

Growing Pennsylvania's High-Tech Economy: Choosing Effective Investments

Report Summary

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Introduction & Methodology

Pennsylvania, like virtually every industrialized state, invests heavily through a large number of economic development incentives and technical assistance programs to promote job creation in high-technology industries. In normal economic times, such a diverse and costly set of expenditures would certainly merit scrutiny; with the nation's deep recession depressing state and local government revenues for several years, there is far greater urgency now to ensure that such investments are effective.

This study examines the Commonwealth's high-technology economic development efforts through several lenses, and compares them to those of six primary competitors in the so-called "economic war among the states"—the neighboring states of Maryland, New Jersey, New York, Ohio and West Virginia as well as North Carolina.

The study focuses on industrial sectors that all or most of the seven states have identified as strategic targets, including synthetic fibers, pharmaceuticals and biotechnology, plastics, computers, semiconductors, electrical equipment, and transportation equipment.

In addition to case studies and program summaries, the study uses two unique analytical tools that have never been applied to Pennsylvania before and have only been used in published studies in a handful of other states.

- The first is the TAIM^{eZ} model created by Profs. Alan Peters and Peter Fisher. This is a proprietary "representative firm" tool that employs algorithms to compute how corporate taxes and incentives in an average city in each of the seven states interact with typical financial statements of actual firms in eight manufacturing sectors. The TAIM^{eZ} model builds upon extensive published work Fisher and Peters have done on the effectiveness of tax-based incentives.
- The second is the National Establishment Time Series (NETS), a proprietary database purchased for this study and analyzed by consultant Doug Hoffer, a pioneering NETS user. NETS is a longitudinal file on all business establishments created by the California-based consulting firm Walls & Associates in conjunction with the credit-reporting firm Dun & Bradstreet. Unlike annual government data, which are based on survey samples, the NETS database covers virtually every workplace in the state.

The study also explores an alternative economic development strategy that centers on high-technology skills instead of companies. Labor economists Stephen Herzenberg and Mark Price analyze the Occupational Location Quotients—the degree to which people with specific skills are geographically concentrated—for major metro areas in the seven states. Arguing that clusters of highly skilled engineers and other workers are critical competitive advantages to drive the development of technology-based firms and industries, they explore how Pennsylvania can strengthen its economy and reduce its investment risks by reinforcing those skills advantages.

This study also summarizes, but could not evaluate, the seven states' large menus of business assistance available for high-technology companies. Besides programmatic descriptions, as possible it also includes budget costs and issues raised by oversight reports such as audits.

Finally, the study provides eight detailed case studies of high-technology economic development incentive deals, one from each state and two from North Carolina. With some packages valued at more than \$100,000 per job to as high as \$1 million per job, the stories spotlight the high stakes surrounding such large, company-specific subsidies.

Using all of these tools, the study explores fundamental questions about Pennsylvania's economic development incentives, programs, and taxes—its high-tech “business climate,” if you will. They include:

- From the bottom-line perspective of a high-tech corporate balance sheet, how do the state's taxes—and its tax breaks—stack up?
- Where do most high-tech jobs come from?
- Of those high-tech jobs that leave the state, where do most go? Are many lost to other states, as some news accounts would suggest? Or is offshore job flight a bigger problem?
- What lessons can be learned from the seven states' experiences with some of their most costly company-specific incentive deals?
- Are there alternative strategies to “putting a lot of eggs in a few corporate baskets,” and what comparative advantages does Pennsylvania have in pursuing such strategies?

Pennsylvania has some significant high-technology strengths and advantages; the challenge moving forward is how to invest scarce taxpayer resources to most effectively build upon those strengths. We hope our unique analysis will inform state policy for a more prosperous future.

Executive Summary

Based upon our analysis of Pennsylvania's technology-based economic development incentives and programs, especially as they compare to those of six primary competing states, we offer the following key findings:

1. There is a very narrow range of variation among effective high-tech tax rates in the seven states, and Pennsylvania falls right in the middle.

Viewed from the balance-sheet perspective of a high-technology company deciding where to locate a new facility, Pennsylvania's corporate tax rates and incentive codes generate returns on investment very similar to those in the six competing states. Indeed, Pennsylvania is at or near the median of the seven states in every sector tested. These findings are based upon a proprietary representative-firm analysis, modeling returns on investment in each of the states for theoretical facilities with typical financial profiles.

Pennsylvania remains in the middle of the pack both before and after research and development credits are accounted for, and when facilities are located in the enterprise (or similar) zones in each state which qualify for the most generous tax breaks. Therefore, whatever differences exist between the trajectory of Pennsylvania's high-tech economy and those of its neighbors, it is doubtful that they can be attributed to the state's tax or incentive system. (Only Ohio now deviates from the group, as it eliminated its corporate income tax.)

2. High-tech job creation (or loss) is overwhelmingly driven by events within the state—not by interstate relocations.

An analysis enabled by a relatively new proprietary data set, the National Establishment Time Series (NETS), finds that Pennsylvania's interstate in-migration (or out-migration) of high-tech jobs is dwarfed (by a factor of 28 over 16 years) by the impact of business-establishment births, deaths, expansions and contractions. Whether positive or negative, the net movement of high-tech firms and jobs across the state's borders each year is almost negligible compared to the impact of in-state activity. Long term, interstate movements have been nearly a wash: over the same period, the state experienced a very small net in-migration of workplaces and a very small net out-migration of jobs.

Those facilities that do move in or out are mostly very small: more than three-fifths have fewer than five employees. Corporate and personal income tax rates play no discernible role in determining which states have received more jobs from Pennsylvania or which have sent the most jobs to the Commonwealth.

3. Globalization is the dominant issue in high-tech job out-migration.

International job flight from Pennsylvania dwarfs domestic job shifting—by a factor of 30 for the years 2001 through 2006. Especially for high-tech manufacturing jobs, globalization is the dominant issue driving Pennsylvania’s job loss caused by the relocation of work. This finding is conservatively derived by comparing the NETS data on job movements to federal Trade Adjustment Assistance data, which reports on workers officially designated as dislocated because of offshore job flight and/or imports.

4. High-tech deals can be “old economy,” costly and disappointing.

This report also includes eight in-depth case studies of high-profile, high-tech deals (one in each state, two in North Carolina). Several themes emerge: the deals can be extremely expensive both in absolute terms and on a per-job basis; most of the big-dollar incentives provided are decidedly low-tech, “old economy” sorts of tax breaks; and some technology companies (even one that admonishes us “Don’t be evil”) have gotten just as aggressive as auto companies or Wall Street banks when it comes to playing states against each other for lucrative subsidy packages.

Despite their high costs, the deals are surprisingly fragile, perhaps reflecting higher volatility in high-tech sectors. For example, North Carolina gave its costliest-ever package to Dell, but the computer assembler recently announced more than 900 jobs are headed offshore after only four years of below-projected employment. New Jersey’s deal for pharmaceutical company Altana (later Nycomed) fell far short on projected job creation. Ohio’s costly deal for biotech company Amylin rests upon one diabetes treatment facing new, deep-pocket competition. And New York’s deal worth \$1 million per job for micro-chip maker AMD (later GlobalFoundries) wavered for three years before finally breaking ground in mid-2009.

Pennsylvania’s deal for the expansion of Westinghouse Electric in Cranberry involved state enactment of a new and very expensive (but low-tech) incentive. The deal clearly plays to one of the Pittsburgh region’s sectoral strengths and supports a longstanding employer. However, taxpayers were not able to weigh whether the incentive had to be so large or whether alternative investments in the engineering and technical talent that supports the nuclear industry might have had a higher payoff.

Overall, these large high-tech companies in mature sectors resemble manufacturing companies in general; they are focused on reducing production costs, which can make them footloose, and which makes taxpayer investments in them more risky and less “sticky.”

5. Pennsylvania has distinct high-tech skills advantages that suggest an alternative and lower-risk development strategy.

If high-tech firms and industries are volatile, and company-specific deals are expensive and risky, a promising new strategy revolves around skills. Target key occupations, it suggests; identify your occupational advantages in large metro areas (as opposed to your business-density advantages) and play to those strengths.

Viewed through that lens, the Pittsburgh and Philadelphia metro areas still have strong occupational clusters that merit investments. For Pittsburgh, the greatest strengths are within engineering (especially nuclear, civil, materials, mechanical, and electrical); and biomedical (especially physicians and surgeons as well as technologists and technicians, including those in clinical laboratories and related to diagnosis). Pennsylvania is just average in its numbers of computer and math-related workers.

6. Tax-based incentives are low-impact but high-cost.

Cumulatively, our findings—especially our theoretical-firm modeling and our long-term business-establishment analysis—mesh with a large body of national evidence that finds tax reductions, exemptions or credits to be crude tools for economic development. They can only exert a very small marginal influence on corporate investment decisions because other cost factors such as labor, occupancy and other key inputs are far larger than taxes (or tax breaks).

Given this reality, for the vast majority of companies, tax breaks are windfalls, not determinants, and are therefore wasted. As well, given that Pennsylvania’s effective tax rates (after existing incentives are included) are so very close to those of competing states, its ability to stand out could only come at enormous cost. Any new tax-based incentives must also be weighed for their very real opportunity costs: fewer resources to develop skilled labor and maintain efficient infrastructure, both of which are critical to successful high-tech development (and that of all other kinds of employers).

7. Pennsylvania’s high-tech incentives appear somewhat more balanced than some states’.

Despite the enormous sums sometimes committed to individual deals, our summaries of the seven states’ high-tech incentives find that, to varying degrees, all of them support diverse kinds and sizes of companies. Although we know of no way to precisely measure these strengths, Pennsylvania, by virtue of its longstanding programs to foster early-stage companies, its new efforts to integrate its workforce strategy with its economic development system (through training consortia—“Industry Partnerships”—linked with key regional clusters), and to broadly diffuse the adoption of process technologies in manufacturing production, appears to have a more balanced approach.

That said, our findings make it clear there is room for improvement to make Pennsylvania’s high-tech job investments more effective, as outlined in our policy recommendations.

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Policy Recommendations

Based upon our findings, we offer the following policy recommendations. While these points center on Pennsylvania, they certainly apply as well in varying degrees to the six other states studied here.

1. First, Do No More Harm to the Tax Code

The quantitative evidence based on rates of return and long-term job-creation is overwhelming: Pennsylvania's tax rates and existing regimen of incentives are clearly not an issue compared to those of neighboring states. As outlined below, the state has numerous better ways to invest economic development resources than granting costly tax-break packages to individual companies, or broadly reducing corporate tax rates. And state tax policy should not be confused with federal trade policy.

2. Continue Efforts to Better Integrate Workforce and Economic Development

In recent years, Pennsylvania has become a national leader in the effort to better connect workforce development to economic development. It has done this by focusing its training investments on the skill gaps of regional industries that pay well and in which Pennsylvania has actual or potential economic advantages. Many of Pennsylvania's Industry Partnerships are in high-technology, including the biomedical industry, information technology, plastics, powdered metals, and energy.

With investments of \$20 million per year starting in 2005-06, but slashed to \$9.2 million in the state's 2009-10 budget, Pennsylvania has seed-funded over 70 sector-specific training consortia—Industry Partnerships—to identify and meet common training needs. These Industry Partnerships have brought some 6,300 business together (about \$3,000 per company per year) and trained some 73,000 workers.

Pennsylvania is, in essence, modeling how states can invest in “public goods for the 21st century” by enhancing the human capital infrastructure of technology industries. This is a more appropriate role for government than large subsidies to individual companies and a vital policy innovation given the winds of global competition.

Pennsylvania should commit long-term to its Industry Partnership strategy to “grow its own” key industries. It should also invest in additional evaluation efforts to fine tune the strategy and help Industry Partnership coordinators maximize their impact on cluster competitiveness and job opportunity.

3. Build on “Occupational Cluster” Advantages That Fuel Innovation

To complement its existing efforts to strengthen various industrial “clusters” (i.e., targeted industries), Pennsylvania should also build upon its occupational clusters—its existing high concentrations of workers in occupations that drive the innovation economy, such as engineering and biomedical occupations. Even as manufacturing employment in the Pittsburgh region has declined, for example, the region has retained great strength in specialized engineering occupations that support the steel and nuclear industries.

There is nothing automatic about the retention of a region’s high-wage occupational advantages for the long term. But with careful nurturing, the continuing asset of powerful higher education engineering institutions, and the internet making it increasingly possible for innovation workers to work at a physical distance from their clients, investing in occupational clusters may well suit metro areas such as Pittsburgh, with its moderate costs and strong quality of life.

Together with our other policy recommendation of investing more in small, local and young businesses, investing in occupational clusters is a pro-dynamism, pro-entrepreneurial strategy. And since human capital is comparatively immobile, in the event of a workplace closure or mass layoff, it reduces taxpayer risk by reducing the chance that investments will be lost from the state. It is the opposite of putting “a lot of eggs in a few corporate baskets.”

4. Grow Your Own (Existing) Employers Rather than Recruit from Other States

Recruiting companies from other states is a comparatively costly way to “create” jobs; it causes ill will among the states that see their jobs being “pirated,” and may even provoke them to retaliate. Interstate movement of jobs is an extremely small factor in the state’s high-technology economy, dwarfed on the negative side by offshore job flight, and dwarfed in both good years and bad by the net impact of workplaces growing, shrinking, being born, and dying.

The solutions are: 1) to ensure that expenditures for incentives do not starve funding for public goods that benefit all employers (and thereby make them more loyal to the state); and 2) to intentionally retool incentives and technical assistance programs (and overall spending for them) so that they reinforce ties between employers and place-based institutions (both public and private) and the ties companies in the state have with each other.

By addressing the business basics that really count in site location decision-making—skilled labor supply, infrastructure, proximity to suppliers and customers, access to technical assistance for broadly needed services—the state can ensure that the greatest number of employers derive more value from being in Pennsylvania. That, in turn enhances the likelihood of births and expansions, where all of the net high-tech job creation has been occurring.

5. Make the “Investment Tracker” a Functional Tool for Analysis

State transparency in economic development is best accomplished in two ways: through detailed online disclosure of the costs and benefits of each deal, and by a big-picture compilation and analysis of spending data, known as a Unified Development Budget (see next policy recommendation).

By online disclosure, we mean:

- annual reporting of the costs and benefits of each company-specific deal: the value of the subsidies granted, the original commitments on job creation, wage levels, benefit levels (and possibly capital investment);
- information on the address of the project site where monies are used and on the industry (the NAICS code) of the facility—so that the public can evaluate whether deals went to places and sectors that make sense; and
- information on outcomes—jobs, wages, benefits (and investment) actually delivered to date.

The Pennsylvania Department of Community and Economic Development’s “Investment Tracker” website reports on more than 240 state programs. In a 2007 report by Good Jobs First, it was ranked 12th among the states for on-line information about job subsidies (but only 23 states then had any online reporting). However, there are critical gaps in the Investment Tracker reports: information is inadequate or lacking on wages and benefits, where the money is applied geographically (i.e., does it fuel sprawl?), the industry of the

recipient company, and whether companies actually deliver jobs that were promised. The Tracker’s format also makes it difficult to download the mountain of (flawed) information into a data set for analysis.

Being inundated with too much (low-quality) data can be as disempowering as having too little. To make the Investment Tracker a functional tool, the state should improve its disclosure requirements and website to fill these data gaps and fix this download flaw.

6. Create a Unified Development Budget

To complement an enhanced deal-specific disclosure website, we also recommend a Unified Development Budget (UDB): an annual report to the state legislature which catalogs and analyzes all forms of state spending for economic development—all appropriations and all “tax expenditures” (i.e., tax credits and exemptions).

In addition to accounting for each line item, an interpretive UDB groups programs into forms of spending (e.g., workforce development, small business assistance, research and development) and also analyzes the spending trends of programs and program categories.

The point here is for legislators to see the big picture, and the patterns and trends within it, so they can effectively execute their priorities via the budget. For example, overall tax expenditures typically dwarf appropriations, but tax breaks are often poorly accounted for and therefore don’t receive the same level of scrutiny as appropriations. (They are also less likely to get audited or sunsetted.) Spending for workforce development, which should properly be considered part of economic development, is often put in another budget “silo” and is usually a tiny fraction of bricks-and-mortar subsidies.

7. Consider More Support for Small, Local and Young Businesses

Because of inadequate disclosure, it is not possible to quantitatively compare Pennsylvania with the other states on its level of support for small, local and young businesses versus its subsidies to large companies. But it is evident that the Commonwealth—through programs such as the Ben Franklin Technology Partnership and its manufacturing extension program (the Industrial Resource Centers)—has long understood the value of aiding small and young businesses.

With the aid of a Unified Development Budget, we recommend that Pennsylvania assess its actual spending priorities and consider increasing such efforts. Also relevant here is

whether program rules seek to intentionally benefit businesses that are locally based. There is a small but convincing body of evidence that locally owned businesses procure more, pay more, bank more, and participate more locally than do branch establishments of national companies. However, according to a forthcoming study on the allocation of economic development incentives in 15 states (not including Pennsylvania), there is a profound bias against locally owned businesses.

8. On Job Flight, Focus on Federal Trade Policy

Especially in manufacturing jobs, the number of jobs lost offshore is dozens of times greater than the number lost to other states. Runaway shops are a federal trade policy issue; they are not—and cannot be—much influenced by state taxes or incentives. The place to seek redress on this problem is with Pennsylvania’s congressional delegation.

Admittedly the need to replace lost jobs becomes the concern of state and local economic development officials, but the point here for economic development policy is to ensure that incentives, especially tax-based subsidies, are not misunderstood as a remedy for globalization-driven job flight. Tax breaks cannot begin to offset the cost savings companies typically enjoy by going offshore; revenue needed to sustain public goods should not be lost in a misguided effort to overcome offshoring.

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