⁸ Mattera, Philip, Kasia Tarczynska With Greg LeRo. 2013. “Megadeals: The Largest Economic Development Subsidy Packages Ever Awarded by State and Local Governments in the United States.” June 2013 data updated to 2018 <https://www.goodjobsfirst.org/megadeals>

³⁹ Tim Knauss, “Sora walks away from \$90M factory that NY built; \$15M more brings new tenant” (December 20, 2017), Syracuse Post-Standard, www.syracuse.com/news/index.ssf/2017/12/soraa_walks_away_from_90m_factory_that_ny_built_but_15m_more_brings_new_tenant.html; Jesse McKinley, “New York Spent \$15 Million to Build a Film Hub. It Just Sold for \$1.” (June 1, 2018). *New York Times*. www.nytimes.com/2018/06/01/nyregion/new-york-film-hub-sale.html; Salvador Rodriguez and Nichola Groom, “Inside Tesla’s troubled New York solar factory” (August 8, 2018), Reuters, www.reuters.com/article/us-tesla-solar-insight/inside-teslas-troubled-new-york-solar-factory-idUSKBN1KTODU.

Limited Evaluation, Transparency and Effectiveness

Requirements for measuring projects' progress and reporting outcomes differ from program to program, leading to varying levels of transparency and making it difficult to compare the effectiveness of various project investments.⁴⁰ Some programs do not report information on the number of full-time (or full-time equivalent) jobs projected and created.⁴¹ Program evaluations do not regularly take place, and there is little information on effectiveness.⁴² Evidence from academic research suggests that New York's film tax credits and recent discretionary mega deals do not create permanent, high-wage, export-based jobs.⁴³

Funding Spread Too Thinly

While NYS's criteria and regional priorities guide REDC project requests and funding, NYS spreads funds across many projects in ten REDCs and across many projects with different objectives within REDCs.⁴⁴ Table 9 lists the number of funded projects by REDC and the funds spent on average for projects in 2017. NYS funded an average of 56 economic development projects per REDC in 2017, and invested on average \$382,077 per project, a level of funding likely too low to have a significant economic impact.⁴⁵

⁴⁰ Evaluation reports do not describe evaluation methods and data. Rather, they typically describe the program and mention jobs created. See, for example, Empire State Development, "The Business Incentives Report." https://cdn.esd.ny.gov/Reports/2015_ESD_Business_Incentives_Report.pdf

⁴¹ The film and production tax credit require the recipients to report the number of hires and eligible work hours, with no distinction between workers hired for two days and those employed for six months.

⁴² New York is categorized as "trailing" among states in evaluation of tax incentives. See Goodman, Josh and Jeff Chapman 2018. "State Tax Incentive Evaluation Ratings" (October 26), The Pew Charitable Trusts, <https://www.pewtrusts.org/en/research-and-analysis/articles/2017/05/03/state-tax-incentive-evaluation-ratings>.

⁴³ Thom, Michael. 2016. "Lights, Camera, but No Action? Tax and Economic Development Lessons from State Motion Picture Incentive Programs." *American Review of Public Administration* (June 5): 1-23, <http://arp.sagepub.com/content/early/2016/06/03/0275074016651958.full.pdf>.

⁴⁴ Dague, Jamison, Tammy Gamerman, and Elizabeth Lynam. 2015. Bigger Not better: New York's Expanding Economic Development Programs." Report prepared by Citizens Budget Commission. February. <https://cbcny.org/research/bigger-not-better> and Edwards, Riley and David Friedfel. 2016. "Increasing without Evidence: NYS Economic Development Spending Update" Report prepared by Citizens Budget Commission. September. <https://cbcny.org/research/increasing-without-evidence>

⁴⁵ Note REDC receive and administer grants through several funding mechanisms and agencies; many are not explicitly economic development but instead dedicated to other purposes, for example, infrastructure development and enhancement of cultural activities.

As shown in Table 9, a significant share of projects in each region are not linked to state or regional strategic priorities. Furthermore, it is difficult to know the outcomes and success of projects for any of the REDCs projects; the quality of project reporting varies by region, and tracking the progress and outcomes of individual projects across time is particularly difficult.⁴⁶

It may be too early in the REDC cycle to expect substantial results from REDC-led, project-based investment, as it takes time before investments yield enough economic and social data to measure project outcomes accurately. It appears, however, that scattering substantial funds for many projects in ten regions dilutes the effectiveness of the spending. Moreover, systematic data collection on REDC project outcomes is not underway at the State level.

Work force training appears lagging in regions, as well-intentioned training programs have not moved forward in a substantial way. In addition, programs launched through the REDC process do not, and likely cannot, address the large amount of poverty in many REDCs. Employment programs can increase earnings and reduce poverty, but intergenerational income mobility, research shows, requires early childhood education programs, such as high-quality, preschool programs.

⁴⁶ Jain, Rahul and Riley Edwards. 2015. "An Assessment of Performance Reporting by Regional Economic Development Councils" (November 29), Citizens Budget Commission. <https://cbcny.org/research/assessment-performance-reporting-regional-economic-development-councils>

Table 9**Project-Based Funding in 2017 by REDC**

Region	Number of Projects Awarded Funds	Number of Economic Development Projects	Average Dollars Awarded per Economic Development Project	Percent of Economic Development Projects Tied to a Regional Strategy
Long Island	98	66	\$338,124	39%
New York City	121	84	\$316,449	13%
Mid-Hudson	113	58	\$503,914	26%
Capital Region	110	52	\$477,591	52%
North Country	82	40	\$403,169	33%
Mohawk Valley	101	57	\$438,054	49%
Central New York	112	63	\$411,522	70%
Southern Tier	83	32	\$423,984	41%
Finger Lakes	110	58	\$287,495	40%
Western New York	112	52	\$278,916	75%
Total	1,042	562		
Statewide Average	104	56	\$382,077	43%

Sources: REDC Annual Reports and CBC Staff Calculations

In summary, the REDC program lacks transparency in both spending of funds and the outcomes of the investments, and where cursory data exist, the projects have not proven effective in substantially increasing regional development.

V. What can the State do to Help Depressed Regions in NYS Improve?

The Citizens Budget Commission has developed a blueprint for NYS Economic development reform.⁴⁷ Reform involves reducing NYS reliance on mega deals and industry-based tax breaks that have proved costly and ineffective.⁴⁸ Focus investments in thriving industries across New York's regions and enhance support for business creation and workforce training.

State leaders should take the following steps:

- 1. Reinforce the REDCs.** The REDC model uses appropriately a bottom-up approach that engages regional leaders and businesses in the planning process. It also builds on regional strengths and targets investments in well-paying industries. However, NYS spreads funding thinly within and across regions. To maximize development effectiveness, NYS should reduce the number of projects funded, and make larger and ongoing investments in projects with the largest potential for job creation. In addition, Empire State Development (ESD) should fund projects using clear program goals and evaluation criteria, and then track all project results over time.

Specific suggestions include:

- a. Create formal organizations within REDCs to implement the economic development planning processes.⁴⁹

⁴⁷ Edwards, Riley. 2017. "A Blueprint for Economic Development Reform." Report for Citizens Budget Commission. March 13.

⁴⁸ Wasylenko, Michael J. 2019. "Strategies to Build Economic Strength in Lagging Areas: Investment, Tax Incentives, Wage Subsidies, and Education." Center for Policy Research Working Paper 219. Maxwell School, Syracuse University.

⁴⁹ Bartik, Timothy J. 2018. "What Works to Help Manufacturing-Intensive Local Economies?" Upjohn Institute Technical Report No. 18-035. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Page 99. <https://doi.org/10.17848/tr18-035>.

- b. Focus more funding on thriving industries and on large cities or counties.⁵⁰ They generally have a greater number of better trained and educated workers. industry clusters with potential for agglomeration economies; and existing universities as well as hospitals as major employers.
- c. Align funding with regional priorities, and fund fewer projects to allow sustained investment to advance long-term goals. Transforming regional economies from manufacturing to another specialty takes a large amount of investment. sustained over a long period—20 years or more (Appendix 4).
- d. Set clearer goals and apply criteria for evaluating success.
- e. Improve data collection and track projects' progress over time.

2. Improve the design, transparency and evaluation of economic development programs in order to modify or eliminate ineffective programs. Develop a unified economic development budget that captures all costs across NYS agencies allocated to development programming; standardize job and wage metrics across all programs to facilitate comparison of the relative effectiveness of programs. Create a database that catalogues economic development spending and program performance.

In addition, improve the design of economic development programs and allocate funds to projects based on clear eligibility criteria. Match reimbursement of private investment expenses with achievement of job creation or other program targets, instead of upfront payments. Perform regular program evaluations to eliminate ineffective investments.

⁵⁰ Berube, Alan and Cecile Murray. 2018. "Renewing America's Economic Promise through Older Industrial Cities." Metropolitan Policy Program at Brookings April 2018. <https://www.brookings.edu/research/older-industrial-cities/#01073> Amior and Manning show that employment growth and decline patterns persist over time in local areas, which in turn increases the employment to population ratios. Population does leave declining areas and arrives at growing areas, but population flows more slowly than employment demand changes. They also find that the college graduate population and prime-aged males have more mobility and adjust locations more quickly than non-graduates and older workers. See Amior, Michael and Alan Manning. 2018. "The Persistence of Local Joblessness." *American Economic Review*. 108(7): 1942-1970.

In particular, the film tax credit as well as some ESD capital spending do not create permanent jobs in high value export-oriented industries. Eliminating the film and production tax credits and reducing ESD capital spending by half would free \$1.1 billion for reinvestment.⁵¹

- 3. Measure workforce skills gaps and provide retraining opportunities to workers.** Efforts at quantifying and addressing skills gaps vary by region.⁵² Worker training programs need systematic input from businesses in different regions. The NYS Department of Labor could work with businesses in each REDC to identify major skills gaps and encourage businesses and community colleges to develop customized training programs for business needs. The State University of New York (SUNY) has multiple technical and community colleges in each NYS region, and community colleges partner with businesses in some regions to develop training programs. Strengthen the approach where it already exists and implement it across all REDCs. Similarly, identify effective community college programs and scale them up to additional educational institutions. With more State funding, additional colleges in more regions can offer customized training.
- 4. Provide stronger support for entrepreneurship.** Venture capital has been and will likely remain concentrated in a few areas of the U.S. ESD could acquaint venture capitalists in New York City with upstate research facilities, as well as strengthen support for commercialization of innovations at major colleges and universities. NYS, perhaps through Federal Reserve Bank of NY, should study regional business lending patterns to identify major gaps, and where needed to encourage bank lending, NYS could provide partial loan guarantees for small businesses that show promise.
- 5. Consider enhancements of the social safety net for workers and children in chronically depressed regions.** Poverty in upstate cities and in three counties in NYC have reached record high levels both historically and compared to the average for the country.⁵³ Research indicates that New

⁵¹ N'dolo, Michael, Rachel Selsky and Amie Collins. 2019. "Economic Impact of the Film Industry in New York State: 2017 and 2018." Prepared for Empire State Development by Camion Associates, Inc. April. https://esd.ny.gov/sites/default/files/Camoin_NYS-FilmReport-2017-18.pdf

⁵² The New York Association of Training and Employment Professionals. 2018. "State of the Workforce: A Labor Market Snapshot for New York State, 2017." <https://fingerlakesworks.com/wp-content/uploads/2017/10/The-State-of-the-Workforce-Labor-Market-Snapshot-2017.pdf>

⁵³ New York State Community Action Association. 2019. "New York Poverty Report." www.nyscommunityaction.org
See also Table 7 above and sources of information for the table.

York State should redirect funds from less effective development programs to person-based subsidies, such as wage subsidies, a more generous State Earned Income Tax Credit, and workforce training to relieve poverty.⁵⁴ Other research indicates that preschool programs increase income and social mobility of children in low-income households and the effects persist for their progeny and brothers who do not experience preschool.⁵⁵ Continue to emphasize improving local education to help ensure a more vital workforce in the future. Desegregation of housing also promotes income mobility, when children under 12 years of age move to less segregated neighborhoods with better schools and social conditions.⁵⁶

6. Improve the quality of life in regions through infrastructure investment in central cities and counties. While not a primary driver of development, successful development depends to some extent on cities having viable roads, bridges, water, storm water systems and schools.⁵⁷

⁵⁴ Miller, Cynthia, Lawrence F. Katz, Gilda Azurdia, Adam Isen, Caroline Schultz, and Kali Aloisi. 2018. "Boosting the Earned Income Tax Credit for Singles: Fiscal Impact Finding from the Paycheck Plus Demonstration in New York City." Report for Manpower Demonstration Research Corporation (MDRC) September.

https://www.mdrc.org/sites/default/files/PaycheckPlus_FinalReport_0.pdf

⁵⁵ Heckman, James J. and Ganesh Karapakula. 2019. "The Perry Preschoolers at Midlife: A Study in Design-Specific Inference." National Bureau of Economic Research Working Paper No. 25888 May. <https://www.nber.org/papers/w25888>

⁵⁶ Chetty, Raj, Nathaniel Hendren and Lawrence Katz. 2016. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." *American Economic Review*. 106 (4): 855-902. Chetty, Raj and Nathaniel Hendren. 2018. "The Effects of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects I." *Quarterly Journal of Economics*. 133(3): 1107-1162 and Chetty, Raj and Nathaniel Hendren. 2018. "The Effects of Neighborhoods on Intergenerational Mobility II: County Level Estimates." *Quarterly Journal of Economics*. 133(3): 1163-1228. Hoynes, Hillary, Diane Whitmore Schanzenbach and Douglas Almond. 2016. "Long-Run Impacts of Childhood Access to the Safety Net." *American Economic Review*. 106 (4): 903-934.

⁵⁷Berube, Alan and Cecile Murray. 2018. "Renewing America's Economic Promise through Older Industrial Cities." Metropolitan Policy Program at Brookings April. <https://www.brookings.edu/research/older-industrial-cities/#01073>.

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Appendix 1

Average Wages by Occupation Category, New York State, 2010

	High Wage	Middle Wage	Low Wage
Management Occupations	\$110,990		
Legal Occupations	\$95,680		
Computer and Mathematical Occupations	\$75,040		
Business and Financial Operations Occupations	\$70,530		
Architecture and Engineering Occupations	\$70,170		
Healthcare Practitioners and Technical Occupations	\$66,800		
Life, Physical and Social Science Occupations	\$57,530		
Arts, Design, Entertainment, Sports and Media Occupations	\$56,640		
Education, Training and Library Occupations		\$52,420	
Construction and Extraction Occupations		\$49,890	
Installation, Maintenance and Repair Occupations		\$43,980	
Protective Service Occupations		\$43,760	
Community and Social Service Occupations		\$43,220	
Office and Administrative Support Occupations			\$34,040
Transportation and Material Moving Occupations			\$32,310
Production Occupations			\$30,840
Sales and Related Occupations			\$27,830
Farming, Fishing and Forestry Occupations			\$27,790
Building and Grounds Cleaning and Maintenance Occupations			\$27,710
Healthcare Support Occupations			\$27,400
Personal Care and Service Occupations			\$22,850
Food Preparation and Serving Related Occupations			\$19,990

Note: We examine employment growth in high-, middle- and low-wage occupational categories in each MSA in New York State (NYS). Average annual wages in NYS in 2010 for each major occupation are used to categorize an occupation as high-, middle- and low-wage. The median annual wage in 2010 for all occupations in NYS is \$38,880. The following table lists the high-, middle- and low-wage occupations for NYS in 2010.

Source: U.S. Bureau of Labor Statistics. <https://www.bls.gov/oes/tables.htm>

Appendix 2

Summary Evaluations of Major NYS Economic Development Programs

PROGRAM	2016 \$	DESIGN	TRANSPARENCY	RESULTS
Film Tax Credit	\$570 million	Poor - refundable film tax credits that can reduce liability below zero are overly generous.	Poor - no reporting of length of employment of people hired.	Poor - similar programs had no effect on employment, only a temporary wage effect, and no impact on gross state product or industry concentration.
ESD/DED direct capital spending	~\$1 billion	Poor - significant up-front state investment with few commitments from businesses, leading to high risk.	Poor - no consistent reporting on one-off capital projects. No transparency around selection of projects and negotiation of incentive packages.	Poor - projects such as SolarCity/Tesla & the Soraa/NexGen factory, underperformed expectations and/or required additional funding to remain viable.
START-UP NY	\$4 million	Poor - tax-free status for 10 years (especially employee PIT exemption) is overly generous.	Poor - requirement for annual report was dropped last year.	Mediocre - job creation has been modest but cost per job is low.
Empire Zones (Expired 2010)	\$359 million	Fair - once targeted to specific geographic areas but now overly broad.	Good - annual report includes full-time, part-time and FTE jobs, gross wages, capital investment made, credits claimed.	Fair - low cost per job for jobs created, but many projects received large credits despite job losses.
Upstate Revitalization Initiative	One-time competition in 2015	Poor - \$500 million awarded to each of 3 regions, based on quality of strategic plans rather than clear criteria or need.	Poor - no report on URI projects. Little transparency around selection of projects or winning regions.	Difficult to say due to poor reporting.
REDCs	NA	Mixed - regional and stakeholder-based approach, but funding doesn't follow strategy.	Poor - lack of reporting on project job projections or Little transparency around project selection and funding disbursement.	Difficult to say due to poor reporting. Regional economic outcomes are mixed.
Excelsior Jobs Program	\$22 million	Good - pays benefits based on performance, is targeted to specific industries. Eligibility criteria are clear, but have been weakened recently.	Good - quarterly reports include applicants' industry, job and investment commitments, and actual jobs created, qualified investments made and tax credits issued.	Good - low cost per job, and credits only go to companies that meet their job creation or investment commitments.
Brownfield Tax Credits	\$131 million	Good - recent reforms lowered program costs and limited the tax credit available for site redevelopment.	Good - annual report includes costs and awarded credit for site preparation, groundwater remediation and redevelopment portions of project.	Good - incentivizes the clean-up of contaminated sites.

Appendix 3

Approaches to Economic Development				
	Place-Based	Industry-Based	Person-Based	Project-Based
Rationale	Subsidizes job creation in languishing areas or with low-income workers.	Supports industries with high wages, that are export-based and/or in regional clusters.	Work-based subsidies or benefits for low-income individuals or families. (examples Earned Income Tax Credit; customized worker training)	Transformative projects expected to produce “spillover” effects.
Pros	More effective in areas with elastic labor supply and demand, where capital and labor subsidies direct resources that foster job creation and help people find work.	High-wages and export-based industries have large multiplier effects for service jobs. Building on existing regional industry clusters increases economic strengths of the region.	Income support and fostering mobility improves long-term outcomes, especially for younger children. Worker training ideally brings businesses and trainers together to ensure appropriate skills training occurs and jobs available after training completed.	Large firm locations generate a large number of new jobs and can boost productivity or related firms in the region through spillovers.
Cons	Inefficient; may relocate economic activity/jobs, instead of generating new activity; may not benefit workers who both live and work in the affected area.	Does not benefit less skilled workers, except in the creation of lower-wage service jobs. Selecting industries/firms that will succeed has mixed record.	Work-based subsidies can be expensive, if scaled to a broad population. Training makes workers more mobile.	Opportunistic rather than a coherent development strategy that will scale to all regions of a state.

Appendix 4

Transformation of the Pittsburgh Economy

A Pittsburgh Economics Study recognized in 1959 that an economy built on steel (primary metals) and banking would not sustain the Pittsburgh region. Concentrations of employment in two sectors made the Pittsburgh economy vulnerable to cyclical downturns in these industries and to external competitive forces that could threaten steel making. Industry ownership was concentrated in a few leaders; the area also had low female labor force participation. There were fewer entrepreneurs and less industry diversity than average for the nation. In fact, steel production became more efficient in other countries and threatened jobs in the U.S. steel industry. Banking competed across regions and competition increased in that industry.⁵⁸

Gradually shedding jobs in the 1970s, the region's steel production decreased at an accelerated pace in the 1980s. From 1981 to 1984, Pittsburgh lost 120,000 manufacturing jobs, mostly in steel, and the region did not recover those jobs. The region also faced major population outmigration, especially among younger age cohorts, and therefore, an aging workforce.

The 1960s study recognized the importance of a vibrant workforce: "... the Pittsburgh region's future depends to such a major extent upon retaining and attracting highly qualified and professional and technical people and business enterprisers, who are in demand everywhere and who command a high standard of residential amenity and cultural and professional opportunities."

⁵⁸ Briem, Christopher. 2007. Program in Urban and Regional Analysis, University Center for Social and Urban Research, University of Pittsburgh, November 27, 2007. Chinitz, Benjamin. 1961. "Contrasts in Agglomerations: New York and Pittsburgh" *American Economic Review, Papers and Proceedings* 2 (May): 279 - 289. "Region with a Future." Volume 3 of the Economic Study of the Pittsburgh Region. 1964.

The State of Pennsylvania examined strategies to grow non-manufacturing industries across the state. Pennsylvania rejected the “smokestack chasing” strategy that sought to attract or retain large employers using tax incentives, land grants and other incentives. It also avoided the 1980s enterprise zone programs.

The State of Pennsylvania 1983 launched the Ben Franklin Partnership program in 1983 with four areas - Pittsburgh, Philadelphia, the Lehigh Valley and University Park (Pennsylvania State University) - as anchor locations for the partnership program. The Program emphasized Technology-Based Economic Development (TBED) and sought to exploit its comparative advantages in health sciences and engineering anchored in its two large cities and in education around major universities - Carnegie-Mellon University, University of Pittsburgh, Pennsylvania State University and the University of Pennsylvania, among others.

In 2001, Pennsylvania invested a portion of funds that it and other states received from a tobacco settlement lawsuit in Life Sciences Research – \$64 million per year for the next 25 years.⁵⁹ In 2002, Pennsylvania funded a Greenhouse Life Sciences initiative for \$100 million in three locations - Pittsburgh, Central PA and Southeastern PA to support public/private partnerships (government, businesses, universities and other partners).⁶⁰ Pittsburgh and other areas of the state had technical expertise in their labor forces, and had talent at its universities. These features in Pittsburgh helped it attract advanced manufacturers, as well as advanced biotechnology and energy sectors as areas for development and growth. Some other regions had similar legacy workforces.

⁵⁹ Act 77 State of Pennsylvania.

<https://www.legis.state.pa.us/cfdocs/legis/li/uconsCheck.cfm?yr=2001&sessInd=0&act=77>

⁶⁰ Pittsburgh also has a history of life sciences research. The Salk vaccine originated at the University of Pittsburgh in 1952.

The University of Pittsburgh medical center is now the largest employer in Pittsburgh followed by the University of Pittsburgh. Pittsburgh remains a major center for financial activities. The region also has the largest share of nuclear engineers in the United States. It has developed a diversified energy production system for coal, natural gas, nuclear, solar and wind power.⁶¹

A recent Brookings report acknowledges the region's transformation and points to its weaknesses.⁶² It and other publications caution that the region does not have enough workers to attract startup firms to commercialize the area's advanced research prototypes and manufacture them for sale.⁶³ It recommends investing in education, workforce development, infrastructure, and neighborhood revitalization. Also of note, the poverty rate in the City of Pittsburgh is 23.8 percent, which is significantly higher than the Pittsburgh MSA (10.8 percent) or the state (12.5 percent).⁶⁴

Does Pittsburgh's experience scale to other locations? Pittsburgh has a relatively large population size, (2.3 million in the MSA) and two high quality universities. It had universities with foci on health and engineering sciences. The State committed long-term (25 years) investment funds for life sciences. Other states and regions might adapt these strategies to their circumstances. Turning an economy around takes decades even when the strategy embraces existing regional economic strengths.

⁶¹ Pittsburgh's natural gas production is efficient compared to other areas, as the Pittsburgh area lies in the Marcellus and Utica shale ranges and the gas deposits in the Pittsburgh region are about 20 feet underground, as opposed to much greater depths in New York and other locations in Pennsylvania.

⁶² Andes, Scott, Mitch Horowitz, Ryan Helwig and Bruce Katz. 2017. "Capturing the next economy: Pittsburgh's rise as a global innovation city." Brookings Institution September. https://www.brookings.edu/wp-content/uploads/2017/09/pittsburgh_full.pdf

⁶³ Vitale, Patrick. "The Pittsburgh Fairy Tale." 2017. Jacobin Magazine. June. <https://jacobinmag.com/2017/06/pittsburgh-tech-new-economy-manufacturing-inequality>

⁶⁴ Poverty Information: <https://www.statista.com/statistics/205691/poverty-rate-in-Pennsylvania/>.