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CHOOSING WHAT WORKS:

Let's Build an Innovation Economy for All

BY PATRICK McHUGH, ECONOMIC ANALYST

North Carolina faces an important choice about which path to choose to create jobs and strengthen the state's economy.

One path centers on Governor McCrory's oft-stated aim to make the state a research and commercial hub that can rival California's Silicon Valley in California and Boston's Route 128 corridor. The other path would make North Carolina's key selling points low taxes and lax regulation. So the question becomes will North Carolina's "business model" be to compete on quality or on price? The answer will say a lot about what kinds of opportunity the state offers businesses and residents in the years to come.

Governor McCrory has called for North Carolina to become the third "vertex of innovation" in his State of the State address and other public appearances. Of course, he is not the first leader to see a place for North Carolina in the tech-driven innovation economy. The Research Triangle Park is one of the closest analogs to Silicon Valley and the Boston area that the south has to offer. The Governor's proposals would build on decades of public investment in education as well as partnerships between research institutions and the private sector.

Meanwhile, the state continues to reduce taxes. For those who favor this as a strategy for economic growth, the 2013 tax cuts were only the beginning. If we really want to outdo our neighbors, the argument goes, we need to keep slashing income taxes–especially for the wealthiest North Carolinians–and asking less of large, profitable multinational corporations when it comes to paying for public services. The budget proposed by the Senate this year extends this line of thinking, offering particularly generous tax cuts to large corporations.

North Carolina must choose to Compete on Quality or Price

The decision about whether to compete on price or on quality is one that businesses the world-over wrestle with. It's the difference between selling commodities like toasters or the newest wave of customized cell phones. If you're in the toaster business, price is an all-consuming priority because there are lots of companies that can make essentially the same product, so consumer price drives sales. On the other hand, the cutting edge of technological innovation is about offering quality, a good or service that only a few sources can provide, which makes it possible to sell at a premium. Because these two strategies require very different types of investments, companies are generally forced to choose one path or the other.

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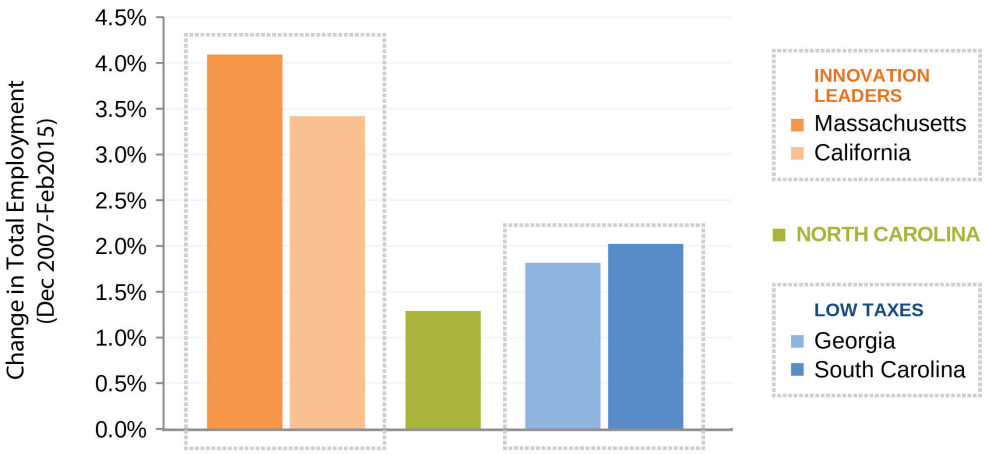
North Carolina has to make that same choice. The low-tax strategy is about competing on price–making the state a cheap place to do business in the short run by reducing companies' taxes. The innovation-driven strategy is about enabling North Carolina workers and companies to produce quality goods that cannot be found everywhere. Cutting taxes has already scaled back precisely the kinds of investment that are needed to compete with the Bostons and Silicon Valleys of the world. Support for the University of North Carolina system has been repeatedly cut over the past several years. The same is true with regard to retraining workers whose skills are out of date. Other important initiatives that build bridges between research institutions and the private sector are on the chopping block.

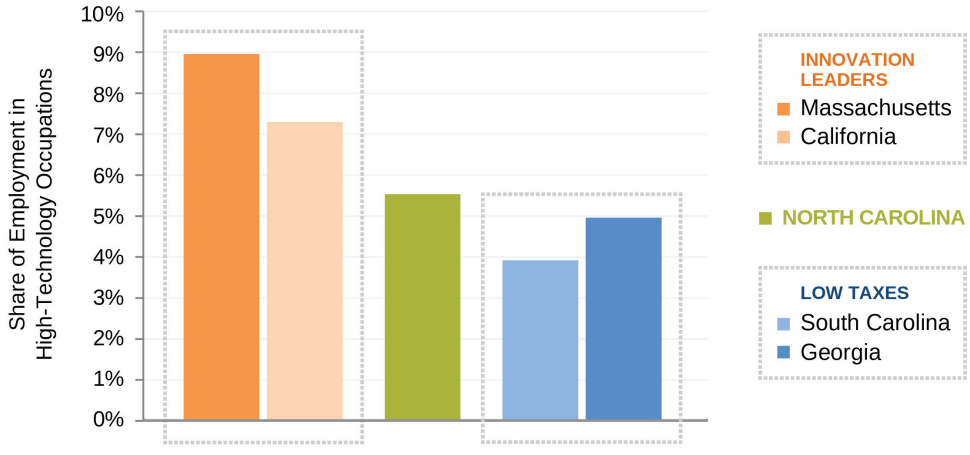
Another round of cuts, as proposed in the legislature this year, would make it impossible to reach the goal that Governor McCrory has been laying out. Competing on quality requires significant public-sector support, calling into question whether the state can both enact more tax cuts and hope to succeed in the innovation economy.

FIGURE 1: More Robust Recovery from the Great Recession in Innovation States



SOURCE: Analysis of *Bureau of Labor Statistics*, Current Employment Statistics.

FIGURE 2: California and Massachusetts Generating More High Tech Jobs



SOURCE: Information Technology and Innovation Foundation. *2014 State New Economy Index.*

Which strategy holds the greatest economic potential for North Carolina? It is informative to take a look at states that have been identified by supporters of both the low-tax and innovation-driven strategies as examples to emulate. Governor McCrory has already identified California and Massachusetts as the other "vertexes" of innovation. On the other hand, proponents of the low-cost model regularly point south to Georgia and South Carolina as leaders to follow.

Innovation Centers Posting Better Economic Results

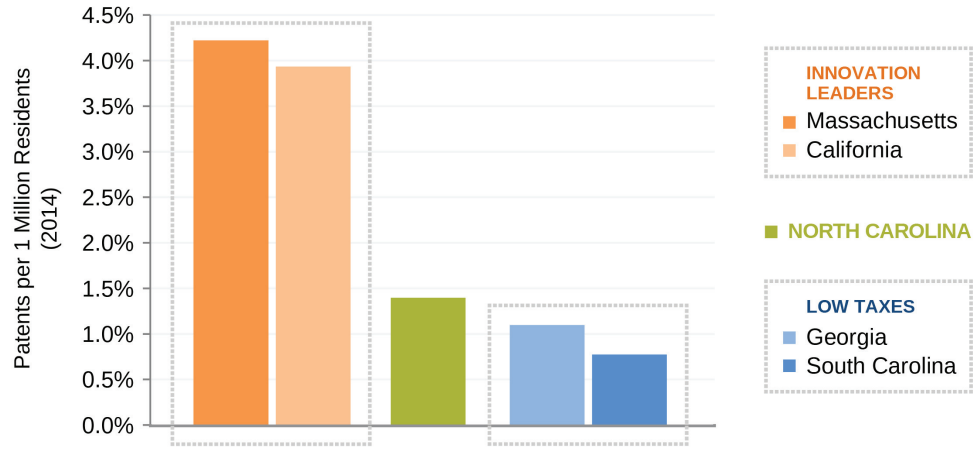
Employment results since the start of the Great Recession make a strong case for a focus on investment and innovation. California and Massachusetts have both done much better than North Carolina and our neighbors to the south. Massachusetts had

4.1% more jobs in February of 2015 than it did at the end of 2007, more than double the growth for South Carolina and Georgia.[1] Even California, which was slammed particularly hard by the collapse of the housing market, has managed to get employment back to 3.4% above the pre-recession level. Our neighbors to the south have outpaced North Carolina's economic performance over the past seven years, but no state in the southeast has kept up with California or Massachusetts.

The only states to post stronger job growth than California and Massachusetts since the start of the Great Recession are those with major oil or gas resources, major federal government employment, or both.

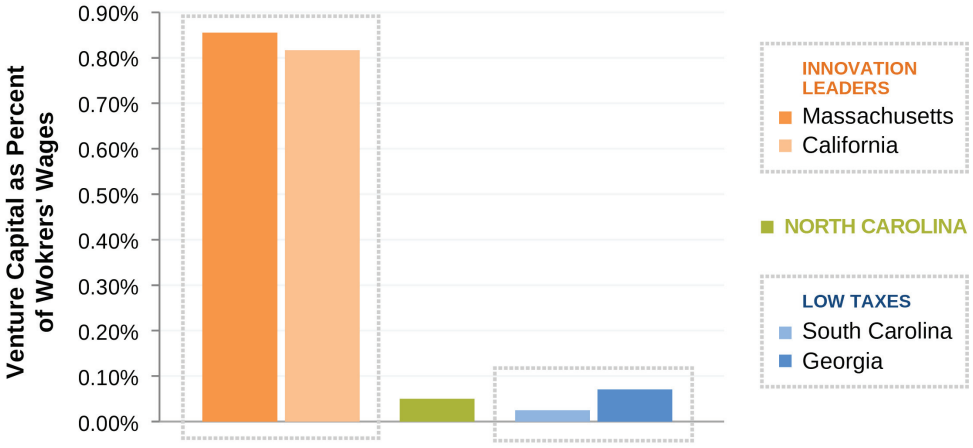
Given the prevalence of hyperbole in many economic policy conversations, it's worth asking whether the reality of innovation in California and Massachusetts actually lives up to the hype. The Information Technology and Innovation Foundation, a non-partisan group in Washington DC, ranked Massachusetts the #1 most innovative state in the country, a spot that it has held since the rankings were first issued.[2] California came in at #3 in 2014, having gone as high as #2 and never lower than #7 in the last decade. North Carolina sat at #23 in 2014, just behind Georgia (#21) and ahead of South Carolina (#34). While rankings are informative, examining some of the specific markers of success in the innovation game provides deeper perspective on specific performance gaps that separate Silicon Valley and the Route 128 corridor from North Carolina and our neighbors to the south.

FIGURE 3: California and Massachusetts Generating More Patents



SOURCE: Analysis of *U.S. Patent and Trademark Office* and *U.S. Census* data.

FIGURE 4: California and Massachusetts Attracting More Venture Capital



SOURCE: Information Technology and Innovation Foundation. *2014 State New Economy Index*

First, both California and Massachusetts rely on high-tech industries for a larger share of their overall employment. Even after parts of North Carolina and Georgia have made substantial strides in

building a presence in some innovation-driven sectors, California and Massachusetts remain several steps ahead.

Successful patent applications provide another way to capture a state's level of research and development productivity. Here the gap that North Carolina would need to overcome to get on even terms with California and Massachusetts is even larger than high-tech employment. As Figure 3 shows, California and Massachusetts generated almost three times more patents per resident as North Carolina in 2014.[3]

Finally, perhaps nowhere is the gap more evident than in the relative concentration of venture capital activity. Venture capital is often the lifeblood of new innovation-driven companies, so it plays a vital role in translating good ideas into commercial products. Venture capital also serves as a marker of where the market sees the greatest potential for return on investment. The gap in venture fund activity is even more dramatic than overall employment or patents. As Figure 4 shows, venture capital activity is over eight times larger in Massachusetts and California than in North Carolina or our southern neighbors.

How Massachusetts and California Became Centers of Innovation

It's worth examining some of the key features that California's Silicon Valley and Boston's Route 128 corridor have in common. While it's impossible to replicate the precise recipe that worked in either place, their commonalities point to important ingredients for building a successful innovation economy.

- **Universities as business midwives:** Without world-class research institutions, Silicon Valley and the Route 128 corridor would not have happened. Route 128 largely grew out of the research communities at Harvard and MIT; Silicon Valley primarily owes its beginnings Stanford and the University of California at Berkeley, although other institutions of higher education played key roles in both areas. Perhaps just as important as world-class research, the flagship institutions in both regions developed a culture of commercialization. Leading researchers at these schools encouraged young scientists and engineers to spin off businesses that could transform advances in basic research into commercially viable products.
- **Public support for research and development:** Government funding, through both research grants and contracts, were instrumental to the birth and growth of both regions. Particularly before the advent of personal computing, government agencies such as the Department of Defense, NASA, and the Census Bureau created much of the demand for the nascent technologies that would ultimately transform how we all live. Consumer and business demand ultimately eclipsed government contracts as the key business drivers, but much of the cutting edge research and development still rely heavily on public sector support.
- **Venture capital:** Venture capital could be considered one of the financial inventions of the Route 128 corridor and Silicon Valley. Venture capital is generally early-stage investment, usually accompanied by a share in a company's ownership and decision-making. Often, venture capital is the first option for a fledgling company that lacks the cash flow to secure bank loans or conduct a successful public stock offering. It requires investors with a high tolerance for risk and expertise in transforming ideas into viable products.
- **Global communities:** It is striking how many of the technologists and entrepreneurs that put Silicon Valley and the Route 128 corridor on the map were born outside of the United States, a trend that continues today. It is no accident that the two greatest

technology hubs in the country grew up around cities that had long been leading gateways for new immigrants to the United States. Long before other industries globalized, academic and business leaders in Silicon Valley and Route 128 were scouring the globe for the best talent.

- **Highly educated workforce:** Innovation is fundamentally rooted in human capital. As important as financial capital is to bring innovations to market at scale, the talent to conceive and develop new ideas is where it all begins. As such, it should come as no surprise that California and Massachusetts are near the top nationally in educational attainment. More than 40% of Massachusetts residents possess a bachelor's degree or higher, second only to the District of Columbia. California's level of educational attainment is not quite as exceptional–31% of residents hold a bachelor's degree or higher–but still stronger than North Carolina (28.4%), Georgia (28.3%), and South Carolina (26.1%).[4] The disparity is even more pronounced in the realm of scientists and engineer, who made up 5.3% of private sector employees in Massachusetts and 4.5% of all employees in California in 2012, the most recent year for which statistics are available. North Carolina, Georgia, and South Carolina all fell short of 3% of all employees in scientific or engineering fields.

- **Disruptive start-ups:** Innovation economies are turbulent spaces where current dominance is little guarantee of future strength. Before the 1950s, large companies often used economies of scale and internally-funded research shops to maintain a dominant market position. In contrast, the modern world of technological innovation often sees the "next big thing" emerge from small start-up companies. Large companies that are heavily invested in particular technologies, and have workforces with specific skillsets, often miss the signs of a new paradigm coming over the horizon. Apple and IBM missed the boat on web search optimization, Google largely whiffed on the emergence of social media, and Facebook is throwing around huge sums of money in the hope of catching the next wave.

- **High employee mobility:** The innovation economy also tends to generate a high degree of worker mobility, with employees frequently moving between firms or striking out to start their own companies. This fosters the exchange of ideas and talent, which is vital because brining new technologies to market usually requires leveraging multiple innovations from different fields of research. When workers are prevented from moving freely between jobs, as is the case when employers have more latitude to enforce restrictive non-compete contracts, the exchange of ideas can be delayed and innovations take longer to emerge.

To Boost the Economy it Takes More than Innovation-Based Development

Innovation hubs like Silicon Valley, the Route 128 corridor, and the Research Triangle create economic opportunities that extend beyond the companies and workers directly in the tech world. Technological innovation can act something like resource extraction, as value is added to the economic system and capital flows into local economies.

However, innovation-driven economies are also plagued by challenges created by wide disparities in wealth and earning power. While tech workers can command very high pay and some entrepreneurs become fabulously wealthy, innovation economies often fail to deliver significant income gains for workers outside of the technical fields. Partially as a result, income inequality has surged more in California and Massachusetts over the last several decades than in many other parts of the country. The top 1% of earners captured 85.4% of the income growth in California during economic expansions since 1979, compared to the national average of 64%.[5] Unfortunately, this is not an area

where North Carolina has been far behind the tech leaders, with the top 1% capturing 73.9% of the income gains over the same period.

Growing disparities of wealth often make it very difficult for workers who have not seen significant wage gains to keep up. Silicon Valley and the Boston area have seen the cost of living, particularly in housing costs, balloon in recent decades, often pricing out residents who do not work in high technology fields.[6]

As such, an innovation-based growth strategy can't stand on its own. The gaps created by an innovation economy need to be addressed, whether through pairing an innovation approach with other strategies that create a wider range of employment opportunities, directly narrowing wage gaps through effective living wage laws, mandating affordable housing, investing in accessible public transportation, or ensuring access for affordable health care.

Policy Lessons for North Carolina

The low-cost model is not the wise course for our state. Competing on quality allowed California and Massachusetts to rebound from the Great Recession faster and will likely set them up for success going forward. As more and more of the U.S. economy transitions into an innovation-driven foundation, competing on price alone just isn't enough.

As such, the Governor's goal of seeing North Carolina join California and Massachusetts at the cutting edge is a very good sign. While we cannot expect to replicate the exact formula that worked in Silicon Valley and along Route 128, those examples contain some vital policy lessons for North Carolina:

- **Adequately Fund Primary and Secondary Education:** Innovation is the product of improved human capital. North Carolina per pupil spending in primary and secondary education is well below the national average,[7] leaving the minds and talents of too many young people to lie fallow. While there has been some positive movement on teacher salaries in our state over the last few years, it will take more than a few thousand extra dollars per instructor to prepare North Carolina's children for an economy based on innovation.
- **Recommit to excellence in public university research and training:** The post-recession budgets have also been very tough on the state's public universities. Cutbacks were common across the country as the Great Recession raged, but have since been reversed in most states. In North Carolina, however, funding for public universities did not rebound as the economy improved. Without public universities offering an affordable education or spawning new commercially viable ideas and companies, North Carolina will likely see states like California and Massachusetts pull further and further ahead.
- **Strengthen public-private partnerships:** Strong ties between public institutions and the private sector are often the conduits that make innovation economies thrive. North Carolina provides many examples of enormously successful technology companies that were born in state-funded laboratories or emerged out of partnerships between the public and private sectors.
- **Welcome immigrants:** Successful innovation hubs draw the best and brightest minds from around the world, as evidenced by growth in Silicon Valley and the Route 128 corridor. Parts of our state have taken very important steps in recent years, but there is more to be done at both state and local levels to build a positive global reputation for North Carolina.

- **Focus on fostering entrepreneurship:** Pursuing a successful innovation strategy is not easy, in part because so much of the vital early-stage development work is done by small companies. Unlike large established firms that make their needs known to elected leaders and economic development practitioners, many smaller technology companies with enormous potential fly under the radar. With so much of the economic development effort still devoted to chasing large established corporations, we are likely missing the very firms that, with the right kinds of support, could emerge as tomorrow's technology titans.
- **Include Everyone in Growth:** Address income inequalities and make sure that growth does not push people out of their homes and neighborhoods. Depending on the structure of the local labor market, this may entail bolstering income for non-tech workers, providing pathways into work in technology fields, and creating policies to ensure access to affordable housing, transportation, and health care.

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