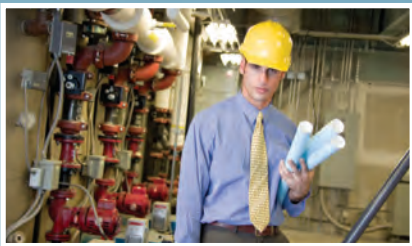
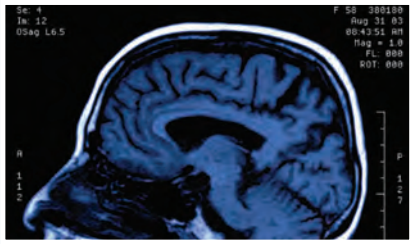


Growing Pennsylvania's High-Tech Economy: Choosing Effective Investments



a report by
Good Jobs First

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

by
Greg LeRoy

with
Leigh McIlvaine, Peter Fisher, Alan Peters
Doug Hoffer, Stephen Herzenberg
Mark Price, Merrill Goozner
and Philip Mattera

Good Jobs First
January 2010

Acknowledgments

This study was made possible by a grant from the Heinz Endowments. Special thanks to Innovation Economy Program Director Christina Gabriel.

We also thank the public officials who provided us the public records that inform our case studies. Thanks also to those public officials in some states who fact-checked the tax-code inputs for our representative firm modeling and our incentive code summaries.

Good Jobs First research analyst Tommy Cafcas supported this project with research assistance on several sections. Former Good Jobs First research analyst Karla Walter oversaw the collection of public records for the case studies and went on-site to North Carolina to collect the voluminous Dell and Google documents.

About the Contributors

Although this report combines the work of many contributors, Good Jobs First is solely responsible for its content.

Staff Contributors

Greg LeRoy (project director) is the founder and executive director of Good Jobs First and the author of two books on economic development accountability. He has been writing, training, and consulting on economic development for state and local governments, labor-management committees, unions, community groups, tax and budget watchdogs, environmentalists, smart growth advocates, foundations, and associations of public officials for more than 25 years.

Phil Mattera (five case studies) is research director of Good Jobs First and director of its Corporate Research Project. He has been doing strategic corporate research for labor, environmental, and public-interest groups nationally for two decades. Before that he spent a decade as a business journalist. He is the author of four books on business, labor and economics.

Leigh McIlvaine (state incentive summaries) is a research analyst at Good Jobs First. She holds a Masters degree in Urban and Regional Planning from the University of Minnesota's Humphrey Institute of Public Affairs. Prior to Good Jobs First, she worked in Albuquerque's planning department, for a rural NGO in India, and on a sustainable manufacturing project for Minneapolis and Saint Paul.

Outside Contributors

Fisher & Peters (representative firm analysis): Peter Fisher is Research Director of the Iowa Policy Project and Professor of Urban and Regional Planning at the University of Iowa. He received a Ph.D. in Economics from the University of Wisconsin-Madison. He has taught courses in state and local government finance, urban economics, and community development finance. Fisher's most recent book is *Grading Places: What do the Business Climate Rankings Really Tell Us?* (Economic Policy Institute, 2005). Alan Peters is Professor and Head of Urban and Regional Planning, and Director of the Planning Research Centre, in the Faculty of Architecture, Design and Planning at the University of Sydney, Australia. He received a Ph.D. in City and Regional Planning from Rutgers University. Peters' teaching has focused on economic development policy, geographic information systems, and computer visualization. Fisher and Peters have co-authored two books: *Industrial Incentives: Competition Among American States and Cities*, 1998, and *State Enterprise*

Zone Programs: Have They Worked?, 2002. Both were published by the W.E. Upjohn Institute for Employment Research. They also prepared a report, *Ohio's Business Incentive Programs: Their Value to Firms and Their Effects on Ohio's Competitive Position*, as part of the State of Ohio's comprehensive Economic Development Study in 1998. They also developed a version of the TAIM model for the Iowa Department of Economic Development, and consulted with the department on the development of a model to evaluate state incentives.

Merrill Goozner (Dell, Google, and Amylin case studies) is currently a freelance writer based in Washington, DC. During his 20 years as a journalist, he was a foreign, national and chief economics correspondent for the Chicago Tribune; he also taught business and economics journalism at New York University. His journalism career was bracketed by two five-year stints with public interest advocacy groups, including an Ohio organization that in the late 1970s criticized state and local tax giveaways to large corporations. His current work focuses on health-related issues: he is the author of *The \$800 Million Pill: The Truth Behind the Cost of New Drugs* and he writes daily at www.GoozNews.com.

Herzenberg & Price (occupational cluster analysis): Stephen Herzenberg is the 1996 founder and executive director of the Keystone Research Center. He was one of the architects of Pennsylvania's nationally recognized reform of workforce development programs. He holds a PhD in Economics from MIT. Before joining Keystone, he taught at Rutgers University and worked at the U.S. Congressional Office of Technology Assessment and the U.S. Department of Labor (USDOL). At USDOL, he served as assistant to the chief negotiator of the labor side agreement to the North American Free Trade Agreement. His publications include *Losing Ground in Early Childhood Education*, *New Rules for a New Economy: Employment and Opportunity in Postindustrial America*, *U.S.-Mexico Trade: Pulling Together or Pulling Apart?*, and *Labor Standards and Development in the Global Economy*. Mark Price has been a labor economist at Keystone since 2004 and holds a PhD in economics from the University of Utah. His dissertation, *State Prevailing Wage Laws and Construction Labor Markets*, received a 2006 Honorable Mention in the Best Dissertation Awards Competition sponsored by the Labor and Employment Relations Association. His work for Keystone includes a report profiling the state of women in the Pennsylvania workforce and *Losing Ground in Early Childhood Education*. He has taught at the University of Utah, Westminster College, Dickinson College, and Penn State University. Mark blogs for Keystone at www.papolicyblog.com.

Doug Hoffer (NETS analysis) is an independent researcher and policy analyst based in Burlington, Vermont. With a law degree from SUNY Buffalo, he performed policy analysis for the City of Burlington Community & Economic Development Office for five years. A consultant since 1993, he has authored studies on livable wages, economic development incentives, renewable energy, child care, and state pension investments. He has worked for the State Auditor, State Treasurer, State Legislature, Public Assets Institute, Peace & Justice Center, State Employees Association, Renewable Energy Vermont, Vermont Sustainable Jobs Fund, High Road Vermont, and various private companies.

About the Advisors

This project was advised by senior staff of seven non-profit state policy groups, however Good Jobs First is solely responsible for its content.

Neil Bergsman directs the **Maryland Tax and Budget Policy Institute**, a think tank focusing on low-income populations and public services, and a project of the Maryland Association of Nonprofit Organizations. He is the former Executive Director of Budget Analysis for the Maryland Department of Budget and Management.

Mary Forsberg and **Sarah Stecker** are the interim president and a policy analyst, respectively, of **New Jersey Policy Perspective**, a policy research and strategic communications group seeking a New Jersey economy that offers a widely-shared, rising standard of living. Forsberg is a former senior staff of the New Jersey Office of State Legislative Services; Stecker worked for a Member of Congress and a U.S. Senator.

Stephen Herzenberg is executive director of the **Keystone Research Center**, created to broaden public discussion on strategies to achieve a more prosperous and equitable Pennsylvania economy. The center works closely with the Commonwealth to reshape workforce development programs to better serve businesses and workers. Prior to Keystone, he taught at Rutgers University and worked at the U.S. Congressional Office of Technology Assessment and the U.S. Department of Labor.

Frank Mauro, director, and **James Parrott**, deputy director, lead the **Fiscal Policy Institute**, a source of independent analysis of New York tax, budget and economic issues. Their decades of experience with economic development issues include Mauro's service as secretary of the State Assembly's Ways and Means Committee and Parrott's work as Chief Economist for NYC's economic policy office under Mayor David Dinkins.

Elaine Mejia directs the **North Carolina Budget and Tax Center**, a project of the North Carolina Justice Center. She is the state's most visible independent expert on state fiscal policy issues affecting low- and moderate-income people and was one among the handful of people who testified critically about the Dell deal.

Paul Miller is a policy analyst at the **West Virginia Center on Budget and Policy**, a research center that focuses on tax and budget policy. He holds a Masters in Public Administration, formerly worked as a policy analyst for the West Virginia House of Delegates, and includes economic and workforce development in his work at the Center.

Zach Schiller is the research director of **Policy Matters Ohio**. With more than two decades of research and writing about the Ohio economy as a business reporter for *The Plain Dealer* and *Business Week*, he served on the Advisory Task Force of the Ohio Economic Development Incentive Study released by the state in May 2009.

Table of Contents

Introduction and Methodology.....	1
Executive Summary.....	3
How Taxes and Economic Development Incentives Affect Returns on New Manufacturing Investment in Pennsylvania and Surrounding States.....	9
High-Tech Job Flight from Pennsylvania: Taxes, Tax Breaks, and Globalization.....	17
The Occupational Advantage of Regions: An Alternative Approach to Stimulating Economic Development.....	33
Case Studies: Eight Major High-Tech Deals.....	45
Pennsylvania Case Study: Westinghouse Electric.....	46
North Carolina Case Study: Dell.....	48
North Carolina Case Study: Google.....	55
New York Case Study: Advanced Micro Devices/GlobalFoundries.....	62
Ohio Case Study: Amylin Pharmaceuticals Inc.....	66
Maryland Case Study: Battelle Memorial Institute.....	72
New Jersey Case Study: Nycomed.....	76
West Virginia Case Study: Kureha.....	78
Policy Recommendations.....	81
Notes.....	86

Appendices available online at www.goodjobsfirst.org/PAhightech.cfm

Appendix A: State High-Tech Economic Development Incentive Programs

Appendix B: Tax Model Methodology

Appendix C1: Net Gains and Losses in High Technology Establishments and Jobs, by
Four-Digit Standard Industrial Code

Appendix C2: Wages of High-Technology Pennsylvania Industries with Net Jobs Gains
and Losses

Appendix C3: Pennsylvania Trade Adjustment Assistance Certifications for
Pennsylvania High Tech firms, 1990 – 2008

Appendix C4: Standard Industrial Codes (SICs) Used in the National Establishment
Time Series (NETS) and Trade Adjustment Assistance (TAA) Analyses

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 before been applied to Pennsylvania 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, 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 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 that 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.

Policy Recommendations

Our empirical and narrative findings suggest several ways in which Pennsylvania's economic development investments can be reshaped to improve returns and reduce risks.

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

The quantitative evidence 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 regarding job flight offshore, state tax policy should not be confused with federal trade policy.

2. Continue Efforts to Better Integrate Workforce and Economic Development

Pennsylvania is ahead of the curve in connecting its workforce investments to the skills gaps of regional industry clusters that pay well and in which Pennsylvania has actual or potential economic advantages. In more than 70 Industry Partnerships, many in high technology, Pennsylvania has cost-effectively brought some 6,300 business together to identify and meet common training needs.

Pennsylvania is, in essence, modeling how states can invest in “public goods for the 21st century”—the human capital infrastructure of technology industries—a more appropriate role for government than large subsidies to individual companies and a necessary innovation given the winds of global competition. Pennsylvania should commit long-term to its novel Industry Partnership strategy to “grow your 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 most critical occupational clusters—its existing high concentrations of workers in occupations, such as engineering and biomedical, that fuel innovation and high-wage job growth. Investing in occupational clusters also reduces taxpayer risk because most of the people whose skills are developed through the investments are likely to remain in the state.

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

Recruiting companies from other states is costly and provocative. It is also low-impact, since interstate movement of jobs accounts for just a fraction of one percent of the state’s high technology jobs. Better to retool incentives and technical assistance programs 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.

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

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 (only 23 states had any online reporting). But there are critical gaps in the Investment Tracker reports: for example, 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 on promised job creation. 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 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 system, 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. UDBs are intended to enable legislators to see the big picture, and the patterns and trends within it, so they can effectively execute their priorities via the budget.

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

Building on its history of assistance to small companies, 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 business that are locally based. There is a small but convincing body of evidence that locally owned businesses generate greater local economic ripple effects than do branch establishments of national companies, yet a forthcoming study of 15 states (not including Pennsylvania), will conclude that the allocation of economic development incentives is profoundly biased against locally owned businesses.

8. On Job Flight, Focus on Federal Trade Policy

Runaway shops are overwhelmingly 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. Development incentives, especially tax-based subsidies, must not be misrepresented as a remedy for globalization-driven job flight. Revenue needed to sustain public goods should not be lost in a misguided effort to overcome offshoring.

How Taxes and Economic Development Incentives Affect Returns on New Manufacturing Investment in Pennsylvania and Surrounding States

by Peter Fisher and Alan Peters

A representative-firm analysis of manufacturing facilities with high technology content was performed, modeling theoretical facilities with typical financial profiles. It finds that Pennsylvania's corporate tax rates and economic development incentive codes generate corporate returns on investment very similar to those in surrounding states and North Carolina.

This remains true when research and development credits are included, and when the theoretical facilities are located in a state's most-generous enterprise zone area. (The only anomalies are Ohio as it eliminates its corporate income tax and a Maryland program that only applies to distressed counties.)

Cumulatively, these findings are consistent with a large body of evidence that argues that tax reductions, exemptions or credits are only able to exert a small marginal influence on corporate investment decisions because other cost factors such as labor, occupancy and other key inputs are far larger.

The findings also indicate that for the vast majority of companies, tax breaks are windfalls, not determinants, and are therefore wasted. The only certain outcome of lost tax revenues are the opportunity costs: fewer resources to develop skilled labor and maintain efficient infrastructure, both of which are critical to successful high tech development.

Background: How Much Can Taxes Matter?

The ability of states to influence economic development through tax policy and tax incentives has been the subject of much research and controversy over the past 30 years. Academic researchers have generally been far more skeptical of the importance of tax differences than have public officials. The main reason for this skepticism is simple: incentives, for all their cost to state and local government, are still too small to matter much to corporate decision-makers. Typically, a firm's wage bill will be many times greater than its tax bill; for the average manufacturing firm in the U.S., payroll is about 11 times the firm's total state and local tax burden before incentives¹ and for the typical

service-sector firm, wages and salaries costs are a much larger share of the cost structure. Effectively, this means that fairly small geographic differentials in wages can easily outweigh what appear to be large tax and incentive differentials.

Some researchers have concluded, after reviewing a large body of research on the effects of state and local taxes on economic growth, that taxes have measurable but small effects on the state economy. How small? One meta-analysis concluded that the “elasticity” is about $-.03$.² This means that a 10 percent cut in taxes would produce a 3 percent increase in economic growth over what it would otherwise have been.

However, it is important to understand what this means effectively. In previous research, we have found that the average standing state and local incentive package amounts to about a 30 percent cut in the overall state-local tax rate (including corporate income, sales, and property taxes). This implies that only about 1 in 11 new jobs in the average community will actually be attributable to the incentives, even if incentives are provided for all new jobs.³ In other words, incentives “work” about 9 percent of the time, and are simply a waste of money the other 91 percent of the time. The incentives are provided, in other words, mostly to firms that would have chosen that state or locality even in the absence of incentives.

Our findings are consistent with statements of site location consultants who report that other more important factors usually determine where a company expands or relocates: i.e., the availability of skilled labor, proximity to markets, access to raw materials and suppliers, labor costs, energy and logistics costs and other key inputs specific to the firm and its products or services.

Opportunity Costs for High Technology

Even the argument that tax breaks have a small marginal effect has been challenged.⁴ The most important methodological contention is that studies on tax cuts and elasticity assume everything else is constant, including the quality of public services. Yet as a practical matter, tax cuts have to be offset either by tax increases elsewhere or by cuts in public spending, or some of both. Many things state and local governments provide—especially education and infrastructure—are themselves important to particular firms and to the economy in general. To the extent that tax cuts actually cause spending to decline for quality education and upgrades to public infrastructure, even the small positive impact described above could be eliminated.

This issue is especially salient for Pennsylvania’s high technology strategy because high tech sectors in particular demand an educated workforce, and the highly educated workers that high tech firms need to recruit and retain are likely to be especially attentive to school quality when weighing family considerations against job relocation possibilities.

The negative effects of state and local spending cuts on economic growth are important to recognize because tax incentives are expensive. There is strong evidence that they do not pay for themselves, though there are still many who claim that they do. The basic problem is this: if incentives go to every firm that meets the eligibility criteria, and 91 percent of those firms would have located in the state even without incentives, then the cost of the incentives to that 91 percent will never be offset by the eventual revenue gains from the other 9 percent.

This structural problem is aggravated by the fact that firms remain mobile—some will no longer be in the state when the incentives expire and the firms would be expected to pay the full freight in taxes. And the fiscal problem cannot be overcome by making incentives more generous. While a larger incentive package could raise the percentage of new jobs attributable to incentives, it also raises the cost of providing incentive windfalls to the majority of firms who didn't need them and didn't alter their decision because of them. In fact, the larger the incentive package the larger the net revenue loss to the state.

The Representative Firm Analysis

To assess the significance of taxes and incentives to the plant location decision in Pennsylvania and neighboring states, we conducted a representative firm analysis for eight manufacturing sectors: resin, synthetic fiber and artificial fibers; pharmaceuticals and medicines; plastics and rubber products; machinery manufacturing; computers and peripherals; semiconductors and other electronic components; electrical equipment and appliances; and transportation equipment

For each of these eight sectors, we modeled a 250-employee facility with industry-average rates of capital investment, wages, energy costs, research expenses, and profitability. Our tax model measures how state and local taxes and incentives in Pennsylvania and six neighboring states vary. Specifically, it projects how building the same new plant in each of the states would affect the company's after-tax profits.

We have developed our hypothetical firm model, called TAIM^{eZ}, over the past several years and updated it for this study.⁵ The model calculates, for each representative firm and each locality, the gross property taxes that the firm would pay each year for the first 20 years after a new plant is built in that locality, based on the value of its taxable property each year and a constant local property tax rate. The model also measures the state and local sales taxes paid on purchases of machinery and equipment and on purchases of fuel and electricity for the new plant, and the increase in state and local corporate income or gross receipts taxes paid (in the new-plant state and in other states where it is taxable), and then deducts all state credits resulting from the new plant investment. Federal income taxes are also modeled.

The result is an estimate, year by year for 20 years, of the state and local taxes, with and without tax incentives, attributable to the firm's investment, and the firm's after-tax rate of return on that investment.

We model state tax law for tax year 2008, relying on corporate financial and wage statistics for 2007. We chose 2007 both because of the availability of wage data and because we wanted corporate finances to reflect a more normal year rather than the recession year of 2008. While the tax regimes are basically those that existed for the 2008 tax year (including the income tax payable in 2009), we incorporated changes to the tax laws that have already been legislated, if they are scheduled to take effect by tax year 2010. The result is a model of 2010 tax law to the extent that it is known as of mid-2009. While there will no doubt be additional changes to 2010 tax law enacted over the next year, our findings represent the most accurate portrayal possible of the current tax system as it has already been legislated.

The model includes corporate income taxes (including taxes on net income and taxes on net worth) and gross receipts taxes, and all corporate tax incentives that would generally be claimed by a manufacturing firm building a new facility. The model also includes sales taxes on purchases of personal property (manufacturing machinery, transportation equipment, computers, furniture and fixtures), and property taxes on real and personal property. Local incentives under the discretion of cities or counties are not modeled because of the sizeable variation in such incentives and the lack in most states of any centralized data that would enable the calculation of an average property tax abatement, or an average Tax Increment Financing (TIF) incentive.

In a separate second set of data layered onto our general incentives findings, the model also captures incentives targeted geographically to economically disadvantaged places such as enterprise zones (a category that includes Pennsylvania's Keystone Opportunity Zones and New York's Empire Zones), and counties that meet distress criteria. This separate run reflects the maximum incentive package that a firm could receive if it located in such a targeted area, even including possible multiple packages from overlapping "zones."

Finally, we provide a third run that includes research and development activity credits layered onto general incentives (but excluding geographic zones). This is necessary because some states' credits are modeled on the federal tax code, which means that the credit is only for R&D expenses that exceed a baseline. In a given year, some firms will be able to claim a credit, while others will not, since R&D investments fluctuate.

Key Findings

For representative firms in eight key industries (as described in Table 1) the after-tax rates of return vary little among the states (with other factors held equal). Except for Ohio, where the corporate income tax has been replaced with a gross receipts tax, profit rates vary little when generally available subsidies are modeled, and when research and development incentives are separately layered onto general incentives. (See Table 2.)

When incentives available only in special targeted areas are added to the general incentives, New York's Empire Zone program and the One Maryland program (limited to distressed counties) lift rates of return in those targeted areas above rates in similar areas in other states.

In other words, for a typical medium-sized high tech manufacturing facility that would be considered an economic development prize (similar to those profiled in the case studies in this report), Pennsylvania's tax and incentive codes provide little appreciable advantage or disadvantage over neighboring states or North Carolina. In fact, the after-tax return in Pennsylvania is at or near the median of the seven states in every sector, regardless of the inclusion or exclusion of special incentives. Whatever differences exist between the trajectory of Pennsylvania's high tech economy and its neighbors, it is doubtful that they can be attributed to the state's tax or incentive system. Other factors are almost certainly much more influential.

The only prospective anomaly is Ohio, which shows higher after-tax returns in every sector. However, this apparently reflects the fact that we are modeling 2010 tax law. By that year, the Ohio corporate income tax will have been completely phased out and replaced with a gross receipts tax (the Commercial Activity Tax).

Among the remaining six states, however, there is generally little variation. In machinery manufacturing, for example, the median rate of return was 21.8 percent, with a range from 21.5 percent to 22.3 percent (aside from Ohio's 23.5 percent).

The addition of the research activities credit does not alter this general conclusion. For example, in the electrical equipment sector, the median rate of return was 14.6 percent, with the states ranging from 14.0 percent to 14.8 percent (again, not including Ohio's 16.4 percent).

The inclusion of spatially targeted incentives, however, reveals Maryland and New York as additional outliers, due largely to the very expensive One Maryland credit available in certain distressed counties and to New York's Empire Zone program with its extremely generous property tax credit. Among the remaining four states, after-tax rates of return still vary only modestly. In the pharmaceutical sector, the median return was 24.8 percent, with four states ranging from 24.1 percent to 24.8 percent, and New York, Ohio and Maryland somewhat higher.

Pennsylvania's position in the middle of the seven states analyzed is not surprising. The most recent estimate of state and local business taxes as a share of the state economy (as measured by gross state product) conducted by Ernst and Young for the Council on State Taxation (COST) found that Pennsylvania ranked 25th among the 50 states.⁶ Considering only the seven states in our analysis, Pennsylvania was 4th (right in the middle) according to the COST measure. The COST study (as most others) measures the average tax falling on all existing firms, not the tax—net of incentives—on new investment, but the results nonetheless support the argument that Pennsylvania's business taxes are average.

Concluding caveat: It is important to understand that these projected rates of return can only be taken as indications of the effect of taxes and incentives on rates of return, with everything else held constant. They cannot be taken to indicate the actual rate of return any specific firm would enjoy in one state versus another. Those differences would be almost completely driven by all the other factors entering into a location decision—costs of labor, land, construction, transportation, energy, and other key inputs. Because taxes are such a small share of costs, the overall pattern of rates of return will vary substantially from those shown here. The other cost factors together will invariably have a much larger impact on a firm's cost structure than do taxes or the fraction of taxes avoided through incentives.

Finally, other government policies bear directly upon these dominant cost factors (e.g., investments in K-12 education and universities, which directly affect the supply and cost of skilled labor), so economic development incentives cannot be viewed in isolation when considering how government can most effectively promote prosperity.

Table 1: Characteristics of the Representative Firms

NAICS Code	Sector Name	New Plant Fixed Assets				Percent of Sales			Operating profit: Percent of assets
		Total (\$ millions)	Percent Machinery & Equipment	Per worker (\$)	New Plant Employees	Average Wage	Energy Costs	Baseline R&D Expense	
3252	Resin, Synthetic Rubber and Artificial Fibers	\$250.0	76%	\$1,000,000	250	\$58,500	3.0%	2.1%	11.3%
3254	Pharmaceutical and Medicines	36.8	55	147,059	250	74,600	3.0	2.1	22.2
326	Plastics and Rubber Products	51.0	84	204,082	250	38,800	2.1	0.7	11.3
333	Machinery manufacturing	45.5	68	181,818	250	48,800	0.8	1.8	18.1
3341	Computers and peripherals	41.3	60	165,289	250	64,700	0.7	5.0	15.6
3344	Semiconductors and other electronic components	45.5	74	181,818	250	54,900	0.7	5.0	9.6
335	Electrical equipment and Appliances	27.2	71	108,696	250	44,400	1.0	1.4	13.7
336	Transportation Equipment	75.8	60	303,030	250	55,000	0.6	1.0	10.2

Table 2: After-tax Rate of Return on New Plant Investment

With Generally Available Incentives	MD	NC	NJ	NY	OH	PA	WV	Median
Resin, Synthetic Rubber and Artificial Fibers	5.0%	4.7%	5.5%	5.4%	6.0%	5.2%	4.4%	5.2%
Pharmaceutical and Medicines	23.6	23.8	24.3	24.4	26.2	24.0	24.0	24.0
Plastics and Rubber Products	11.9	11.5	12.2	12.2	13.4	12.1	11.3	12.1
Machinery Manufacturing	21.5	21.6	22.3	22.3	23.5	21.8	21.6	21.8
Computers and Peripherals	17.1	17.3	17.7	17.7	18.5	17.3	17.4	17.4
Semiconductors and other electronic components	8.4	8.2	8.7	8.6	9.5	8.6	8.2	8.6
Electrical equipment and appliances	14.1	14.1	14.7	14.8	16.4	14.5	14.0	14.5
Transportation Equipment	18.5	18.5	19.2	18.7	50.4	18.5	18.1	18.5
Research Activities Credit Included								
Resin, Synthetic Rubber and Artificial Fibers	5.1%	4.7%	5.5%	5.4%	6.0%	5.2%	4.4%	5.2%
Pharmaceutical and Medicines	23.6	23.8	24.3	24.4	26.2	24.0	24.2	24.2
Plastics and Rubber Products	12.0	11.5	12.2	12.2	13.5	12.1	11.3	12.1
Machinery Manufacturing	21.6	21.6	22.3	22.3	23.5	21.8	21.6	21.8
Computers and Peripherals	17.2	17.3	17.7	17.7	18.6	17.4	17.4	17.4
Semiconductors and other electronic components	8.4	8.2	8.7	8.6	9.5	8.6	8.2	8.6
Electrical equipment and appliances	14.2	14.1	14.7	14.8	16.4	14.6	14.0	14.6
Transportation Equipment	18.6	18.5	19.2	18.7	20.5	18.6	18.1	18.6
Spatially Targeted Incentives Included								
Resin, Synthetic Rubber and Artificial Fibers	5.7%	4.7%	5.9%	6.4%	6.0%	5.5%	4.4%	5.7%
Pharmaceutical and Medicines	25.6	24.1	24.6	26.0	26.2	24.8	24.2	24.8
Plastics and Rubber Products	13.6	11.6	12.7	13.3	13.4	12.3	11.3	12.7
Machinery Manufacturing	23.2	21.7	22.5	23.7	23.5	22.5	21.6	22.5
Computers and Peripherals	18.3	17.4	17.8	18.4	18.5	17.6	17.4	17.8
Semiconductors and other electronic components	9.8	8.3	8.8	9.3	9.5	8.7	8.2	8.8
Electrical equipment and appliances	16.5	14.1	14.9	15.8	16.4	14.7	14.0	14.9
Transportation Equipment	20.5	18.6	19.4	22.1	20.4	19.5	18.1	19.5

High-Tech Job Flight from Pennsylvania: Taxes, Tax Breaks, and Globalization

by Doug Hoffer

An analysis of Pennsylvania's high tech business establishments and jobs, as enabled by a relatively new proprietary data set, the National Establishment Time Series (NETS), reveals that from 1990 through 2006, the state experienced a very small net interstate in-migration of workplaces and a very small net out-migration of jobs. Far and away the dominant determinants of job creation were in-state events: births, death, expansions and contractions. From 1991 through 2006, they outweighed interstate job movements by a factor of 28.

Those facilities that do move in or out are mostly very small: more than three-fifths have fewer than five employees. Most net in-migrations are from neighboring states, especially New Jersey, New York, and Maryland. Among states to which Pennsylvania had net out-migrations, retiree haven Florida received by far the largest number; Ohio and Delaware were also minor net winners.

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.

By contrast, federal Trade Adjustment Assistance data (tracking workers dislocated by imports and/or offshore job flight) make it clear that international job flight dwarfs domestic job shifting—by a factor of 30 from 2001 through 2006. Especially for manufacturing jobs, the data underscore how globalization is the dominant issue driving job loss caused by the relocation of work. Since wage savings available offshore usually exceed by many times the cost of all state and local taxes combined, when it comes to job flight from Pennsylvania, tax rates and economic development tax breaks are virtually irrelevant while trade policy is tantamount.

Though it is clearly evident that high tech employment in Pennsylvania is driven by the expansion and shrinkage of existing firms—not by interstate relocations—we found that Pennsylvania is an apparent outlier among the seven states in this study in using economic development incentives to entice companies across state lines.

Instead of using interstate lures, the data clearly suggest the state should nurture existing businesses, reinforce clusters and supply chains, and strengthen ties with universities and other place-based institutions such as the Franklin partnerships.

The “Economic War among the States” and Pennsylvania High-Tech Jobs

The “economic war among the states,” a phrase coined decades ago, refers to the use of costly tax breaks and other subsidies by some states to lure jobs from other states. It also refers to costly multi-state competitions for high-profile new facilities such as foreign-owned auto assembly plants. Pennsylvania, like other older, industrial “Rust Belt” states, is commonly viewed as a victim of this process, suffering job flight to the South and Southwest.

The economic development policy response by public officials has been an “arms race” that by the mid-1990s cost states and cities about \$50 billion a year, with states in every region of the country offering enormous deal-specific packages that routinely exceed \$100,000 per job. However, the public perceptions driving this arms race have been shaped more by occasional high-profile episodes rather than empirical analyses. This chapter seeks to carefully quantify the issue of high-tech jobs moving into and out of Pennsylvania so that policy can be improved.

NETS: Tracking All High-Tech Firms over Time

Our first analysis is enabled by the National Establishment Time Series. NETS, a proprietary database purchased for this study, is a longitudinal file on all business establishments. It is a long-term project of Walls & Associates, a California-based consulting firm, in conjunction with Dun & Bradstreet. Unlike annual government data, which are based on survey samples, the NETS database covers virtually all workplaces in the state.

(We use the word “establishments” in this chapter to reflect what NETS reports on: individual physical locations of business or industry, such as a store, laboratory or factory. Some companies operate multiple establishments in different locations and those establishments may operate in different industries. So the establishments described here include single-establishment firms that operate solely within the state as well as each Pennsylvania establishment of multi-site firms no matter where the company may have other locations or be headquartered.)

The Public Policy Institute of California, a highly regarded non-profit research group, has published a major study using NETS after assessing the validity of this relatively new data source. As PPIC notes:

Dun & Bradstreet strives to identify all business establishments, and to assemble information on them, through a massive data collection effort involving over 100 million telephone calls from four calling centers each year, as well as obtaining information from legal and court filings, newspapers and electronic news services, public utilities, all U.S. Secretaries

of State, government registries and licensing data, payment and collections information, company filings, and the U.S. Postal Service. Particular efforts are devoted to identifying the births and deaths of establishments.

The Public Policy Institute of California concluded that NETS “gives reliable measurements of [employment] dynamics and provides reliable data about the sources of employment change and growth.”⁷

Key Findings

Our analysis of NETS data for the years 1990 through 2006 finds that:

- The number of high-tech establishments moving into Pennsylvania from 1990 - 2006 slightly exceeded the number moving out (1,241 in versus 1,198 out), while the number of high tech jobs showed a slight net out-migration (24,942 out versus 22,092 in). (A list of Standard Industrial Codes used for this analysis is provided in Appendix C1.)
- The net out-migration’s effect on overall high tech employment is negligible. (Employment change is driven primarily by in-state events such as start-ups, expansions, contractions, and closures.)
- More than three-fifths of all moves into and out of Pennsylvania were by firms with fewer than five employees.
- The majority of business moves were to and from neighboring states.
- Differences in corporate or individual tax rates do not appear to explain the movement to and from other states.

The number of high tech business establishments that moved into or out of the state from 1990 through 2006 was nearly identical (see Figure 1 below). Activity peaked in 2003-2004, but has since declined. The overall impact has been microscopic: the total number of high tech facilities that moved into or out of Pennsylvania from 1990 to 2006 (2,439) is less than two percent of all the high tech establishments in the state during the period reviewed; that is, such events affected just over one tenth of one percent of high tech workplaces per year.⁸

The net change in high tech jobs from interstate moves was slightly negative (a loss of 2,850) but also very minor considering it occurred over seventeen years in a state with more than five million private-sector jobs (see Figure 2 below).

Figure 1: Interstate High-Tech Business Moves (1990 - 2006)

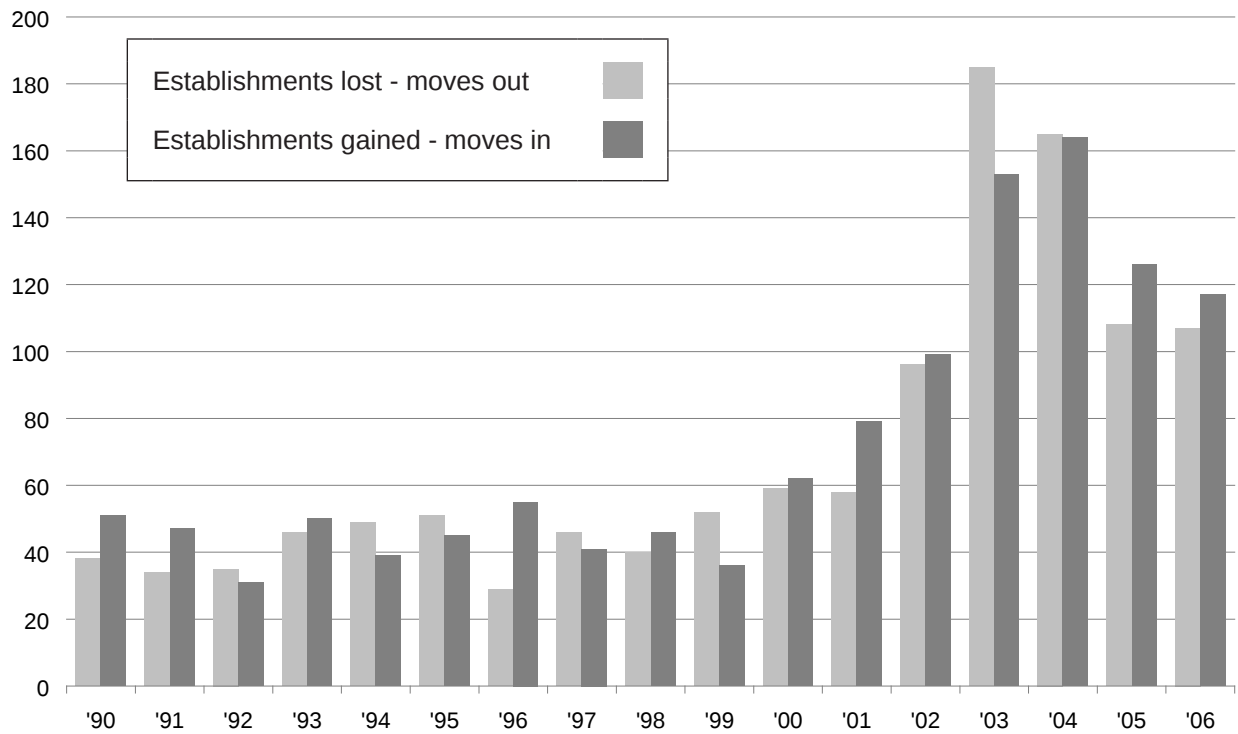
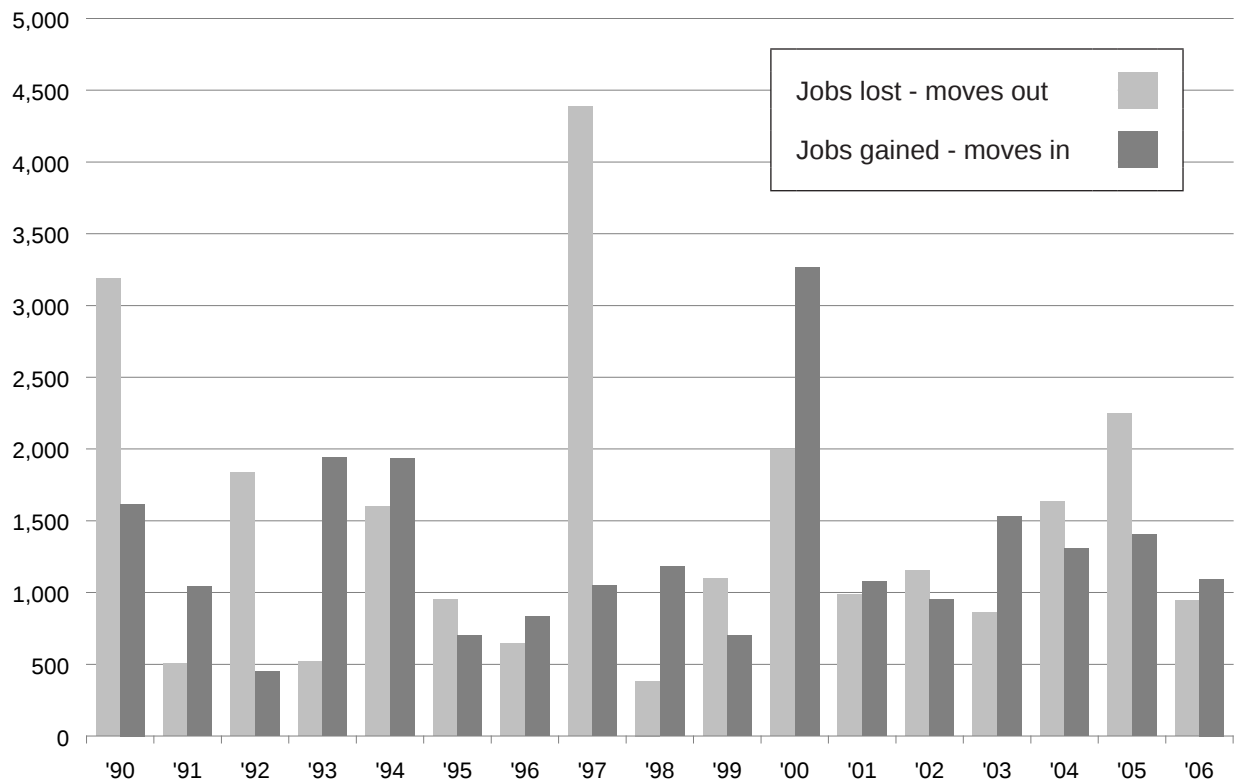


Figure 2: High-Tech Jobs Gained and Lost from Interstate Moves (1990 - 2006)



The majority of establishments that moved in and out are very small. Indeed, more than 60 percent had fewer than five employees (see Figures 3 and 4). Only four percent of all relocations involved more than 100 employees. That is, only 86 “large” high tech relocations moved into or out of Pennsylvania over the seventeen years. Of those, only fourteen had more than 500 employees (nine out and five in).

Figure 3: High-Tech Firms Moving Out of PA by Number of Employees (1996 - 2006)

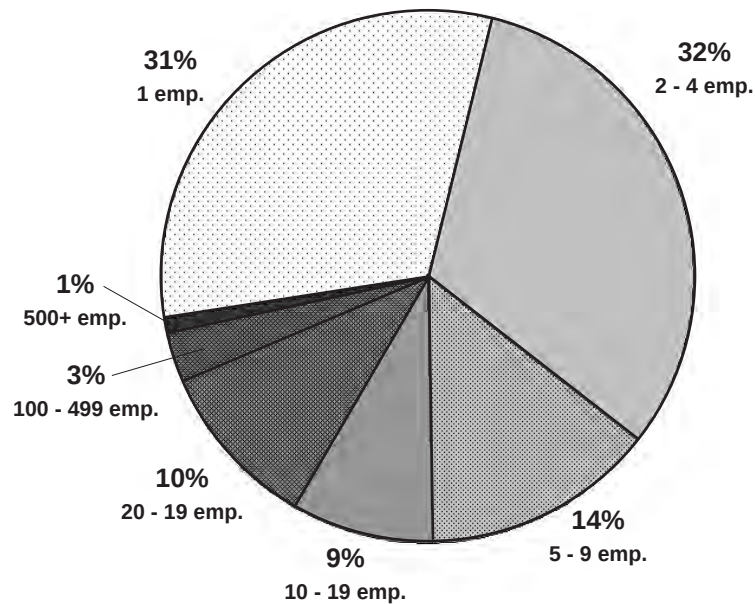
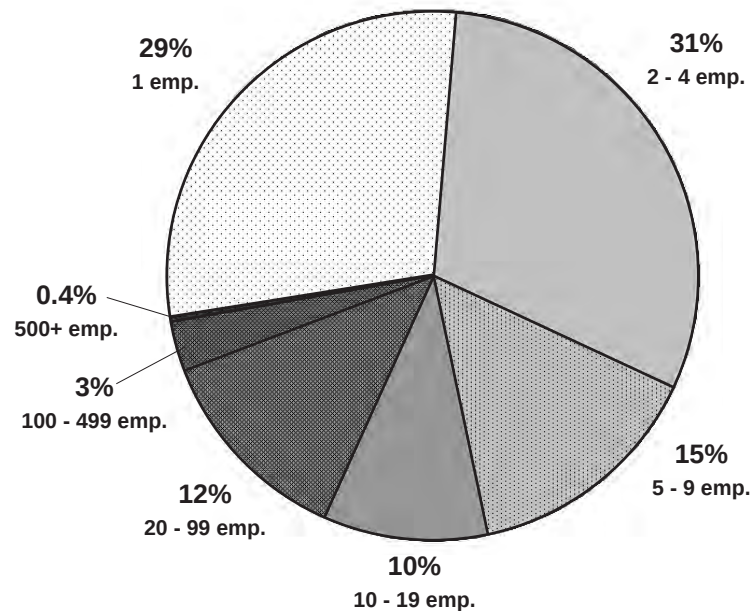


Figure 4: High-Tech Firms Moving Into PA by Number of Employees (1996 - 2006)



Winning and Losing States: What Do Tax Rates Suggest?

While emphasizing again that the net impact of interstate relocations is virtually negligible, we disaggregated the origin and destination states of the high tech facilities to explore the importance of state taxes in business moves.

The NETS data shows that 54 percent of the moves into Pennsylvania came from neighboring states (New Jersey, New York, Maryland, Delaware and Ohio). Another 16 percent came from California, Florida and Virginia (see Tables 3 and 4). All of these states have lower corporate income tax rates than Pennsylvania (see Table 5).

Table 3: Net High-Tech Establishment Gains by State (1990 - 2006)

State	Ests. Out	Ests. In	Net
NJ	239	332	93
NY	66	145	79
MD	69	91	22
VA	44	55	11
CT	18	28	10
MA	33	41	8
IL	27	32	5
OH	49	53	4
KS	0	3	3
MT	1	4	3
ID	1	3	2
TN	10	12	2
WA	6	8	2
CA	77	78	1
MO	7	8	1
NE	1	2	1
NM	4	5	1
OK	5	6	1
OR	7	8	1
PR	0	1	1
SD	0	1	0
AK	1	1	0
HI	1	1	0
MN	8	8	0
MS	1	1	0
RI	7	7	0
UT	2	2	0

Table 4: Net High-Tech Establishment Losses by State (1990 - 2006)

State	Ests. Out	Ests. In	Net
FL	166	63	-103
SC	27	5	-22
AZ	26	11	-15
TX	44	31	-13
GA	35	26	-9
NC	35	26	-9
DE	61	53	-8
AL	8	5	-3
CO	27	24	-3
IN	10	7	-3
ME	6	3	-3
VT	5	2	-3
IA	5	3	-2
KY	4	2	-2
LA	3	1	-2
NH	8	6	-2
NV	5	3	-2
AR	2	1	-1
DC	4	3	-1
MI	18	17	-1
WI	5	4	-1
WV	10	9	-1

Table 5: Tax Rates in Major Origin and Destination States

State	Corp. %	Individual %	Indiv. high bracket
PA	9.99	3.07	Flat
NJ	9	1.40 - 8.97	\$500,000
CA	8.84	1.00 - 9.30	44,815
DE	8.7	2.20 - 5.95	60,000
OH	5.1 - 8.5	0.618 - 6.24	200,000
MD	8.3	2.00 - 5.50	500,000
NY	7.5	4.00 - 6.85	20,000
AZ	6.968	2.59 - 4.54	150,000
VA	6	2.00 - 5.75	17,000
NC	6.9	6.00 - 7.75	60,000
GA	6	1.00 - 6.00	7,000
FL	5.5	0	NA
SC	5	0 - 7.0	13,350

Source: Federation of Tax Administrators

However, more than half of the high tech establishments entering Pennsylvania had fewer than five employees. Likely to be structured as sole proprietorships, partnerships, or LLCs, their owners would be more concerned with personal income tax rates. Except for Florida (which has no personal income tax), Pennsylvania has a lower top marginal rate than any major origin or destination state rate (its flat rate is only a half or a third of some other states’).

Because the other states’ rates are graduated, precise comparisons are difficult. For example, Pennsylvania has no personal exemptions so the tax applies to the first dollar earned, while the other states have numerous brackets (with rates that ascend with income) so their effective rates on business owners with incomes below the top brackets could sometimes be lower than Pennsylvania’s.

In any case, if we assume the large establishments that moved into Pennsylvania are companies subject to the corporate income tax, the data suggests that state business taxes have not prompted job flight. And although the small-firm picture is slightly ambiguous, the fact that Florida, with no personal income tax, was the number four source of migrations to Pennsylvania suggests that personal income taxes are not relevant either.

Of the relocations out of Pennsylvania, the largest destination states were New Jersey, Florida, California, Maryland, New York, Delaware, Ohio and Texas. As with in-bound moves, a significant percentage involved neighboring states (40 percent). And while the corporate tax rates are lower in these states, the difference is modest as a function of total costs. For example, the rate in New Jersey (destination for 20 percent of the relocations) is less than 1 percent lower than in Pennsylvania (representing a 10 percent savings on state taxes). If, as federal data indicate, state taxes represent about 0.2 percent of revenues for a large firm,⁹ the savings would be equal to 0.02 percent of total revenues (i.e., \$10,000 for a \$50 million business).

Given that such a small amount would be more than negated by small changes in dominant cost factors (such as labor, occupancy, materials or other large inputs), it seems unlikely that such modest tax savings could motivate a large company to move. This is consistent with what corporate site location consultants have long said: taxes, and therefore tax breaks, rarely can decide where companies expand or relocate because they are such small cost factors.¹⁰

With a few exceptions, the patterns of high tech job gains and losses follow the patterns of establishment moves (see Tables 6 and 7). The differences reflect the size of the facilities that moved to and from each state. For example, Ohio was net positive in moves (53 in and 49 out) but a few large firms moved into Ohio, so the net job impact was negative. While there were only a handful of moves to and from Maine, one large facility moved in so the jobs impact was disproportionately positive. Moves to and from California were nearly identical, but more large firms moved in so the net impact on jobs was positive.

Table 6: Net High-Tech Job Losses by State (1990 - 2006)

State	Out	In	Net
OH	3,774	777	-2,997
FL	2,826	460	-2,366
DE	3,894	1,561	-2,333
AZ	741	109	-632
NC	687	248	-439
TX	961	587	-374
SC	328	9	-319
MI	620	368	-252
MA	1,195	979	-216
GA	591	386	-205
TN	260	56	-204
NH	155	10	-145
MO	357	220	-137
IA	125	28	-97
DC	91	3	-88
CO	251	174	-77
AR	70	1	-69
HI	49	6	-43
KY	58	22	-36
OK	53	27	-26
LA	20	2	-18
VT	24	9	-15
NV	27	14	-13
IN	43	31	-12
AL	13	8	-5

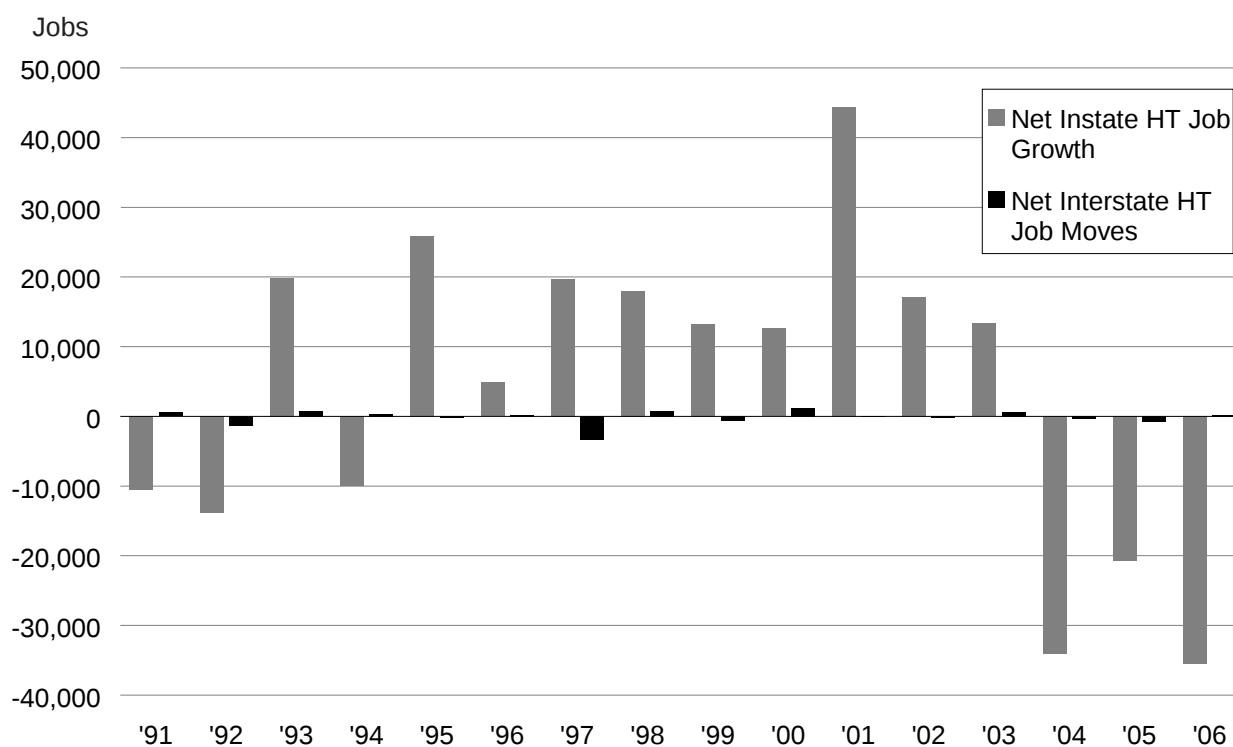
Table 7: Net High-Tech Job Gains by State (1990 - 2006)

State	Out	In	Net
NJ	3,645	6,565	2,920
ME	12	1,352	1,340
CA	1,175	2,287	1,112
NY	586	1,237	651
VA	476	1,038	562
IL	804	1,364	560
CT	180	543	363
WI	40	341	301
MD	574	783	209
KS	0	59	59
WV	29	75	46
UT	2	43	41
OR	70	103	33
MT	1	30	29
WA	35	45	10
PR	0	7	7
NM	7	13	6
MS	1	7	6
NE	2	7	5
RI	13	17	4
ID	5	7	2
AK	2	3	1
SD	0	1	1
MN	70	70	0

Births and Expansions versus Deaths and Contractions

To explore the issue further, we executed a finer-grain analysis, comparing in-state high-tech job events to interstate movements for the years 1991 through 2006 (since this is year-over-year data, 1991 is the earliest trend data available). That analysis reveals that company events within the state—the combined job growth due to establishment births and expansions minus that of deaths and contractions—dwarf the impact of interstate job moves (Figure 5). For those 16 years, the state had 10 years of high-tech job growth and six years of net job loss, for a cumulative gain of 61,756 jobs. The in-state events generated a net increase of 64,015 jobs—or 4,001 per year—while the interstate movements cost the state 2,259 jobs—only 141 per year. In other words, in-state events have been 28 times more significant than interstate movements.

Figure 5: Annual Change in Net Pennsylvania High-Tech Jobs from Instate Activity and Interstate Moves (1991 - 2006)



Offshore Job Loss; Pennsylvania's Real Issue for Manufacturing

Pennsylvania has had significant manufacturing job losses from offshore job flight and imports (approximately 23,000 jobs have been officially certified as lost this way from 1990 through 2006; see online Appendix C3). These job losses are often driven by large savings in labor costs (which dwarf state and local taxes) that can be obtained by relocating some kinds of operations. While exact figures are not available, the U.S. Department of Labor's Trade Adjustment Assistance (TAA) program provides one consistent set of data over time. (TAA certification is granted when workers are determined to be dislocated due to import competition or the offshore movement of their jobs; it qualifies dislocated workers for extended Unemployment Insurance benefits to assist in retraining and job search efforts.)

As Figures 6 and 7 make clear, the number of high tech jobs lost to offshoring is much greater than from interstate competition (more than five times greater from 1990 to 2006). There was a substantial increase in offshore job loss beginning in 2001. From that point through 2006, more than 14,000 Pennsylvania high tech dislocated workers were certified TAA-eligible. By comparison, during that same period, the net loss due to interstate moves was 457 jobs (per the NETS data). That is, international trade-related job loss was more than 30 times greater than interstate for those six years. Although there was a decline from 2004 to 2006, trade related losses spiked again in 2007 when an additional 2,500 jobs were lost.

Figure 6: Pennsylvania High-Tech Jobs Lost Annually from Overseas Moves (1990 - 2008)

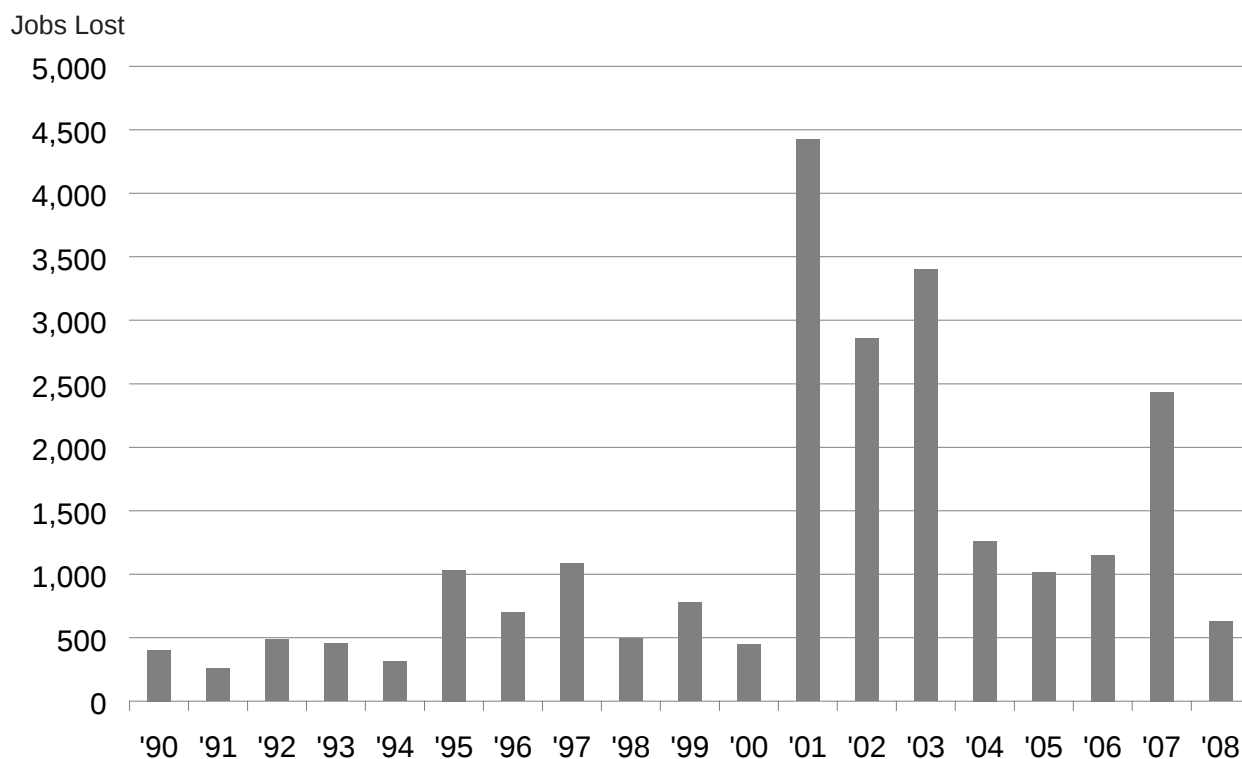
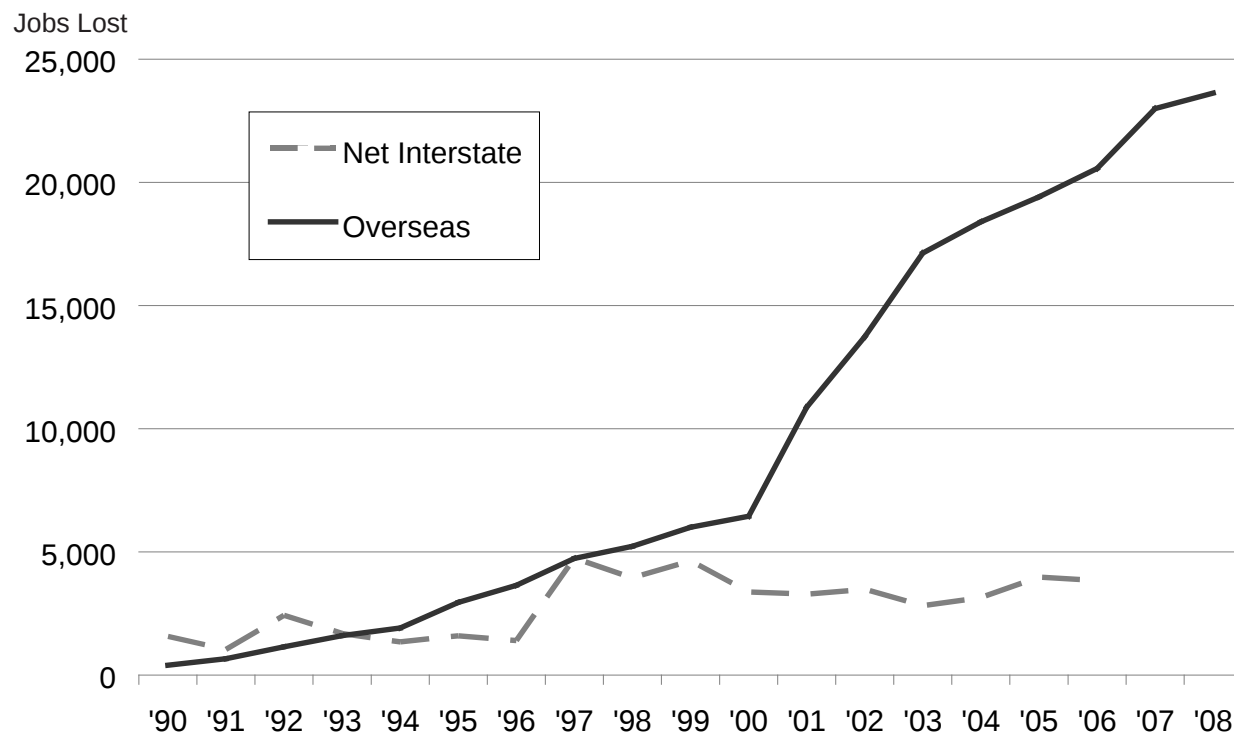


Figure 7: Cumulative Pennsylvania High-Tech Job Losses from Interstate & Overseas Moves (1990 - 2008)



These data may understate job loss due to globalization, because not every eligible company petitions (the share of potentially eligible firms that don't petition is not known) and not every petition is accepted. In calendar 2007, the U.S. Department of Commerce received 163 petitions from Pennsylvania firms, denied 53 and certified 99, the sum not totaling since some petitions span more than one calendar year.¹¹

These jobs lost offshore were not offset by jobs gained due to foreign direct investment into Pennsylvania. Indeed, during the same period 2001 through 2006, the number of jobs at majority-owned, non-bank affiliates of foreign direct investors in the state declined by 4,900 (from 253,900 to 249,000).¹²

Interstate Relocations: Induced by Economic Development Lures?

In the course of performing this study, we were told by New Jersey economic development officials that Pennsylvania was aggressively offering incentives to small pharmaceutical companies to lure them across the state line. Realizing the potential for such episodes to be a costly zero-sum game, we investigated all seven states' behavior.

To determine the validity of the original New Jersey complaint, we examined Pennsylvania Department of Community and Economic Development press releases as well as newspaper archives. The Department's announcements boast of numerous subsidy deals (with as much as \$8.2 million awarded) involving relocation of existing jobs into Pennsylvania. We performed the same analysis (using both state government and news media archives) on the other six states.¹³ We also queried the partner organizations assisting us with this study in those states.

We found ten cases of interstate job relocations that were either announced by governors or via state-government press releases and included subsidy packages. Of those, one was into North Carolina (\$2.8 million)¹⁴, one into Maryland (\$600,000)¹⁵, and the other eight were into Pennsylvania (ranging from \$200,000 to \$8.2 million). However, in press clips, the Pennsylvania governor's office also touted new investment in Pennsylvania thanks to state-supported venture capital firms. After pressing further, these appear to be the incentives New Jersey officials were referencing.

State-supported Pennsylvania venture capital funds rarely declare award amounts and only hint at relocation subsidies; however, fund-specific annual reports do report relocations (the Life Science Greenhouses of Pittsburgh and Central Pennsylvania, and BioAdvance the Biotechnology Greenhouse of Southeastern Pennsylvania).¹⁶ The Pittsburgh Life Science Greenhouse reports that 10 out of the 44 companies in its 2007 portfolio were relocations. The Life Sciences Greenhouse of Central Pennsylvania claims to have given \$1.5 million (part of a \$4.6 million package) in "Relocation Assistance" to GlaxoSmithKline, PLC. BioAdvance claims to have relocated Phoenix S&T's headquarters to Pennsylvania from Maryland. Most of the annual report citations do not say where the companies came from. The total number of possible relocations in Pennsylvania, including these venture capital firm claims, jumps from 8 to 20.

Based on these sources, then, Pennsylvania stands out negatively, with more apparent cases of subsidized interstate job relocations than the other six states combined. Although our evidence does not prove that the other six states do not offer subsidies to companies moving from other states (perhaps they do it passively rather than actively), it certainly suggests Pennsylvania is an outlier.

Besides the number of episodes, we also compared the size of the subsidy packages and the value of the subsidy per projected job. By the two additional measures, Pennsylvania also stands out. However, deeper comparisons are difficult because news clippings and press releases have inconsistent quality of detail, and some deals involve contractions and expansions in conjunction with relocations.¹⁷ In addition, many deals appear to have veered from their original job projections.

To summarize: what we can say for sure is that Pennsylvania reports job gains through relocation of companies from other states far more than the six competing states covered in this study. We make no conclusions regarding impact: the governor's press releases sometimes exaggerate job creation benefits; much more detailed research would be needed to assess outcomes.

Sectoral Analysis of NETS Data

Looking again at NETS, this time by sector instead of geography, most of the interstate job movement was in just two sectors: Standard Industrial Codes (SICs) 36 (Electronic & Electrical Equipment & Components, except computer equipment) and 38 (Measuring, Analyzing, and Controlling Instruments). (See Table 8.)

Table 8: Net Changes in Employment from High-Tech Firms Moving Into and Out of Pennsylvania by 2-Digit SIC (1990 - 2006)

Two Digit SIC description	SIC	Out	In	Net
Electronic & Electrical Equip. & Components (except computer equip.)	36	3,490	5,999	2,509
Transportation Equipment mfg.	37	16	643	627
Fabricated Metal products mfg. (except mach. & trans. equip.)	34	79	539	460
Industrial & Commercial Machinery & Computer Equipment mfg.	35	591	913	322
Engineering, Accounting, Research, Mgmt. & Related Services	87	718	905	187
Wood products mfg.	24	70	119	49
Health Services	80	50	56	6
Motion Pictures	78	23	26	3
Communications	48	179	181	2
Misc. Retail (optical, orthopedic)	59	612	576	-36
Misc. Manufacturing	39	145	3	-142
Rubber & Misc. products mfg.	30	1,904	1,697	-207
Chemicals & Allied products mfg.	28	1,446	929	-517
Primary Metal industries	33	567	23	-544
Business Services	73	8,619	7,733	-886
Measuring, Analyzing & Controlling Instruments mfg.; Photographic, Medical & Optical Goods mfg.; Watches & Clocks mfg.	38	6,433	1,750	-4,683
Totals		24,942	22,092	-2,850

Electrical Equipment enjoyed 60 percent of the growth, and most of that was within two smaller (four-digit) SICs: Radio & TV broadcasting and Communications Equipment (SIC 3663) and Electrical Industrial Apparatus NEC [Misc.] (SIC 3629). (See online Appendix C1 for a complete four-digit breakdown.)

Offsetting losses were concentrated in three smaller electronics SICs: Storage Batteries (SIC 3691); Carbon & Graphite Products (SIC 3624); and Electronic Components, NEC (antennas, radio headphones & printed circuit/electronic assembly manufacturing (SIC 3679)).

Similarly, 67 percent of the losses by sector were in Measuring Instruments (SIC 38). Most of the losses were in three sub-categories: Orthopedic, Prosthetic, and Surgical Appliances and Supplies (SIC 3842); Laboratory Analytical Instruments (SIC 3826); and Totalizing Fluid Meters and Counting Devices (SIC 3824).

Other sectoral findings:

- Most of the SIC categories had rough equivalence between jobs gained and lost.
- Business Services (SIC 73) showed a modest net loss but there was substantial activity in and out. This sector is comprised largely of small firms; there were more than 1,400 moves in and out.
- Over 80 percent of all Business Services facilities that moved in or out were from three sub-categories: microfilm services (SIC 7389); computer programming (SIC 7371); and Computer Related Services, NEC (disk conversion services & computer systems consultants; SIC 7379).
- Of the 7,113 jobs lost in Measuring Instruments (SIC 38), 3,520 were from three firms.

Other Characteristics of Relocations: Wages, Survival, Ownership Structure and Exports

Finally, the NETS data show that jobs lost paid slightly better than jobs gained, although the difference is quite modest. In addition, more of the jobs that moved out were still active than those gained but, again, the difference is marginal. Indeed, over 40 percent of all jobs gained and lost during the period are inactive. And the data show that relocations did not affect the ownership mix (see Figure 8), although they did slightly increase the propensity to import and export among the state's high tech industries.

An identical share of firms that moved either into or out of Pennsylvania from 1990 through 2006 are no longer active: 41 percent (see Table 9). As measured by jobs, the only variance is that in-bound jobs were slightly more likely not to survive, by four percent (see Table 10).

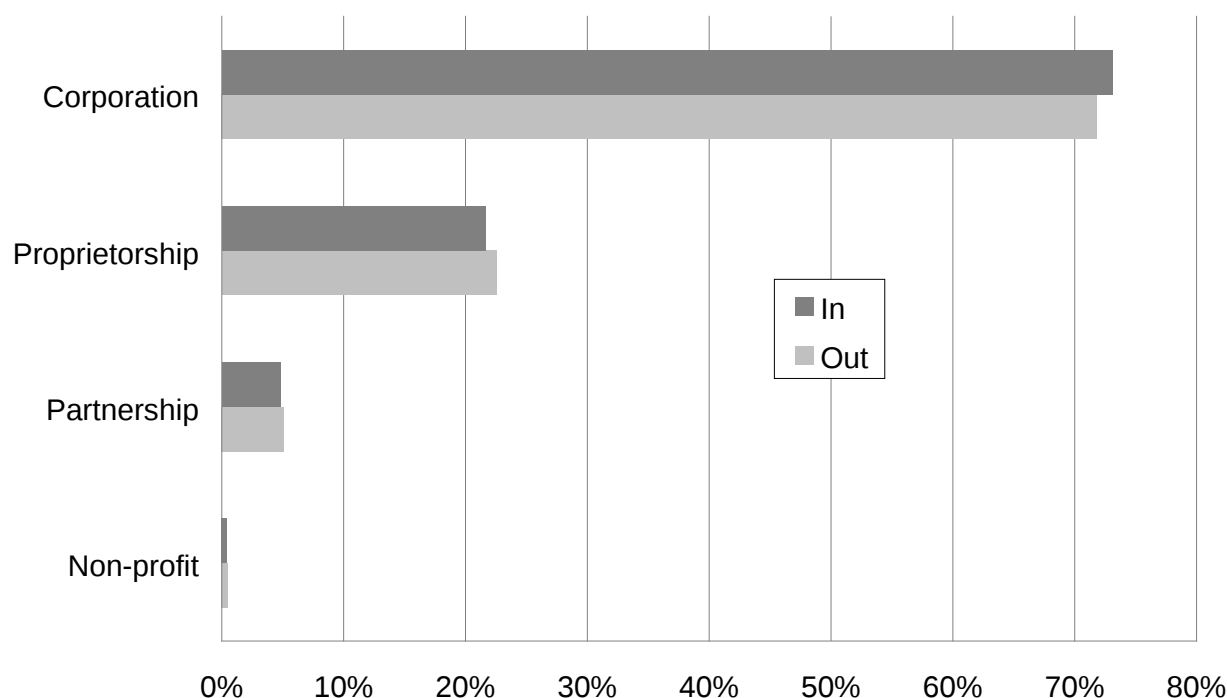
Table 9: Status of High-Tech Firms Moving Into and Out of Pennsylvania (1990 - 2006)

Status	Out		In		Total	% of Total
	#	%	#	%		
Active	704	59	727	59	1,431	59
Not active	494	41	514	41	1,008	41
Totals	1,198	100	1,241	100	2,439	100

Table 10: Status of Jobs in High-Tech Firms that Moved Into and Out of Pennsylvania (1990 - 2006)

Status	Out		In		Total	% of Total
	#	%	#	%		
Active	14,736	59	12,102	55	26,838	57
Not active	10,206	41	9,990	45	20,196	43
Totals	24,942	100	22,092	100	47,034	100

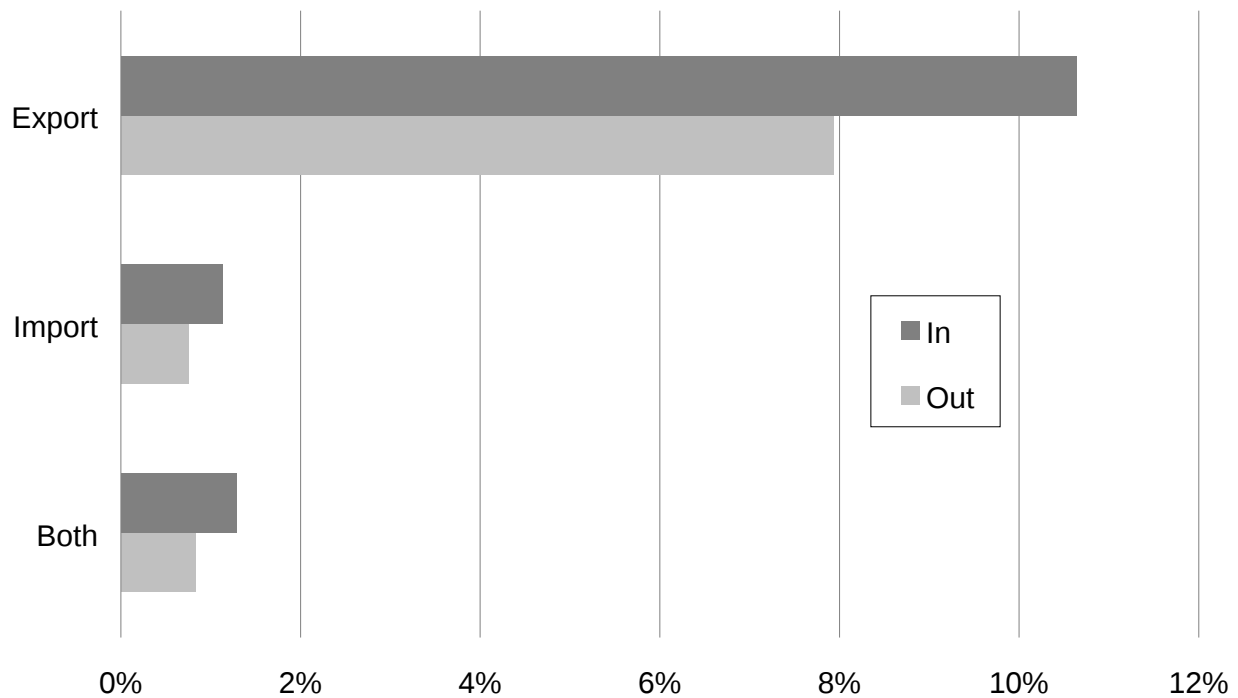
Figure 8: Legal Status of Firms Moving Into and Out of Pennsylvania (1990 - 2006)



The legal status of high tech establishments moving into and out of Pennsylvania was also very similar (see Figure 9). Corporations dominated (over 70 percent) but that includes C and S corporations as well as Limited Liability Companies (LLCs). Almost 30 percent were partnerships and proprietorships, with the remainder being non-profits. As with every other measure, the data shows that high tech interstate moves are largely a wash.

The percentage of high tech facilities engaged in importing or exporting was similar for those moving in and out, with those moving in somewhat more likely to be importers and/or exporters (see Figure 9).

**Figure 9: Import-Export Activities of Firms
Moving Into and Out of Pennsylvania (1990 - 2006)**



The wages of high tech jobs gained and lost have been nearly identical: the weighted average wage for SICs with net job gains was \$60,826, while the average for SICs with net losses was \$62,174 (see Appendix C2).¹⁸ (Note: These industry-average wage data include management and professional staff, so they exceed the wages of line workers and administrative staff.)

The percentage of foreign-owned high tech firms that moved into and out of Pennsylvania is identical (two percent each). However, job losses from departing foreign-owned firms were much greater than gains from firms moving in (-3,064 vs. +610). But of the jobs lost, almost 15 percent no longer exist because the firms are not active. Even though this all occurred over a period of seventeen years (so the annual impacts are tiny), it suggests that the state should be cautious when attempting to lure foreign-owned employers.

The Occupational Advantage of Regions: An Alternative Approach to Stimulating Economic Development

by Stephen Herzenberg and Mark Price

The bulk of this report explores the limitations of traditional subsidy-based approaches to stimulating high-technology development. If incentive-based approaches don't deliver a high return on investment, however, what other options exist? The opposite of putting "a lot of eggs in a few corporate baskets" (i.e., granting large incentive packages to a small number of private entities) is investing broadly in public goods. At the top of that list would always come skills and infrastructure.

This strategy is inherently more egalitarian: a skilled workforce and efficient infrastructure benefit all employers. As well, investing in public goods reduces taxpayer risk and makes regional economies more resilient to the loss of any one individual workplace. If a facility closes or a mass layoff occurs, the infrastructure remains, benefiting every other employer. Some dislocated workers may eventually choose to leave the region, but as a group human capital, enhanced through investments in education, is also non-mobile relative to individual businesses.

In recent years, some states have targeted their skills investments to particular sectors, including high-technology industries. One of the most developed examples of investing in industry-specific skills is Pennsylvania's Industry Partnership strategy.¹⁹ A related but less well-known alternative economic development strategy, deserving of more attention and experimentation, is to build on occupational clusters or networks (as opposed to industrial clusters). Prof. Ann Markusen suggests several reasons that investments in occupational clusters and networks make sense.²⁰

- First, investing in occupational clusters also means investing in human capital—i.e., the skills and networking of members of an occupation—which states spend too little on relative to investment in physical capital and which studies suggest delivers a much higher return on investment.²¹
- Second, as noted above, people are less mobile than firms and thus state investments are more likely to stay within the state and region. The state will suffer less "leakage" of its investments.
- Third, the internet makes it increasingly possible for a wide range of occupations—in new media, engineering, consulting, and other professions—to work primarily at a distance, using a mix of teleconferencing and occasional travel to maintain relationships with clients and customers. As a result, the export potential (meaning the ability to sell services outside of the metro area or state, but not necessarily to foreign markets) of occupational clusters is growing, especially in low-cost,

medium-sized metro areas which have good quality of life and are also within a few hours (or less with the advent of high-speed rail) of major population or manufacturing centers. (Did someone say Pittsburgh?)

Although not always explicitly acknowledged, occupational networks are often the source of dynamism behind industry clusters. That is, industry clusters bolster regional economic advantage in large part because they include highly-developed networks of key professionals that make the industry cluster dynamic. Occupational clusters attract entrepreneurs and venture capital. If a start-up company fades, the skilled technical workforce takes its skills to other employers; if a company thrives, it may hire dislocated workers. Either way, public investments in education fuel innovation and entrepreneurship.

The classic illustration here is Silicon Valley, the regenerative power of which is owed to software programmers who move fluidly across companies and trade their latest ideas at local fern bars.²² But the same logic applies to publishing in New York—which is nourished by networks of top-flight editors who populate high-end restaurants at lunch time—and Hollywood, where actors, directors, agents, and producers all feed off each other’s knowledge and skills to sustain an advantage now approaching a century old.

The Keystone Research Center has suggested that Pennsylvania’s high-tech investments should focus explicitly on bolstering occupational networks, a potentially more cost-effective approach in Life Sciences than seeding new companies or providing them with venture capital.²³ Investing in occupational networks would be a natural extension of Pennsylvania’s current workforce strategy, which, as noted, relies on grants to “Industry Partnerships” to bolster human capital specific to the state’s regional industry clusters.²⁴

As a quick scan (suggesting the value of a more comprehensive assessment) of the potential of metropolitan regions within the seven states covered here to pursue an occupational advantage strategy, the rest of this section presents basic numbers on the high-tech occupational strengths of each state and its two largest metro areas. We measure occupational strength in a way that is directly analogous to the most common way of measuring industry strength—through location quotients.²⁵ Occupational location quotients measure the strength of a regional (or state) occupation or occupational cluster by dividing the occupational share of employment in the region (or state) by the occupational share of employment in the country as a whole. Thus if an occupational LQ equals two the geographical area has twice as big a share of its employment in the occupation as does the nation.

The discussion below presents data for all seven states and for 12 metro areas but the text discussion focuses on the insights from this analysis for the Pittsburgh metro area. The additional metro areas include: Philadelphia; Trenton and Monmouth-Ocean in New Jersey; New York City and Buffalo-Niagara Falls in New York; Raleigh-Durham and Charlotte-Gastonia-Rock Hill in North Carolina; Cleveland and Columbus in Ohio; and Baltimore and Hagerstown in Maryland. (No West Virginia metro area is included in the data series used for this analysis, which is the Public Use data set based on the American Community Survey.)

Occupational Advantage and Disadvantage in Pittsburgh

Engineering Occupations

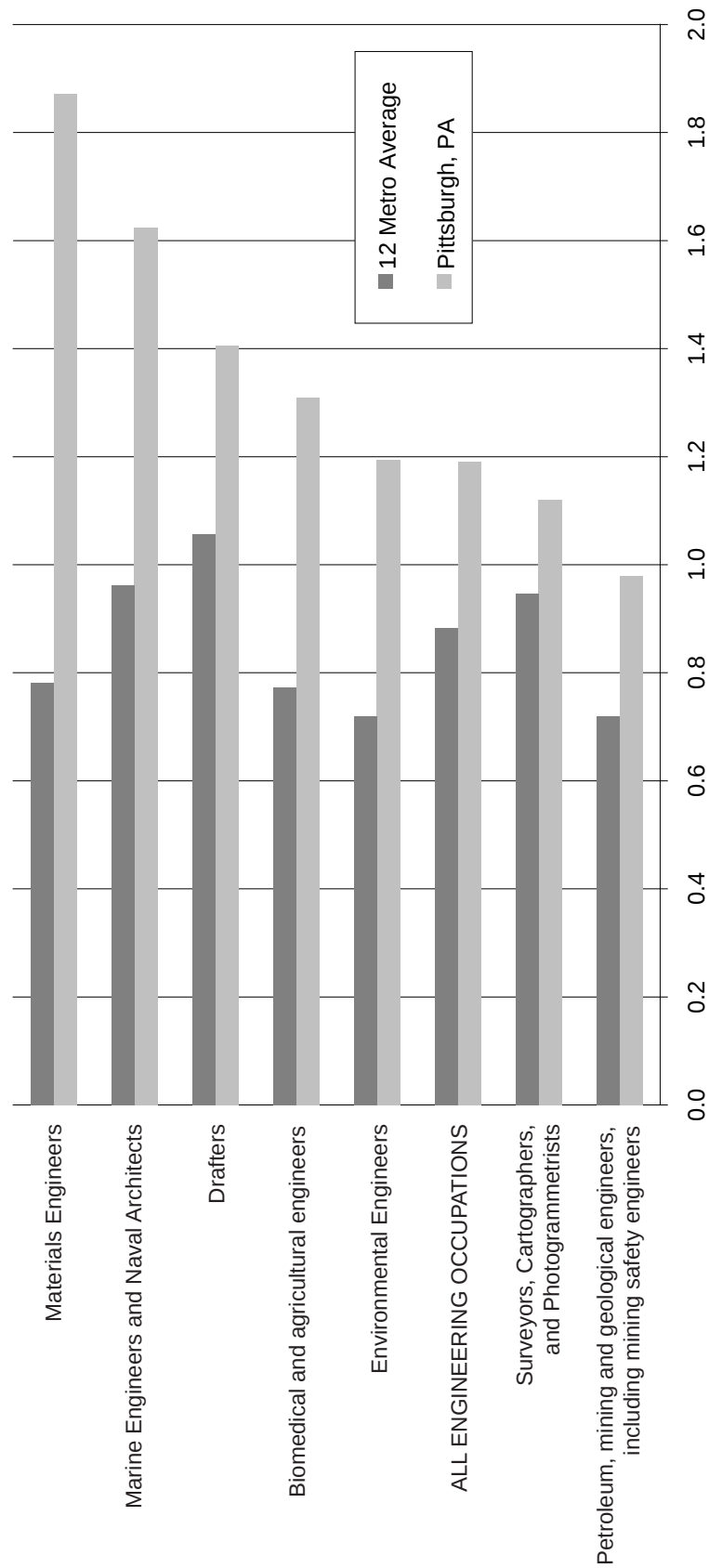
Figure 10 and Tables 11 and 12 examine, in our seven states and 12 metro areas, location quotients for engineering occupations at the three-digit level.²⁶ This group of occupations in Pittsburgh has an LQ of 1.19 compared to .88 for the 12 metropolitan areas overall. Pittsburgh has an LQ greater than 1.10 in six of the seven largest occupations which account for 84 percent of employment in this group. The three-digit occupations where Pittsburgh is the strongest relative to the nation and relative to the 12 metropolitans considered as a whole are:

- miscellaneous engineers including nuclear engineers (1.62)
- civil engineers (1.41)
- drafters (1.87)
- mechanical engineers (1.2)
- electrical and electronics engineers (1.12)

These LQs make very clear that, while the manufacturing share of employment in the Pittsburgh metro area has dipped to 8.6 percent, which is below the national average²⁷, the region retains significant strength within engineering occupations. One interpretation of this is that the region's engineering assets reflect the role of higher education institutions. To explore this hypothesis, we analyzed the share of engineering employment in the region that is attributable to higher education—and found that it is very small. This suggests that Pittsburgh's engineering strength reflects the region's industrial heritage and continues to generate exports out of the region.

These findings indicate that Pittsburgh would be well served to focus explicitly on how it can maintain and further strengthen engineering talent that translates into high-value exports. Should the region subsidize continuing education activities, professional seminars, and research projects organized by engineering professional associations, in some cases in partnership with engineers in universities? Should the region recognize through an awards program the contribution to regional prosperity of leading engineers? Should the region sponsor travel to production operations which draw or could draw upon Pittsburgh engineering talent—to help maintain the region's competitive cutting edge, for marketing purposes, or both? Should the region work with local engineers to strategically identify innovative new production operations—operations that may be the first of their kind globally to reach production scale—that should be given incentives to site locally because this will enable Pittsburgh engineers to sustain consulting competitive advantages when similar operations spread to other locations? In the context of the green economy, how can Pittsburgh help its powerful networks of engineers to flourish? Should it nurture the skills base within the region's green building and green products clusters with heightened attention to the potential exports that could result from having clusters of specialized green engineers?

Figure 10: Occupation Based Location Quotients in Pittsburgh and 12 Metro Areas*
for Architecture and Engineering Occupations



*The 12 metropolitan areas include Pittsburgh, Philadelphia, Cleveland, Columbus, Charlotte-Gastonia-Rock Hill, Raleigh-Durham, New York-Northeastern NJ, Buffalo-Niagara Falls, Monmouth-Ocean, Trenton, Baltimore, Hagerstown.

Source: KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

Table 11: Occupation Based Location Quotients in Pittsburgh and 12 Metro Areas* for Engineering Occupations

Occupations	Pittsburgh, PA	Philadelphia, PA/NJ	Baltimore, MD	Hagerstown, MD	Trenton, NJ	Monmouth-Ocean, NJ	New York-Northeastern NJ	Buffalo-Niagara Falls, NY	Cleveland, OH	Columbus, OH	Raleigh-Durham, NC	Charlotte-Gastonia-Rock Hill, NC-SC	12 Metro Average
All Engineering Occupations	1.19	0.92	1.24	0.87	0.92	1.09	0.67	1.01	1.00	0.93	1.57	0.94	0.88
Civil Engineers	1.41	0.96	1.81	#N/A	#N/A	1.62	0.87	0.87	0.72	1.08	1.83	1.19	1.06
Drafters	1.87	0.96	0.93	#N/A	#N/A	#N/A	0.56	#N/A	0.84	1.01	0.96	#N/A	0.78
Electrical and Electronics Engineers	1.12	0.91	1.39	#N/A	#N/A	1.52	0.71	#N/A	0.95	1.06	1.91	1.29	0.95
Engineering Technicians, Except Drafters	0.98	0.69	1.11	#N/A	#N/A	0.90	0.53	0.86	0.94	0.70	1.33	0.78	0.72
Industrial Engineers, including Health and Safety	1.31	0.64	0.75	#N/A	#N/A	#N/A	0.55	#N/A	1.40	#N/A	1.37	1.20	0.77
Mechanical Engineers	1.20	0.59	0.68	#N/A	#N/A	#N/A	0.43	1.92	1.68	1.15	1.07	0.95	0.72
Miscellaneous engineers including nuclear engineers	1.62	0.93	1.58	#N/A	#N/A	1.58	0.65	0.99	1.07	0.98	1.84	0.92	0.96

*The 12 metropolitan areas include Pittsburgh, Philadelphia, Cleveland, Columbus, Charlotte-Gastonia-Rock Hill, Raleigh-Durham, New York-Northeastern NJ, Buffalo-Niagara Falls, Monmouth-Ocean, Trenton, Baltimore, Hagerstown.

Source: Keystone Research Center (KRC) estimates based on 2005-2007 American Community Survey (ACS) data distributed by the Minnesota Population Center

Table 12: Occupation Based Location Quotients for Seven States in Engineering

Occupations	PA	MD	NJ	NY	OH	WV	NC
All Engineering Occupations	0.95	1.18	0.88	0.75	0.96	0.72	0.89
Civil Engineers	0.90	1.47	1.08	0.85	0.70	0.69	0.84
Drafters	1.39	0.87	0.61	0.67	0.98	0.91	0.83
Electrical and Electronics Engineers	0.92	1.46	0.92	0.85	0.86	#N/A	0.92
Engineering Technicians, Except Drafters	0.90	1.07	0.76	0.65	0.94	0.75	1.01
Industrial Engineers, including Health and Safety	0.91	0.68	0.80	0.73	1.31	#N/A	1.21
Mechanical Engineers	0.88	0.56	0.49	0.73	1.64	#N/A	0.85
Miscellaneous engineers including nuclear engineers	0.95	1.55	1.12	0.74	0.92	#N/A	0.83

Source. KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

The potential—and need—for an occupational approach, or a blend of an occupational and a nuanced industrial approach, is powerfully illustrated by research (funded by the Heinz Endowments) on the steel technology cluster.²⁸ This research, by Carey Treado of the Center for Industry Studies at the University of Pittsburgh, makes abundantly clear that, while the popular perception is that the entire steel industry in Pittsburgh has declined, the region retains a powerful steel technology advantage. Anchored in continuing strength within the steel supply chain, including both engineering services and manufactured parts, Pittsburgh's steel advantage is reflected in the fact that 329 of the 1,800 firms in the 2003 directory of the Association for Iron and Steel Technology (AIST) are located in the Pittsburgh region. Chicago-Gary (with 199 entries) and Cleveland (with 124) are a distant second and third.

Yet Pittsburgh's steel strength is at risk because of an aging workforce of engineers and researchers and also because the network connections between industry and higher education, and among businesses, have been neglected. What might have been the return on investment of a strategic redeployment of the stadium subsidies given to one of the region's professional sports franchises to nurturing the occupational clusters that fuel the region's continuing dynamism in steel? What would it mean for the region to focus more on occupational clusters than a few large deals as opportunities may open up again globally in the nuclear power industry?

Computer and Mathematical Occupations

Figure 11 and Tables 13 and 14 present location quotients at the three-digit level for computer and mathematical occupations.²⁹ Overall for these occupations, Pittsburgh has an LQ of 1 compared to 1.26 for the 12 metropolitan areas. In this cluster, six occupations account for 92 percent of total employment. Among these six dominant occupations, the 12 metros as a whole have a higher LQ than Pittsburgh. Below are Pittsburgh's LQs for five of these six largest occupations. (In the sixth occupation, the sample size for Pittsburgh is below the cutoff of 30 which we use for reporting data.)

- Computer Software Engineers (1.00)
- Computer Scientists and Systems Analysts (1.04)
- Computer Programmers (0.98)
- Computer Support Specialists (1.09)
- Network systems and data communications analysts (.86)

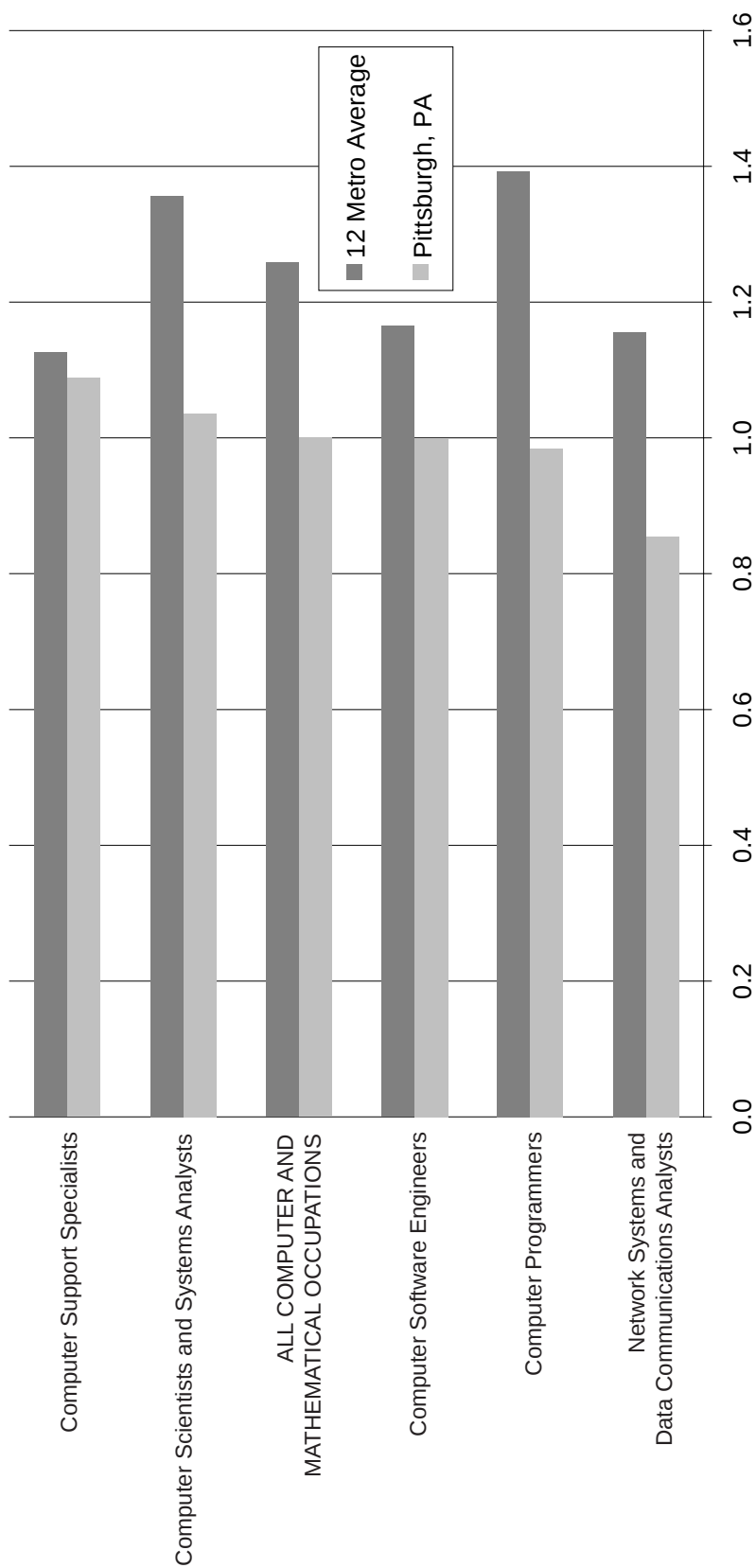
These figures suggest that information technology is not a particular strength of the Pittsburgh region. In some parts of information technology, Pittsburgh likely relies on outside firms and consulting services more than other metro regions. To explore this more deeply the region could conduct interviews and surveys with major IT consumers to understand better their sourcing for IT and also to understand where they think the Pittsburgh region is strong, adequate, or weak in IT services. The end result could be an occupational education and networking "import substitution" initiative (i.e., to replace services now imported from outside the region).

Table 13: Occupation Based Location Quotients for Seven States in Computer and Mathematical Occupations

Occupations	PA	MD	NJ	NY	OH	WV	NC
Computer and Mathematical	0.94	2.01	1.52	0.90	0.88	0.49	0.89
Computer Programmers	0.98	1.40	1.80	1.12	0.96	0.37	0.87
Computer Scientists and Systems Analysts	0.97	2.09	1.66	1.00	0.94	0.56	0.92
Computer Software Engineers	0.85	2.05	1.53	0.69	0.71	0.26	0.84
Computer Support Specialists	0.99	1.52	1.26	0.85	1.00	0.63	0.89
Network and Computer Systems Administrators	0.90	2.58	1.43	0.87	0.94	#N/A	0.89
Network Systems and Data Communications Analysts	0.83	1.93	1.22	0.97	0.83	#N/A	0.97

Source. KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

**Figure 11: Occupation Based Location Quotients in Pittsburgh and 12 Metro Areas*
for Computer and Mathematical Occupations**



*The 12 metropolitan areas include Pittsburgh, Philadelphia, Cleveland, Columbus, Charlotte-Gastonia-Rock Hill, Raleigh-Durham, New York-Northeastern NJ, Buffalo-Niagara Falls, Monmouth-Ocean, Trenton, Baltimore, Hagerstown.

Source: KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

Table 14: Occupation Based Location Quotients in Pittsburgh and 12 Metro Areas* for Computer and Mathematical Occupations

Occupations	Pittsburgh, PA	Philadelphia, PA/NJ	Baltimore, MD	Hagerstown, MD	Trenton, NJ	Monmouth-Ocean, NJ	New York-Northeastern NJ	Buffalo-Niagara Falls, NY	Cleveland, OH	Columbus, OH	Raleigh-Durham, NC	Charlotte-Gastonia-Rock Hill, NC-SC	12 Metro Average
All Computer and Mathematical Occupations	1.00	1.30	1.84	0.82	2.12	1.24	1.16	0.79	0.93	1.59	2.12	1.02	1.26
Computer Programmers	0.98	1.25	1.33	#N/A	2.74	1.45	1.47	1.07	1.22	1.47	1.94	1.29	1.39
Computer Scientists and Systems Analysts	1.04	1.36	1.96	#N/A	2.34	1.17	1.34	1.08	0.95	1.55	1.48	1.33	1.36
Computer Software Engineers	1.00	1.35	1.80	#N/A	1.75	1.50	0.95	0.54	0.68	1.55	3.00	0.76	1.17
Computer Support Specialists	1.09	1.09	1.47	#N/A	#N/A	0.79	1.03	0.80	1.24	1.60	1.80	0.93	1.13
Network and Computer Systems Administrators	0.90	1.28	2.42	#N/A	#N/A	1.62	1.03	#N/A	0.64	1.82	1.48	1.05	1.21
Network Systems and Data Communications Analysts	0.86	1.12	1.54	#N/A	#N/A	1.01	1.10	#N/A	0.87	1.54	2.66	0.73	1.16

*The 12 metropolitan areas include Pittsburgh, Philadelphia, Cleveland, Columbus, Charlotte-Gastonia-Rock Hill, Raleigh-Durham, New York-Northeastern NJ, Buffalo-Niagara Falls, Monmouth-Ocean, Trenton, Baltimore, Hagerstown.

Source: KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

Health Care and Biomedical Occupations

Figure 12 and Tables 15 and 16 present location quotients for selected health care and biomedical occupations.³⁰ This group of occupations in Pittsburgh has an LQ of 1.42 compared to 1.11 for the 12 metropolitan areas. Whether and how much these location quotients represent occupational advantages that should be nurtured—or other factors, such as an aging population and high ratios of medical occupations per resident (i.e., inefficiency or high health care costs)—would require further research.

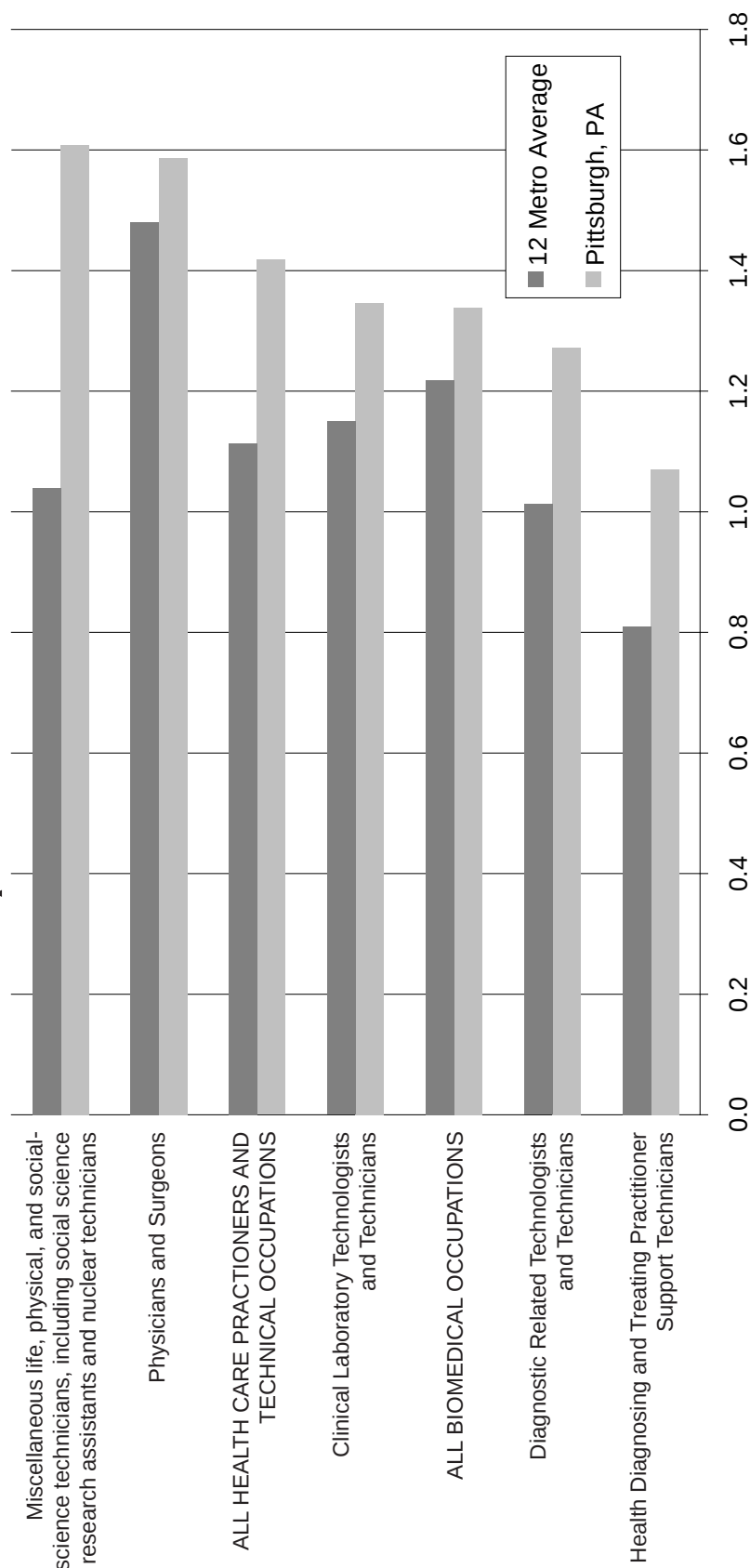
Calculating LQs for a subset of these health care occupations as well as other occupations defined by the Pennsylvania Department of Labor and Industry as part of the biomedical³¹ sub-cluster shows that Pittsburgh maintains a relative advantage over its peers.³² Pittsburgh has an LQ of 1.34 for all biomedical occupations compared to 1.22 for the 12 metropolitan areas. Since 2000, employment in the occupations that make up biomedical sub-cluster has increased from 19,155 to 22,594 in the Pittsburgh region.

Table 15: Occupation Based Location Quotients for Seven States in Healthcare and Biomedical Occupations

Occupations	PA	MD	NJ	NY	OH	WV	NC
All Health Care Practitioners and Technical Occupations	1.22	1.08	1.02	1.08	1.14	1.29	1.05
All Biomedical Occupations	1.23	1.35	1.12	1.05	1.00	1.20	1.04
Clinical Laboratory Technologists and Technicians	1.20	1.33	1.11	0.94	0.96	1.43	1.30
Diagnostic Related Technologists and Technicians	1.18	0.92	0.99	0.89	1.20	0.99	1.08
Health Diagnosing and Treating Practitioner Support Technicians	1.06	0.91	0.74	0.72	1.08	1.50	1.02
Miscellaneous life, physical, and social science technicians, including social science research assistants and nuclear technicians	1.30	1.56	0.86	0.83	0.84	1.18	1.07
Physicians and Surgeons	1.28	1.40	1.20	1.41	0.95	1.13	0.92

Source. KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

Figure 12: Occupation Based Location Quotients in Pittsburgh and 12 Metro Areas*
for Healthcare Practitioners and Biomedical Occupations



*The 12 metropolitan areas include Pittsburgh, Philadelphia, Cleveland, Columbus, Charlotte-Gastonia-Rock Hill, Raleigh-Durham, New York-Northeastern NJ, Buffalo-Niagara Falls, Monmouth-Ocean, Trenton, Baltimore, Hagerstown.

Source: KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

**Table 16: Occupation Based Location Quotients in Pittsburgh and 12 Metro Areas*
in Healthcare and Biomedical Occupations**

Occupations	Pittsburgh, PA	Philadelphia, PA/NJ	Baltimore, MD	Hagerstown, MD	Trenton, NJ	Monmouth-Ocean, NJ	New York-Northeastern NJ	Buffalo-Niagara Falls, NY	Cleveland, OH	Columbus, OH	Raleigh-Durham, NC	Charlotte-Gastonia-Rock Hill, NC-SC	12 Metro Average
All Health Care Practitioners and Technical Occupations	1.42	1.28	1.21	0.90	0.85	1.14	1.00	1.25	1.28	1.04	1.24	0.95	1.11
All Biomedical Occupations	1.34	1.49	1.46	0.92	1.55	0.94	1.10	1.22	1.19	1.15	1.81	0.82	1.22
Clinical Laboratory Technologists and Technicians	1.35	1.26	1.49	#N/A	#N/A	#N/A	1.00	1.21	1.07	1.05	2.19	0.95	1.15
Diagnostic Related Technologists and Technicians	1.27	1.35	1.04	#N/A	#N/A	0.99	0.82	1.23	1.46	1.16	0.99	0.85	1.01
Health Diagnosing and Treating Practitioner Support Technicians	1.07	1.04	1.06	#N/A	#N/A	0.72	0.57	1.64	1.02	0.88	0.95	0.98	0.81
Miscellaneous life, physical, and social science technicians, including social science research assistants and nuclear technicians	1.61	1.49	1.41	#N/A	#N/A	#N/A	0.71	#N/A	#N/A	1.23	2.83	#N/A	1.04
Physicians and Surgeons	1.59	1.62	1.59	#N/A	1.66	1.22	1.53	1.06	1.37	1.30	1.76	0.85	1.48

*The 12 metropolitan areas include Pittsburgh, Philadelphia, Cleveland, Columbus, Charlotte-Gastonia-Rock Hill, Raleigh-Durham, New York-Northeastern NJ, Buffalo-Niagara Falls, Monmouth-Ocean, Trenton, Baltimore, Hagerstown.

Source. KRC estimates based on 2005-2007 ACS data distributed by the Minnesota Population Center

Case Studies: Eight Major High-Tech Deals

To get a better sense of how economic development incentives for high-tech projects work in practice, we undertook a series of case studies involving Pennsylvania and half a dozen other states. Those other states include five immediate neighbors—Maryland, New Jersey, New York, Ohio and West Virginia as well as North Carolina, which has been one of the most aggressive seekers of high-tech investments in the East.

For Pennsylvania, we chose the case of Westinghouse Electric’s nuclear power research operation in Cranberry Township, for which the state legislature created a new form of incentive zone called Strategic Development Areas.

In some of the other states, the choice of which project to include was easy. North Carolina had two high-profile high-tech investment deals—Dell and Google—and we decided to examine both of them. New York offered one of the largest incentive packages ever—more than \$1 billion—to semiconductor maker Advanced Micro Devices (which later handed the operation over to GlobalFoundries), so that was a natural choice.

In the remaining states, there were no high-tech deals of such prominence, so we tried to pick deals from several different industries and ones involving different types of companies, including those that are foreign-owned and non-profit. We also looked for variations in the importance and size of the subsidies offered. Here is a list of the case studies that follow:

- Pennsylvania: Westinghouse Electric
- North Carolina: Dell
- North Carolina: Google
- New York: Advanced Micro Devices/GlobalFoundries
- Ohio: Amylin Pharmaceuticals
- Maryland: Battelle Memorial Institute
- New Jersey: Altana Pharma/Nycomed
- West Virginia: Kureha

Pennsylvania Case Study: Westinghouse Electric (Cranberry)

Pennsylvania, believing it was in competition with North Carolina, enacted a special new “Strategic Development Areas” program to help capture an expansion of Westinghouse Electric’s existing Pittsburgh-area nuclear power research facilities. The Strategic Development Areas (SDAs) are essentially aggressive enterprise zones; they abate multiple state and local taxes for 15 years, but are not specific to high technology.

The state also said it discouraged two neighboring localities from competing for the deal, but what else these localities could have offered beyond \$3 million a year in local tax incentives by virtue of an SDA authorization is not clear. The state’s high-tech incentives were not credited at the time for influencing the deal and their value in the transaction is not evident.

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.

The Company

Westinghouse Electric, founded in 1886, became a leading producer of commercial nuclear power plants after the Second World War. It was acquired by Britain’s BNFL PLC in 1999 and was sold again to Japan’s Toshiba Corporation in 2006.

The Deal as Reported by News Media

In November 2006, while Westinghouse Electric (which had just been acquired by Tokyo-based Toshiba Corporation) was deciding where to locate a major new engineering facility for its nuclear power business, Pennsylvania enacted a new subsidy package aimed at attracting the facility and retaining the company in the Pittsburgh area.³³ The legislation (Senate bill 854) empowered the governor to create up to four “Strategic Development Areas,” (including two in western Pennsylvania) for companies that committed to maintaining at least 500 jobs and making \$45 million or more in capital investments within three years. The Areas would provide tax credits and exemptions including corporate income tax credits and a sales tax exemption for up to 15 years,

three years longer than the state's most-generous Keystone Opportunity Zone program. Westinghouse was expected to add a total of about 1,500 new jobs.

The next month, the company announced that it had settled on locating the facility in western Pennsylvania.³⁴ It had previously said it was also considering Charlotte, North Carolina, and other unspecified locations. The company said it was considering both Cranberry and Monroeville, where it already had extensive operations. Commissioners in Butler County, home to Cranberry, quickly adopted a resolution supporting the creation of Strategic Development Area for Westinghouse.³⁵

On March 20, 2007 Westinghouse announced it had chosen Cranberry for the new facility and said it would consolidate its existing Monroeville operations there as well.³⁶ The company said the local tax incentives (worth about \$3 million a year) were the same in both locations but that Cranberry offered a better site for expansion and construction savings.

Details from Public Documents

Our open records request to the state's Department of Community and Economic Development for correspondence and documents yielded only one document: the Opportunity Grant Program contract signed by the state and Westinghouse in 2008. The grant provided the company \$1.65 million to defray capital costs relating to the new facility in Cranberry.

Our request to Cranberry Township also did not yield any significant correspondence with Westinghouse. This apparently reflects the fact that by formally authorizing the state-designated Strategic Development Area, the township surrendered its local property tax revenue and had little else to do. We received a letter to the town board of supervisors from Gov. Ed Rendell dated January 2, 2007 (before the company made its final location decision) in which he said that if SB 854 had not been passed "we would have faced the very real possibility of losing a Pennsylvania legacy company and its 3,000 jobs." He further stated that he did not want to "foster a competition" between the towns being considered and would instead help the company "reach a decision in their best interest." The Town Manager replied to the governor on January 19, noting that the township had approved a resolution in support of SB 854 (authorizing the Strategic Development Area).

The township also provided a copy of the development agreement it entered into with Wells REIT II-Cranberry Woods Development in connection with the Westinghouse site. It makes no reference to any incentives.

Conclusion

What is most significant about this deal is that Pennsylvania, despite its many existing subsidies and other technology programs, felt it necessary to pass special legislation that created an entirely new discretionary program to satisfy the needs of Westinghouse. That legislation amounts to an extension of the Keystone Opportunity Zone program (basically an aggressive enterprise zone) and is not specific to high-tech industries. The Opportunity Grant the company received from the state is also not limited to high-tech companies. As in the Battelle deal in Maryland, it appears Pennsylvania's array of tech-oriented incentives played no role in this deal.

The Strategic Development Area program, by automatically inserting the Governor into the process, basically obviates local negotiations. Once the township approved the designation of the Area, Westinghouse apparently had no real need to negotiate with the candidate towns.

More broadly, this costly deal was not widely debated or scrutinized, perhaps because it clearly plays to one of the region's sectoral strengths and involves a longstanding employer. The muted debate meant that 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. To his credit, Gov. Rendell intentionally discouraged a bidding war within the Pittsburgh region, something that cannot be said of his North Carolina counterpart in the following two cases.

North Carolina Case Study: Dell (Winston-Salem)

In 2004 North Carolina rolled out the red carpet when Dell, then riding high in the computer business, was looking for a location for a new assembly plant. The state ended up providing an astounding \$242 million subsidy package for the company, and then allowed Dell to stoke competition among localities and wrest another \$37 million from local authorities.

In October 2009 it became clear that all that was for naught as the company announced that it would close the plant after only four years of operation. It turned out that lucrative subsidies were not enough to prevent Dell from deciding to turn its production over to outside contractors operating in Mexico and other low-wage locations.

The Company

Dell Inc., the company that revolutionized the way personal computers were produced and distributed, has been struggling to adapt to a world moving away from desktop machines. Based in Round Rock, Texas, the company had 2008 revenues of about \$61 billion.

Fear rippled through north-central North Carolina in September 2008 when word leaked that Dell Inc. was trying to sell “most and possibly all” of its factories over the next 18 months.³⁷ Six months later, the harsh realities of a rapidly changing personal computer market materialized: Dell began the first of two rounds of layoffs at its Winston-Salem plant. By May 2009, Dell employment in Winston-Salem stood at just 1,140, down from 1,400 in January.³⁸

Then in October 2009, after only four years of production, Dell announced the facility would close, dislocating the last 905 employees. The company's Trade Adjustment Assistance petition stated that the “work will be given to third-party providers who operate in Mexico and other countries around the globe.”³⁹

Just five years earlier, the company had arrived in the Triad region (Winston-Salem-High Point-Greensboro) with the promise of creating “1,500 jobs.” The assembly facility had been subsidized with an unprecedented \$242 million economic development incentive package from the state and a \$37.2 million package of local subsidies from Winston-Salem and Forsyth County.

The layoffs and shutdown came as no surprise to close observers of Dell, a Fortune 100 firm founded in 1984. The company, which assembled desktop PCs in North Carolina, had lost its marketplace leadership to firms with better laptop entries long before the current recession. Indeed, 2004—the year Dell's top officials won massive tax concessions from North Carolina to locate its third U.S. manufacturing facility in Winston-Salem—was the company's last high growth year (20 percent-plus increase in sales). By 2008 its profits had fallen to \$2 billion on \$61.1 billion in sales, less than the \$3 billion in profits earned on \$49.1 billion in sales in 2004.

These 2009 marketplace realities were of little consolation to local officials, who demanded after the layoffs were announced that Dell representatives appear before both the county and city councils to explain the job-creation shortfalls.⁴⁰ After the shutdown announcement, public outrage prompted officials to scramble to recoup as many of the tax breaks as they could.⁴¹

Long gone was the jocularly that prevailed at the plant's October 2005 groundbreaking ceremony, when Gov. Michael Easley presented CEO Michael Dell with a ceremonial plate decorated with the state seal. “I got it out of the [governor's] mansion,” Easley quipped. “After dealing with this group and this region on this project, it's all I had left.”⁴²

The Deal as Reported by the News Media

North Carolinians learned their state was competing for a “computer-related company” on June 10, 2004 when the Triad Region’s *Business Journal* reported that Forsyth County had applied for a job training grant from the Golden Leaf Foundation, which had been created with state tobacco settlement money to foster economic development. The grant was to help lure an “unidentified company.”⁴³ Robert Leak, president of Winston-Salem Business Inc., confirmed that the grant was for \$41 million over ten years. The plant was dubbed “Project Merlin.”

Two weeks later, the *Business Journal*’s capital bureau confirmed that Gov. Michael Easley had gotten personally involved by meeting with Dell Inc., the previously unnamed suitor. “Although other Triad counties might be considered for the plant, state-level sources said that the company appears to be focusing its inquiries on Forsyth County,” the story said.⁴⁴

From that point forward, news reports in the region focused public attention on the idea that their political leaders were engaged in a fierce bidding war with unnamed competitors. “County Competes for Dell,” the page one headline *Winston-Salem Journal* headline screamed in mid-June. “Competition for project to be stiff, officials warn,” the subhead cautioned.⁴⁵ Dell refused to comment on its plans. The *Business Journal* returned to the story in August when it reported that Dell was “eyeing more than one Triad suitor.” The story recounted an Oklahoma bidding war for a Dell call center, and suggested “free land and abatements” were standard for landing a Dell facility.⁴⁶

Despite these early signals that the state was engaged in a major effort to lure a Dell manufacturing plant, the Department of Commerce kept the negotiations almost entirely out of the news until late October. The only inkling of the magnitude of the subsidy package came from a brief Associated Press report in July pegging the package at \$109 million, which was picked up by the local paper in Winston-Salem but nowhere else.⁴⁷

Then, a fortnight before the November 2004 general election (at which he stood for re-election), Gov. Easley called a special session of the General Assembly to consider major tax breaks for Dell. The session was set for two days after the election. The announcement set off a flurry of news reports and editorials. At least one story focused on the low projected pay of the jobs (average wage \$23,000 to \$27,000) and legislators’ inability to get details about the package until the last moment.⁴⁸

Again, most of the coverage focused on the bidding war. It was left to columnist Jeff A. Taylor at the *Carolina Journal* to express the gnawing fear that the state was being taken for a ride. (The *Journal* is an online publication of the market-oriented John Locke Foundation, which has long criticized the state’s economic development efforts.) Dell needed an east coast plant, he argued, and the Triad region’s huge pool of displaced furniture workers were ideal for the computer assembly “screwdriver” jobs being created by Dell. “North Carolina may well have succeeded in paying millions for something the state could have had for free,” he wrote.⁴⁹ (The Triad is also an excellent shipping point for Eastern U.S. markets, served by Interstates 40, 77 and 85 and close to 95.)

But Taylor's story was too little too late. Special legislation creating unusual new tax breaks for large computer manufacturing facilities passed 33-15 in the Senate and 92-18 in the House on Nov. 4. The votes got less attention than Dell's decision on Nov. 9th to come to the Triad area.

Only then did the full scope of the state offer become known: not only did the legislation include a special tax break for large computer assemblers, but other state grants brought the total package to an estimated \$242 million over ten years, contingent on Dell hiring 1,200 workers and investing \$100 million. "The stakes in this game are getting awfully high," the *Asheville Citizen-Times* editorialized.

But local attention had already turned to the second bidding war about to begin—between communities in the area. Davison, Rockingham and Yadkin counties dropped out of the race because they couldn't afford the subsidies. "There's a limit to what a corporation should get," said Guilford County Commission chairman Robert Landreth. "They can blackmail you to death sometimes."⁵⁰

The competition especially between Winston-Salem and Greensboro received major coverage. "They're saying 'Give us your best proposal,'" Greensboro City Council member Sandy Carmany said.⁵¹ "Winston-Salem is in this to win," Mayor Allen Jones told his city council, saying he had offered Dell \$28 million in tax breaks, "more than twice the amount offered by Guilford County and the City of Greensboro."⁵² Company officials, when contacted by the local press, remained cryptic on whether they had narrowed their choices. "Due diligence just takes a lot of time," Dell's spokeswoman said.⁵³

The local bidding war got statewide attention in mid-December with a major story in the *Raleigh News & Observer*. "The company is pitting Triad governments against each other, seeking millions of dollars in additional incentives before choosing the site of its third U.S. plant," the story said. It focused on "demands" in "hidden documents none would reveal" for water, sewer and road subsidies, free land and property tax abatements. Local officials found the process "distasteful" and at least one blamed the state government for fostering the competition. "This has been like asking the kids on a playground to police themselves with no teacher around," said Greensboro mayor Keith Holiday.⁵⁴

On December 21, the Winston-Salem City Council approved a \$37.2 million package of tax breaks and grants for Dell, and the next day the company made its decision to locate on a vacant parcel of land in the city that had been assembled specifically for the project. Its offer bested Davidson County (\$23.1 million) and Guilford County (\$12.5 million).⁵⁵ It was only after the announcement was made that a local paper revealed the intense lobbying by local officials desperate to win a new factory for their economically hurting region (the Triad area had lost 35,000 manufacturing jobs in the first half of the 2000s).⁵⁶

The local paper contrasted Winston-Salem's very public campaign with the losing bid by the third Triad city, High Point. "We signed a confidentiality agreement not to discuss this and we kept our word while these other communities were blabbing their mouths," said an obviously frustrated Mayor Becky Smothers of High Point.

Details from the Public Documents

From the moment Dell decided to locate a new manufacturing facility in North Carolina – a decision that appears to have been made fairly early in the process – company officials placed a series of escalating demands on government officials. From a state reeling from lost manufacturing jobs and desperate for major new employment opportunities, the Fortune 100 company demanded free land and buildings, zero taxes and fees, and subsidized training for its new employees. It even asked for relocation expenses for its top managers. When questioned by the local press about its intentions, the company’s official spokeswoman—the ironically named Michelle Blood—refused to comment. Privately, Dell threatened to look elsewhere if its demands weren’t met.

The process began in November 2003 when an intake officer in the North Carolina Department of Commerce received a call from Dell Inc. The company was looking to build a new manufacturing facility. The company asserted 15 states and Canada were in the running. The quality of the local workforce was “very important” to Dell, but so was the company’s plan to locate in a small metropolitan area so that it would be a dominant employer and not have to compete for the area’s most qualified workers. “Labor is #1,” the notes from the contact said.

A few months later, Dell officials began talking about locating up to three facilities in the state. Dubbed the F1TC project (later Project Merlin) by state officials, the company informed the state it was seeking a potential site for up to 700,000 square-feet of manufacturing, office and distribution space near an air hub.

From the outset, the company put North Carolina on the defensive about its chances of landing the plants and demanded massive tax breaks. The lead state official, without disclosing the name of the mysterious suitor, told one of the local economic development officials hoping to land the firm that the company had other North America options to choose from. The company “initially eliminated NC from search, but VP of Global Manufacturing added state back due to gut feeling that state could be creative and address wage differential concerns,” Susan Fleetwood of the state Department of Commerce wrote in an email to a Greensboro economic development official.⁵⁷

By late April 2004, the company and state had pinpointed the Triad region, perhaps because of its desire to “avoid tight labor markets.”⁵⁸ Company officials led by Kip Thompson, vice president for global manufacturing, took a two-day tour, organized by the Commerce Department. Local economic development groups and public officials paraded their tax-break wares. Lisa Perry of the Partnership for Economic and Tourism Development of Rockingham County offered a 100-acre site, fast-track permitting, and \$2 million to reduce company start-up costs. Winston-Salem offered a 65 percent tax break for ten years; a waiver of all fees; and a grant equal to 25 percent of local sales taxes. Duke Power offered half price electricity for the first year.

In early May, more offers poured in. Greensboro would build a 300,000-square-foot facility at no cost; help obtain job development grants; install infrastructure for free; and forgive all real and personal property taxes for ten years. Davidson County also offered

total tax abatement. “I feel this project is so important to the region that it requires extraordinary measures to insure the location in the Triad,” Steve Googe of the county’s economic development commission wrote to the state’s Fleetwood.

Dell, however, had bigger fish to fry than these relatively small local tax breaks. It wanted a massive tax deal with the state. On May 19, Commerce Department officials traveled to Austin for a daylong session with Thompson and other high-ranking Dell officials. Research universities were “less important,” notes from the meeting said. What was crucial? The North Carolina note taker jotted down the company’s demands. “Step 1 is to get to no taxes [emphasis in original]. Corp. income tax we don’t pay. Exemption from sales tax. Share sales taxes collected from customers . . . Look at ruboff effect – impact on others which is passed on to Dell.”⁵⁹

A week later, the North Carolina officials scheduled a follow-up call with Thompson, and then huddled to digest its implications. Again, the unsigned notes of the internal meeting reveal a company intent on maximizing its subsidies. “Kip perfect blunt. ‘If we made decision today, we wouldn’t come to N.C. – Here’s what it’ll take: 1. Free land; 2. Free building; 3. No taxes; 4 Training at \$5 million. . . I think the state will really have to step up and so will this community,” the notes said.⁶⁰

At the next follow-up meeting on June 4th, Thompson turned bombastic. According to commerce staff notes, he lamented the U.S.’s lack of competitiveness. “(I) spend a lot of time outside of this country. . . think we’re on the brink of a crisis . . . other countries get it. I’m afraid we’re going to get whipped in econ. – not in war,” the notes said. But, “we truly want to continue in this country. If we can’t get states to get creative . . . we could have said here’s the number, but I know you couldn’t hit the number – so invited you to be creative. If you have another way of monetizing it . . .”⁶¹

The following month, Thompson escalated his campaign for lower taxes in a meeting with James Fain, the state’s Secretary of Commerce. “We’d be better off in Texas & Tennessee,” he said on July 9th. “Can you be competitive with status quo? Shocks me you can’t. Tax burden is higher. Total cost is higher.” And again on the 15th: “I don’t think NC wants us . . . they have no interest in going to the next level to see what can be done. . .” The note taker then wrote down: “Lots of pauses.”⁶²

The next day, Dell Inc. vice president James Fitzgerald threatened to pull out unless the company got everything it wanted. “Thought we were going to get treatment of no taxes,” he said. “There are things about our business model that create tax issues. Not going to get there unless creatively addressed. You have got to really believe me – the tax cost is the death knell.”

Fain apparently realized that the level of subsidy Dell was demanding would require new legislation. So on July 28th, Fain brought Fitzgerald and Thompson to the state capital in Raleigh to meet with Gov. Easley. The group later went to lunch at the exclusive Cardinal Club. The handwritten notes from that meeting suggest the governor told the Dell officials that he couldn’t go to the legislature “and get no taxes for X years.” “Gov did a good job,” the note taker added. At the end of the lunch, Thompson gave Easley

an autographed copy of Michael Dell's "Direct from Dell." But before leaving town, he expressed concerns to Fain that he was "wasting his time."⁶³

The next month Dell's single-minded focus on getting lower taxes bore fruit. Dan Gerlach, a senior advisor to Gov. Easley, outlined all the tax breaks being lined up for Dell. In an email to Thompson and Fitzgerald, he expressed hope that the jobs in North Carolina might pay as much as Dell's jobs in Ireland, which had turned out to be better paying than originally expected. "As you know, most deals in North Carolina that involve special legislation (and this offer is extra-special on that scale) are to attract jobs that pay about twice as much as the average Dell salary," he wrote.⁶⁴

He expressed misgivings in a private communication to Fain and Fleetwood. "How certain we are that these jobs are going to last awhile and that this action would not be similar to subsidizing textile jobs," he wondered. "This is a threshold issue."⁶⁵ As well, several legislators raised job quality issues the day before the special session, prompting state officials to approach Dell one last time for more details about the jobs.

Dell gave the legislators a non-response response. "Our salaries and wages are competitive and vary with skills, experience and education required for each job level," Cindy Oaks of Dell emailed Fleetwood on the day of the vote. Fleetwood turned around and assured legislators who had raised the issue that Dell offered a good benefits package. Rep. Verla Insko, who had triggered the exchange, gave the governor "credit for working with a company that has a good track record."⁶⁶

The special North Carolina tax-credit bill designed for Dell soared through the legislature in the two-day special session in November. There is no evidence in the North Carolina state files or in contemporary news accounts that Dell ever seriously negotiated with another state to locate a plant that would service the east coast of the U.S.

Once the deal with the state was announced, Dell turned its attention to the competition among localities in the Triad. A request for proposals, put out on Nov. 10th with responses due back by the end of the month, said Dell was seeking "donation" of 100 to 150 acres; \$5,000 per head job training reimbursement; abatement of all property, business and service taxes for 15 years; roadway and traffic infrastructure improvements; no fees; a temporary office for 15 people complete with telephone and internet access; employee relocation assistance; support for a foreign trade sub-zone designation; and "any other economic development incentive the Location wishes to include."⁶⁷

Press accounts from the time suggest that local officials chafed at being played against one another.

Conclusion

In a national economy that has been hemorrhaging manufacturing jobs, landing a factory with over 1,000 jobs is truly a trophy deal. Yet North Carolina had a lot to offer besides tax breaks: a central location on the East Coast, service by numerous Interstate highways,

and low taxes. Hammered by the decline of its traditional manufacturing base in furniture and textiles, the Triad region also had a lot of unemployed (and underemployed) skilled workers ideally suited for the new jobs.

But that very economic weakness, coupled with a governor up for re-election, made the Triad region and North Carolina a soft target for a company aggressively looking to avoid taxes.

North Carolina could have insulated local officials in the hard-hit Triad region from Dell's demands for the abatement of local taxes. Yet by allowing the company to play localities against each other, the North Carolina Department of Commerce enabled a deal that stressed the tax base of an already depressed region. Now, although local governments will apparently claw back at least some of their tax breaks from Dell, they have lost more than 1,400 jobs and the tax base they would have generated—at a time when home foreclosures and other layoffs are already depressing revenues.

North Carolina Case Study: Google (Lenoir)

Behind Google's spare online image is an operation that requires massive amounts of electricity to run its data centers, which are also known as server farms. In 2007 the company decided to build one of those facilities in Lenoir, a town in a part of western North Carolina that has not recovered from the loss of thousands of furniture manufacturing jobs over the past decade. Despite the company's vast wealth, it did not hesitate to extract a subsidy package worth some \$260 million from the struggling region and from the state.

The package generated some controversy when it came to light after a secretive negotiating process, but by then the deal was pretty much a *fait accompli*.

The Company

Google Inc., the Mountain View, Calif.-based Internet search giant, is the leading brand name in cyberspace. Founded just 11 years ago, Google has grown at an exponential rate by tying a full range of Internet-based advertising, information and communications services to its core search function, whose near-monopoly status turned the company's name into a verb. Google earned \$4.2 billion on \$21 billion in sales in 2008, up from \$400 million in profits on \$3 billion in sales just four years earlier.

Virtually all of Google's revenue comes from online advertising. Its revenue stream is already more than half the size of the entire newspaper industry, whose ad revenues

shrank 16.6 percent to \$37.9 billion in 2008.⁶⁸ Though it counts almost no journalists among its 20,000-plus employees, Google's ad revenue will surpass that of all newspapers combined within three or four years if present trends continue. As of June 30, 2009, Google's market capitalization stood at \$134 billion, making it the tenth most highly valued firm in the U.S., rapidly closing in on AT&T, IBM and Warren Buffett's Berkshire Hathaway.

In sharp contrast to its enormous public relations efforts around new software products, Google cloaks its physical infrastructure in a shroud of secrecy. Its corporate website lists 22 U.S.-based headquarters, technology and sales offices and 50 similar facilities in 33 foreign countries. But it makes no mention on its website of either the number or the locations of its rapidly proliferating data centers (server farms). Its annual 10-K report to the Securities and Exchange Commission also is mum on the subject, stating only "we also operate and own data centers in the United States, the European Union and Asia pursuant to various lease agreements and co-location arrangements."

But industry observers are keenly aware that the company's future prospects hinge on its computing capacity. Writing in *Information Week* in 2006, industry observer Thomas Claburn noted that "Google is clearly on a server farm building splurge."⁶⁹ One financial analyst estimated that the company operated at least 36 server farms worldwide as of August 2008,⁷⁰ including the Lenoir, North Carolina facility profiled here that was announced in 2007.

While the server farm network serves primarily as a rapid parallel processing system for search engine requests, it is also designed to be a "virtual" hard drive for the entire globe. Google's expansionist vision puts it at the center of so-called "cloud computing," where Google servers would become the centralized storage system for every computer user's personal information, even as they remain the primary repository for indexed copies of every publicly posted web page.⁷¹ If the company achieves its lofty goals, dozens more communities in the U.S. and abroad will become home to Google-owned and operated server farms.

The Deal as Reported in the News Media

On Jan. 19, 2007, Google Inc. announced its decision to build a \$600 million internet processing center in Lenoir, the seat of depressed Caldwell County in western North Carolina. Local and state officials hailed the decision. The new facility promised to bring an estimated 210 jobs to a region that had lost nearly 5,000 furniture manufacturing jobs over the previous decade. "This company will provide hundreds of good-paying, knowledge-based jobs that North Carolina's citizens want," North Carolina Governor Mike Easley said in a statement.

But the 13 months of secret negotiations that led up to the announcement and the estimated \$260 million incentive package for Google left many observers fuming, and generated as much anger as praise for the officials who landed the high-tech prize. "We

have given away the farm and have gotten almost nothing in return,” concluded Lenoir City Council member T.J. Rohr.⁷²

The first sentence of the *Charlotte Observer*’s coverage of the announcement noted the tax break “brought into full view the price of pushing a struggling community into the 21st century.” The paper forced local officials to defend their gifts to the highly profitable firm. “It was either offer these kinds of incentives or lose out on the whole deal,” Lenoir mayor David Barlow told the paper. “How do you measure the good-paying jobs and what they’ll do for the local economy? Lenoir needs a new identity. It’s been known for furniture forever, and furniture has left us. We’ve got to get diversification.”

Within days of the deal’s announcement, North Carolina newspapers began what would become a month-long series of stories skewering both the secretiveness of the negotiations and the incentives attached to the deal. “Google tried to silence lawmakers” in Raleigh who had been pushed to offer a special sales tax break, the *Raleigh News & Observer* reported.⁷³ A front page story in the *Charlotte Observer* on February 9 noted there were no strings attached to the Google incentive package. It contrasted the Google incentive package to those offered Dell Inc. in Winston-Salem and to Google in Ann Arbor, Michigan, saying they generated far more jobs and at much lower incentive cost per job.⁷⁴

Other stories in the wake of the announcement exposed the lengths to which local officials had gone in assembling land for the company without letting local residents know the purchaser.⁷⁵ (To help clear the title on one parcel, a couple’s divorce expenses were paid.) Another story documented the hefty fees collected by local law and real estate firms from the transactions.⁷⁶

The role of Google’s site location consultants in pushing for ever-higher tax breaks for their client drew fire from lawmakers, some of whom argued such consultants should be registered and regulated as lobbyists by the state. The *Charlotte Observer* revealed that the chief consultant, Rhett Weiss of California-based Dealtex, was hired as a full-time Google employee during the negotiations. The paper also reported that North Carolina attorney Don Donadio of the law firm Womble Carlyle Sandridge & Rice, who had been hired by Google for the negotiations, once told a Raleigh newspaper that the firm received “in the ‘lower range’ of 15-20 percent of incentives they secure.”⁷⁷

The drumbeat of criticism forced local officials to respond. In mid-February, Lenoir Mayor Barlow and County Commissioner chair Faye Higgins published an op-ed in the *Observer* rejecting the notion they had been pressured into an unfair deal or dealt with heavy-handedly by Google. “We characterize our negotiations as tough and hard at times, but always fair, which are familiar characteristics to practically all people in business,” they wrote.⁷⁸

But the critics weren’t dissuaded. The following day, the *Observer* ran a story pointing out that state and local economic development officials never conducted an economic cost-benefit analysis of the deal, despite such studies being standard practice in the field.⁷⁹ A few days later, it became known that local officials had offered to extend a

property tax abatement for an additional 15 years without even a written request from Google.⁸⁰

Then, in February 2007, the *Observer* reporting team, thanks to North Carolina's public records law, analyzed public officials' emails exchanged during the negotiations. They revealed how Google repeatedly threatened county officials with pulling out of the deal if its terms weren't met. As late as September 2006, though county officials had already spent millions of dollars assembling and clearing land, they still didn't know how many jobs Google was actually promising to bring to Caldwell County. "No one should assume the company has selected the Caldwell site," snapped Donadio in a return email, the paper reported.⁸¹

A week later, the confidentiality agreements signed by state and local officials became public knowledge, explaining why the name of the company was never revealed during the 13 months of negotiations, even during two public hearings held to discuss tax breaks for the deal.⁸²

The uproar eventually led to national coverage of the Google deal. While the *New York Times* in mid-March highlighted the potential rebirth of an aging furniture-manufacturing town, its story also gave prominent play to local critics.⁸³ *Business Week*, on the other hand, focused exclusively on "the high cost of wooing Google." "Lenoir's courting of Google offers a case study of how elaborate the inducement ritual can get," it wrote. "Competitive anxiety compels the handouts: the fear that without lucrative enticements, companies will go elsewhere, and the bidding war is being escalated further by sophisticated corporate consultants expert at playing jurisdictions against each other."⁸⁴

In 2007 the North Carolina Institute for Constitutional Law filed a lawsuit in state court challenging the sales tax exemption granted to Google by the state.⁸⁵ In late October 2009 the North Carolina Court of Appeals heard arguments on Google's effort to get the case dismissed.

Details from Public Documents

The ability of a sophisticated consultant working for a high-profile company to manipulate state and local communities was on full display in Lenoir, public records reveal. From the very start, Google's representatives insisted upon total secrecy, raised the specter of interstate competition, promoted intra-state competition, and then, after a local site was selected, sustained fears of a collapsed deal if maximum tax breaks were not offered by both the state and local governments.

The process began in mid-November 2005 when Taliver Heath, using an unidentified gmail account, emailed the North Carolina Commerce Department about "a large, high technology company" looking to build a major data center. "We are looking at a number of locations across the country, but have some early indications that conditions may be favorable in North Carolina."

The company's "primary decision making criteria" involved access to and the cost of electricity, Heath wrote. But he also asked about communities with "favorable tax rates."⁸⁶ Two days later, in a conference call with department officials to discuss what tax breaks were available in the state, Heath said other areas under consideration for the facility included Delaware, Pennsylvania and "others out west."⁸⁷

The next month, Rhett L. Weiss of Dealtek, Ltd. arrived, representing the still unnamed Internet company. After some preliminary discussions, the state arranged a competition among eligible counties, which took place on Dec. 13, 2005 in the offices of Duke Energy in Charlotte. In a daylong session, Weiss and Arrakis Napius of Zenzu Consulting in Santa Clara, California heard presentations from Burke, McDowell and Caldwell counties.

In January, the consultants visited potential sites in Caldwell and Rutherford counties as the county-against-county bidding war continued. In February, Rockingham County offered full water and sewer to a site at no cost to the company, a 100 percent waiver of business personal property taxes and a 50 percent waiver of franchise taxes. The City of Lumberton offered 400 acres and 4.55 cents-per-kilowatt hour electric rates.

Caldwell County officials felt compelled to bump up their offer. In a letter sent Feb. 8, 2006, they promised to increase the exemption from all business personal property taxes and the 75 percent property tax abatement from 20 years to 30 years.⁸⁸ On Feb. 22-23, Weiss made his second trip to Caldwell County to scout out the site. This time, no other location was on the itinerary prepared by the North Carolina Department of Commerce.

However, someone told officials in Gaston County, which lies between Charlotte and Lenoir, that the beauty contest wasn't over. In early March, the executive director of the Gaston County economic development commission wrote Weiss a letter saying "we are in a position to move quickly." A week later, Weiss again returned to Caldwell County for a full day of discussions about the leading site. But he continued to promote the idea that the final decision remained up in the air. The next morning, his North Carolina commerce department itinerary included a quick visit to a Gaston County industrial park en route to the Charlotte airport for his trip home.

In early May, Weiss turned his attention to maximizing state tax breaks. The Google consultant requested a complete exemption from state sales tax on the computer equipment the company would be purchasing to equip the facility. Don Hobart of the commerce department wanted to do a state "fiscal impact" statement from the change. He asked Weiss in an email how much equipment would be included in the deal. "I'm not sure how this question is even arising," Weiss snapped back in an email. "This project will not be in NC if sales tax is accessed [sic]."⁸⁹

State officials by now knew they were dealing with Google. Weiss' email address was rhettw@google.com. The Dealtek intermediary role was gone. But the consultant turned employee continued to insist on total anonymity for Google.

Over the next month, Weiss worked closely with department officials to craft legislation exempting (or rebating) sales taxes not only on equipment but also on electricity

purchases. When a legislative drafter proposed a fiscal impact statement, Weiss emailed Commerce Secretary James Fain to question “the legislature’s odd requirement to show a hypothetical fiscal impact of losing illusory tax revenue that the state never would receive? Without the legislation being passed with its correct substance, our project will not proceed in North Carolina.”⁹⁰

State officials scrambled to meet the company’s demands. In late June, the state budget included the sales tax exemption as designed by Google. It passed without notice.

Meanwhile, the Commerce Department turned its attention to gaining a Jobs Development Investment Grant (JDIG) for Google, which would eventually turn into a \$4.77 million subsidy. At a special meeting of the department’s Economic Investment Committee (EIC), attorney Hobart said the company was so concerned about confidentiality and keeping the project secret that “it is presently weighing whether the risk of being unable to maintain confidentiality exceeds the benefit that could be obtained by applying for a grant.”

But the cat was soon out of the bag anyway. On July 21, the *Charlotte Observer* reported that Google had North Carolina’s Caldwell County on a short list of potential sites for a new computing center. The main attraction? Electricity at 4.18 cents per kilowatt-hour compared to twice that level in other parts of the country. Deep in the story, the paper revealed that the special exemption passed by the state legislature would save the company an estimated \$3 million a year in sales taxes.⁹¹ (Server farms use a great deal of electricity both to run the computers and to cool the facilities.)

When it eventually released its records from the negotiations, North Carolina redacted every mention of the amount of electricity Google planned to use at the site, making it impossible to estimate the value of the electricity sales tax exemption. Indeed, “A Report of the Economic Impact of a new Data Center on Caldwell County, North Carolina” prepared by Chester J. Pankowski for the Caldwell County Economic Development Commission was never completed, in part because the consultant couldn’t get all the data he needed from the company.

County officials by late summer began the arduous process of acquiring the land for Google. The mayor went door-to-door soliciting options on the 35 homes that would have to be purchased for the project footprint, the *Lenoir News Topic* reported in August. Even though the *Observer* had already reported that Caldwell County was in the running for a Google facility, the local paper would only report on community speculation about the new facility, ranging from a nuclear power plant to a Smirnoff Vodka plant.

In early November, the commerce department once again turned to the pending JDIG grant. Chief counsel Hobart wrote Google’s Weiss to ask for a firm commitment to the project. “It has been the EIC’s sound practice to make public awards of JDIG grants prior to or in conjunction with a company’s commitment to proceed with a project in the state,” Hobart noted. “As a practical matter, the date on which the public grant award is made typically serves as the date beyond which the state would no longer rely upon the confidentiality protections . . . as a basis for withholding public records.”

Google's Weiss, on the other hand, still wanted to delay that public announcement. On December 18, Caldwell County's Economic Development Commission held a public hearing on tax abatements for a mystery company called Tapaha Dynamics. The abatement voted at the meeting was now up to 80 percent for 30 years. Caldwell County was in competition with "not only other [jurisdictions] in the United States but throughout the world," one commissioner said. Google got the larger abatement.

The following day in Raleigh, the state Commerce Department's EIC held a close-door session to consider Google's JDIG application. Stewart Dickinson, a member of the committee, complained the company's paperwork was "significantly different from others for which grants had been awarded under the program in terms of the volume of asserted trade secret data." Fain drily noted that Caldwell County officials had just voted a massive tax abatement without publicly releasing the company's name.

Weiss was then invited into the room. "Any decision by the company to locate activity in one location over another is weighted heavily on competing factors," he told the EIC. He conceded the company might be willing to make its commitment within a week if it got the grant. Yet he couldn't resist the temptation to make one last demand for an extra year to meet its job creation requirements (80 percent of the 212 jobs promised in the application within 12 years).

Three days after Christmas, the EIC met one last time to consider the Google application, approving it unanimously. The next day, the citizens of Caldwell County finally learned that Google was their mystery suitor. "A mystery no more," the *News-Topic* said in reporting the state's decision to give the \$4.77 million JDIG to the Google project.⁹²

Conclusion

The irony of giving massive tax breaks to a highly profitable, high-technology company was not lost on local pundits. After the *Raleigh News & Observer* reported the deal would top \$100 million for the 212 jobs (the package is now estimated at around \$260 million),⁹³ columnist Scott Mooneyham bitterly decried the hypocrisy of business leaders who demand high-performing schools while avoiding paying taxes, citing Google CEO Eric Schmidt's \$90 million in 2005 stock options versus the lost property tax revenue for local schools.⁹⁴

Throughout the 13 months of negotiations, Google insisted it had proprietary reasons for insisting the talks be kept secret. But Google is a near monopoly in its niche. Its demand for secrecy put the communities within North Carolina into a classic "prisoners' dilemma," forcing them to engage in a bidding war against one another.

The state's commerce department was the enabler of this bidding war. Should it be excused because it feared competition with other states? That threat—made from the very outset by Google—appears refuted by the real driver of its location decision: cheap electricity—a commodity North Carolina in general and Caldwell County, which had lost

5,000 manufacturing jobs in the past decade, had in abundance.

In late December 2006, just as negotiations were reaching their final crescendo in North Carolina, a South Carolina newspaper carried a report that Google was considering a \$750 million, 400-job investment in that state.⁹⁵ Was this the feared out-of-state competition? No, today, both facilities are up and running.

Google's need to build server farms both in the U.S. and across the globe continues unabated. These expansion needs make it an ideal target for a multi-state compact among public officials against tax-break competition.

New York Case Study: Advanced Micro Devices/GlobalFoundries (Malta/Stillwater)

After an unknown period of wooing, upstate New York landed a trophy deal in 2006: a new micro-chip fabrication ("chip fab") plant in Saratoga County by Advanced Micro Devices (AMD). The incentive package totaled a remarkable \$1.2 billion for about 1,200 jobs, or \$1 million per job. Among the subsidies: the project was granted Empire Zone status under a rule that enables projects outside traditional, distressed zone areas to qualify.

The deal then wavered for three years as AMD struggled financially, received an equity infusion from a new foreign partner, and created a new entity to which the facility incentives were transferred. The project finally broke ground in June 2009, with full staffing levels not expected until early 2014.

The Company

The deal was initiated by Advanced Micro Devices Inc. (AMD), the second largest producer of semiconductors, though it lags far behind industry leader Intel in market share. AMD, which had \$5.8 billion in revenues in 2008, sold its chip fab business to Abu Dhabi-based GlobalFoundries, which inherited the subsidy package.

The Story as Reported by News Media

On June 2, 2006 the Albany *Times Union* broke the story that state officials were putting together a \$1 billion incentive package to lure AMD to the Luther Forest Technology Campus, which occupies 1,350 acres in the Saratoga County towns of Malta and Stillwater.⁹⁶ AMD would build a \$3.5 billion semiconductor fabrication plant that would employ up to 1,000 people. AMD and economic development officials would not comment, but then-State Senate Majority Leader Joseph Bruno (in whose district the facility would be located) confirmed that AMD was considering the deal.

There were soon reports that AMD was also looking at other sites, including one in Marcy, New York, outside Utica.⁹⁷ In an article seven months later, the *Times Union* reported that AMD had looked at 14 sites across New York.⁹⁸ As part of his high technology economic development strategy, then-Gov. George Pataki had eight years earlier targeted chip fabrication plants—or “chip fabs”—and designated 13 places in upstate New York as “shovel-ready” for them.⁹⁹ Chip fabs require a large footprint of land, a reliable supply of electricity, and a lot of water. (There were also later reports that New York’s main competition was Germany, where AMD already had chip fabs.)

When news broke of the possible project, the value of the state’s package reportedly rose to \$1.2 billion, including a capital grant of \$500 million, Empire Zone benefits of \$250 million, research incentives worth \$150 million and \$300 million in infrastructure assistance.

On June 23, just 21 days after the project was first made public, AMD and Gov. Pataki announced that the company had chosen the Luther Forest location and would receive the \$1.2 billion package. The New York Legislature approved the package later the same day. The project’s projected permanent job count was revised to about 1,200 so that the subsidies would total about \$1 million per job.

A July 13 article in the *Times Union* reported that economic development officials from the Capital Region had first approached AMD four to five years earlier.¹⁰⁰ The article said the “mission was facilitated by officials from Glimmerglass Ltd., a business development firm in Menlo Park, Calif., just outside San Francisco. Local officials, including [Ken] Green [president of the Saratoga Economic Development Corp.], Kelly Lovell, chief executive of the Center for Economic Growth in Albany, and LaMar Hill, a Capital Region consultant who previously was director of development for Albany NanoTech, met with Bill Siegel, a senior executive from AMD.” Green is said to have hired M+W Zander, a German engineering firm that has done extensive work for AMD, to assess Luther Park as a potential site for a chip fab AMD was planning.

The group later visited AMD’s plant in Dresden “and met with officials from Silicon Saxony, a consortium of German semiconductor companies, and heard about the economic incentives it takes to attract a chip fab. It was then that the local officials learned that a \$1 billion incentive package was the global standard for a chip fab,” the *Times Union* reported.

On July 28 the paper reported that Green’s Saratoga Economic Development Corp. had mailed an eight-page pamphlet touting the AMD project to residents of Saratoga County.¹⁰¹ The article suggested the mailing was designed to preempt possible opposition to the subsidies and the facility itself. On September 18 the *Times Union* ran a piece noting that there was no firm timetable for the construction of the chip fab by AMD and that the company’s agreement to do so was non-binding, though on October 21 the newspaper reported that company and state officials were working on a binding deal.¹⁰²

In October the board of the Empire State Development Corp. approved the largest part of the subsidy package—a \$650 million grant—and scheduled a public hearing

for November. At that hearing, speakers such as Ron Deutsch of New Yorkers for Fiscal Fairness questioned the wisdom of the subsidy package and the claim that the project would yield the \$1.5 billion in economic benefits. Others, including the Sierra Club, voiced concerns about the project's environmental impact. Nonetheless, in December the state Public Authorities Control Board approved the \$650 million grant. After the vote, AMD signed a grant disbursement agreement that gave the company a two-year window (through July 2009) during which to move forward with the project and apply for the grant.

Throughout 2007 the Capital Region waited for a ground-breaking, as AMD suffered disappointing financial results and rumors that it would be taken over. In June there were reports, confirmed by AMD, that the company was considering partnering with another company on the chip fab. In November, AMD announced that it would be receiving a \$608 million equity infusion from Abu Dhabi-based Mubadala Development Co. The following month, AMD secured an option on the land for the chip fab. Soon after that, the Saratoga County Board of Supervisors designated the Luther Forest Technology Campus an Empire Zone, setting the stage for another facet of the subsidy package.

Yet the uncertainty continued into 2008 as AMD failed to make a definite commitment to the project. In October 2008 AMD announced a new approach to the project: it had decided to sell its existing chip fabs to a new Abu Dhabi entity called Advanced Technology Investment Co., which would also be the majority owner of another new entity, The Foundry Co., that would build the new facility in New York. AMD, which would be a part owner of Foundry, proposed to transfer the planned subsidy package to the new entity.

In December 2008 the Public Authorities Control Board approved the transfer of the \$650 million grant to Foundry, which in March 2009 was renamed GlobalFoundries. The new company continued to receive cooperation from state and local officials in the transfer of AMD's approvals and subsidies. However, the company initially would not commit to using union labor in the construction of the facility, then valued at \$4.2 billion. Under pressure from the building trades, Gov. David Paterson's administration stepped in and negotiated a deal under which union wages would be paid by the general contractor, M+W Zander, and its subcontractors. It later came out that the state added \$15 million to the subsidy package for GlobalFoundries, apparently as an inducement for it to agree to the project labor agreement.

On June 15, 2009—three years after the deal was first announced—bulldozers finally began clearing land for the chip fab.

Additional Information from Public Documents

In response to a freedom of information request to the Empire State Development Corporation (ESDC), we received ESDC's Grant Disbursement Agreement with AMD, the company's Empire Zone application and some correspondence. None of the documents

cover the early time period during which AMD was considering where to locate the facility. Nor do any of them shed any light on the role of subsidies—significant or not—in AMD’s choice of location.

The Grant Disbursement Agreement provides for a grant of up to \$650 million for a facility with expected total project costs of \$3.2 billion (including \$2.6 billion for machinery and equipment), with a completion date at the end of 2014. A minimum of 1,205 new full-time employees were expected to be hired by January 2014, and retained each year through 2021. No wage requirements are stated. The agreement puts the net fiscal benefit to the state government at about \$145 million, and the economic benefit to the state is estimated at about \$1.47 billion.

A December 3, [2007] letter from the ESDC to the Saratoga County Empire Zone Administrative Board gives the board permission to grant the AMD project Empire Zone benefits as a “regionally significant” manufacturing project even though it is not located within the boundaries of a zone. Such non-contiguous expansions of Empire Zones away from distressed areas have been a recurring source of controversy in New York State.

Conclusions

Local officials in the Capital Region would argue that this situation shows the virtue of patience, especially when reeling in a big fish. It took three years after the deal went public (after an unknown length of site location and recruitment time prior to that)—and a transformation of the company involved—but it appears that a chip fab is indeed going to come into existence in Saratoga County. However, neither state nor local officials have satisfied critics who say that spending \$1 million per job is too high a cost for the benefit involved.

This is an especially salient criticism for a chip fab, which does not usually have a large accompanying research and development staff, etc. Chip fabs are extremely automated facilities. Like many high-technology facilities, chip fabs typically display a wage-distribution curve shaped like a dumbbell. Unlike, say, an auto factory where the wage curve would look like a bell curve (a few low-wage jobs, lots of middle-income jobs, and a few highly-paid management jobs), a high-tech “dumbbell” wage profile includes a substantial number of low-wage jobs (such as lab technicians in clean rooms), relatively few middle-income workers, and a substantial number of well-paid engineering and managerial positions. None of the documents reviewed for this case study provided information on the plant’s projected wage distribution.

Ohio Case Study: Amylin Pharmaceuticals Inc. (West Chester)

Biotech company Amylin Pharmaceuticals initially received modest incentives to open a manufacturing facility in Ohio for its Byetta synthetic insulin and later got a much bigger subsidy package when it decided on a major expansion of the plant.

The eagerness of two administrations to land the investment probably led the state to offer too much to a company with a single product that was highly motivated to choose the site because of its proximity to a critical manufacturing and technology partner.

The emergence of another competitive product increases the risks for the project.

The Company

San Diego-based Amylin Pharmaceuticals Inc. is a publicly traded biotech company with about \$840 million in annual revenue.

Amylin is a relative rarity in the world of biotechnology: It's a company with a marketable drug. There are over 1,450 companies in the Biotechnology Industry Organization, yet less than a tenth have Food and Drug Administration-approved products. Indeed, there have been just 200 FDA-approved products from the entire biotech industry over its 30-plus-year history, and most of the industry's \$75 billion in sales in 2007 came from just a handful of industry giants like Amgen, Genentech, and Genzyme.

Founded in 1987 to research treatments for diabetes, Amylin with its 1,800 employees is essentially a one-drug firm. The FDA approved Byetta (exenatide) in April 2005. It is an injectable synthetic version of a naturally-occurring protein that promotes insulin production in people with type 2 diabetes.

However, the drug was only approved as adjunct (additional) therapy for patients whose blood sugar isn't controlled with existing oral medications like metformin, and it was cautiously greeted in the medical literature. A July 2007 review in the *Journal of the American Medical Association* concluded that while the new class of medicines that included Byetta had "modest efficacy and a favorable weight change profile . . . continued evaluation in longer-term studies and in clinical practice are required to determine the role of this new class among current pharmacotherapies for type 2 diabetes."¹⁰³

Sales growth quickly hit a plateau. In the first half of 2009, Byetta accounted for \$333 million or 83 percent of company revenue, virtually unchanged from a year earlier. The company's sales effort—it jointly marketed the drug with Eli Lilly—was also set back

when a rival product in its class entered the market. Merck's Januvia (sitagliptin) is a small molecule drug, which has the advantage of being orally administered. It received FDA approval as a primary therapy for type 2 diabetes in October 2006.

Despite having a marketable drug, the company still lost \$42 million on \$403 million in sales in the first six months of 2009. That compared with a loss of \$84 million on \$379 million in sales in the first half of 2008.

Amylin has long understood that its first-mover advantage in this new class of medicines wouldn't last long. As early as 2000, it had begun reengineering the protein so it would stay in the blood stream longer. This would be a significant improvement for a medication that had to be taken intravenously every day. It conducted this research through a partnership with Alkermes, a Cambridge, Massachusetts-based firm that has proprietary technology for developing long-acting versions of protein-based biologics. Alkermes' sole commercial manufacturing facility is in Wilmington, Ohio (which is just 40 miles from West Chester).

In July 2009, Amylin submitted a new drug application to the FDA for its once-weekly version of Byetta. While there are always some regulatory uncertainties at this stage of the drug approval process, because the two drugs are very similar, approval is likely within a year. The company completed an expansion of manufacturing and distribution capacity at its West Chester, Ohio site in mid-2008 in order to hit the ground running when FDA approval for Long-Acting Byetta is secured.

The Story as Reported by News Media

Amylin's foray into Ohio took place in two stages. In late 2005, the company announced it would locate a new manufacturing facility with 52 jobs in West Chester, Ohio. "Butler County beat out northern Kentucky and three other states," the local paper chirped in announcing the deal, which involved \$3 million in state and local incentives, including an 8-year, 75 percent personal and tangible property tax abatement for the \$70 million investment.¹⁰⁴

Reporters in Amylin's hometown of San Diego took note. The decision to begin manufacturing in Ohio was "about having greater control over the product and being close to a partner in the complicated manufacturing process," Amylin chief financial officer Mark Foletta told the *San Diego Union-Tribune*. However, he did add that "the tax breaks certainly didn't hurt."¹⁰⁵ An Amylin press release issued a week later confirmed that "this new facility is strategically located near our technology partner Alkermes, which will facilitate technology transfer and allow for additional support as we move forward," chief executive officer Ginger L. Graham said.

The first public inkling that Amylin planned a major expansion at its new site came from newly-elected Ohio Gov. Ted Strickland, who mentioned during a speech at Dayton's Sinclair Community College in late March 2007 that a \$400 million investment by "a major pharmaceutical company" may be coming to Ohio. He declined to name the

company. When reporters contacted Amylin because it was the likely prospect, a company spokeswoman confirmed the company was looking to expand but “we have a lot of different options, and we’re talking to a lot of people.”¹⁰⁶

The southern Ohio press did not follow up on that comment or publish any reports that a bidding war was underway. Nor was there press coverage in other cities or states suggesting other communities were being asked to bid for the expansion.

On May 3, 2007, the *Cincinnati Enquirer* announced in a front page story that Amylin planned to add 500 jobs at its West Chester facility.¹⁰⁷ There was no mention of tax incentives in the prominently placed if relatively brief article. It wasn’t until six months later, on Nov. 6, the day after the dedication ceremony at the expanded facility, that the press reported the state provided \$46 million in tax breaks for Amylin. The project “was no slam dunk. This was a real competition” involving several states in the Southwest, Lt. Gov. Lee Fisher told the *Enquirer*.¹⁰⁸

Details from the Public Documents

The state subsidy package included far more than tax breaks and totaled more than twice the \$46 million reported at the dedication event. Combined with several kinds of local incentives, state records indicate that the total subsidy package came to \$117 million. Here is the sequence of events based upon state files.

Amylin contacted Ohio officials sometime in late 2005 about locating its first manufacturing facility in the state. Lt. Gov Bruce Johnson, in his last year of office along with Gov. Bob Taft, took the lead. On Nov. 4, 2005, Ohio offered the company \$2.4 million in various incentives as part of Amylin’s plan to purchase an existing 151,200-square-foot plant in the southern corner of the state that would house 52 manufacturing jobs. Amylin estimated its investment in West Chester would total between \$70 and \$84 million. Johnson’s letter noted the state’s commitment was based on the understanding that “Amylin is also considering an alternative location in northern Kentucky.”¹⁰⁹

Just three weeks later, Johnson sent a second letter to Scott Tarney of PricewaterhouseCoopers LLP in Columbus, which was operating as one of the company’s site location consultants. The revised incentive package now had an estimated value of over \$3 million.¹¹⁰

The following month, the Butler County Commissioners voted 3-0 to designate an enterprise zone for Amylin and granted the firm an eight-year, 75 percent abatement on all real and personal tangible property taxes on its investment. The average wage of the jobs would be \$52,700 the ordinance noted, with a total annual payroll of \$2.7 million. The January 18, 2006 commitment letter from Amylin’s corporate controller Laura Clague to Johnson confirmed the “understanding of our proposed project, as follows: \$70 million investment in a pharmaceuticals manufacturing facility; 52 new jobs.” This commitment letter made no mention of competition from northern Kentucky.¹¹¹

Nine months later, the company began sending signals to state officials that bigger plans were afoot. On Oct. 1, 2006, Amylin applied for \$150,000 from Ohio's Investment in Training Program to supplement 50 percent of its job training costs at its factory. Three weeks later John Pratt, the facility's general manager, complained the company was "having a little difficulty" filling its production jobs.¹¹²

That set the stage for the company's major presentation to the Ohio Department of Development on Oct. 27, 2006. Pratt, Diana Reed, a senior public affairs executive from San Diego, and Tarney from PricewaterhouseCoopers told the state that the firm was considering a major expansion at its West Chester site with the potential for 561 jobs and an investment of \$410 million. But the company said it was also looking at "several Southwestern states."¹¹³

Therefore, the company needed assistance, which it opportunistically listed as its number one location criteria. "We need to explore all existing programs available in Ohio as well as explore any potential creative opportunity," they said. Other factors that would weigh on the decision included real estate costs, labor market conditions, operating costs, utility services and costs and the availability of a trained work force. (These business basics, which far outweigh taxes as cost factors, are normally the dominant determinants for locating expansions and relocations.)

Two weeks later, Lt. Gov. Johnson sent Ginger Graham, the chief executive of Amylin, a letter pledging \$16.8 million in state tax breaks and incentives if the company would invest another \$410 million in Ohio.¹¹⁴ (The Taft administration was term limited, so Taft and Johnson were by now lame ducks, Ted Strickland and Lee Fisher having been elected governor and lieutenant governor, respectively.) On Dec. 6, 2006, Johnson upped his offer to Amylin to \$73 million in state incentives. "This preliminary commitment of assistance is based on the assumption the company would invest \$410 million, create 500 new jobs, retain the 52 old jobs, and that "the State of Ohio is in competition with undisclosed sites in the Southwest United States for this project," he wrote.¹¹⁵

Governor-elect Strickland and Lt. Gov.-elect Fisher didn't question the escalating price tag. "Your proposed expansion is a very high priority for us," Strickland wrote to Amylin CEO Ginger L. Graham on December 14; he designated Fisher as the chief contact for the state. The package was clearly a bi-partisan affair. In late January, Ohio dignitaries toured Amylin's West Chester facility. The state brought along U.S. Rep. John Boehner, the local Congressman (who happens to reside in West Chester), while CEO Graham came from San Diego for the event.

The economically depressed state was an easy mark for Amylin's advocates. The company hired Dinsmore & Shohl, a white shoe corporate law firm in Cincinnati, to represent it in negotiations. Richard Tranter, a Dinsmore partner, emailed state officials in early February asking for "the entire list of incentives that can be offered by the Department of Development," including those not already offered. "Indicate why Amylin has not been able to access them. Please list the statutory or administrative barriers," he wrote.

By the time Graham, bumped up to chairman of the board, and her successor as CEO, Dan Bradbury, visited West Chester in late February, Lt. Gov. Fisher was ready with another offer. The state would come up with \$30 million in loans and grants to help finance the expansion, and the incentive package was increased to \$98 million with “significant investments in workforce recruitment and development.”¹¹⁶

The local part of the offer came two days later. The Butler County Commissioners announced: \$26 million in enterprise zone tax abatements (100 percent for 10 years for up to \$100 million in construction); \$6.5 million in creative lease financing with the Port Authority; \$1.5 million in highway improvements; \$1.4 million in water and sewer improvements; and \$220,000 for fiber optic access. Coupled with the state offer, the package was now up to \$117 million. “The state of Ohio is in competition with two unnamed states for Amylin’s proposed project,” the County letter dutifully repeated.¹¹⁷

Less than two weeks later, Lt. Gov. Fisher pressed Bradbury and his chief financial officer, Mark Foletta, for a definitive answer while they were visiting Columbus to discuss details of the expansion. He wanted the governor to be able to announce it at his state-of-the-state address a few days later. The morning of the address, Bradbury responded with a long email saying “we are continuing with our plans to potentially make substantial additional investments in Ohio” but “we have certain business issues to work through, including detailed work plans and incentive and financing structures.” He did allow Strickland to say that “Amylin is planning to increase the scope of its investment in Ohio.” But without a firm commitment, the governor left it out of his speech.

There’s little evidence that Amylin was looking anywhere else. Indeed, on March 23, a local reporter who routinely checked property transactions in the county discovered that Amylin had purchased a large site next to its existing plant. After Gov. Strickland gave his speech at Sinclair Community College less than a week later (the first public hint of the expansion), the *Dayton Daily News* reported the governor said Arizona was no longer competing for the project.¹¹⁸ On the other hand, the *Cincinnati Enquirer’s* story on the same event quoted a company spokeswoman saying “we have a lot of different options, and we’re talking to a lot of people.”¹¹⁹

The lack of finality helped Amylin escalate its demands. In early May, CFO Foletta told Fisher that Amylin was prepared to accept the state offer, but it wanted all the job training and site preparation grants severed from any equity investment requirements and it wanted work to begin on the \$26.5 million in low-interest loans for construction.¹²⁰

The state accepted. The next day, the press reported the company’s planned expansion.¹²¹ The local incentive package wasn’t voted on by Butler County for another six months, even though construction was well underway. The company received a 10-year, 75 percent abatement. The ordinance did have a clawback provision, however: if the company fails to reach 75 percent of the 450 projected new jobs over any three-year period, it will trigger a requirement that the company pay its property taxes in full for that period.

In April 2008, as the new plant neared completion, Amylin nailed down the final piece of its incentive package. It wanted the state to float a \$26.5 million bond issue to finance machinery and equipment for the new distribution center.¹²² The loan the state assembled included \$15.3 million from its Research and Development Investment Loan fund, even though there was no indication that Amylin planned to carry out new product R&D at the site. The contract called for the company to spend at least 15 percent of the money on R&D-related equipment.

Conclusion: A Big Subsidy for a Risky Deal, Based Upon an Unverified Competition

It's easy to understand why state and local officials were excited about the prospect of landing a high-tech biotech firm for economically depressed Ohio. But their bi-partisan desperation prevented them from questioning Amylin's claim of competing locations. That Amylin's critical manufacturing and technology partner Alkermes was located just 40 miles away in Wilmington certainly made southern Ohio a compelling site, if not the most competitive location, for the plant. The failure of the local press to investigate the alleged bidding war made it easier for the company to get the state to up the ante.

The state's desperation also apparently prevented officials from questioning why the cash-strapped company openly insisted on a soup-to-nuts package of every available kind of subsidy. Though they won the deal, Ohio and Butler County agreed to place a lot of taxpayer eggs in an inherently risky basket. The Ohio jobs are almost entirely dependent on the fate of a single product. In November 2008, Amylin announced a 25 percent reduction in its San Diego workforce as it scaled back R&D activities. With no other product to fall back on, any stumble in the rollout of Long-Acting Byetta could put both the taxpayers' investment and the region's 400-plus jobs at risk.

Even as this is written, new storm clouds are appearing on the horizon. On July 31, 2009, the FDA announced its approval of a third competitor in this new class of drugs that stimulate insulin production in diabetics. Bristol-Myers Squibb's Onglyza (saxagliptin), like Merck's new Januvia, is an oral medication. After Amylin's once-a-week injectable is approved, it will be up against two deep-pocketed, Big Pharma rivals.

Maryland Case Study: Battelle Memorial Institute (Aberdeen)

Battelle, a non-profit research and development corporation, received multiple subsidies for a facility that included new and consolidated jobs in Harford County, Maryland. Over time, the deal shrank in dollar value and projected job creation, and the company has barely managed to sustain a headcount required for a forgivable loan. There is no indication that Maryland's generosity was a response to any threats from Battelle that it might leave the state. And the subsidies provided were not specifically intended for high technology firms; they were generic incentives such as property tax abatements and loan assistance available to many kinds of employers.

The Company

The Battelle Memorial Institute is a leading independent research and development organization. Founded in the 1920s and headquartered in Columbus, Ohio, Battelle has an annual budget of about \$4 billion and a workforce of about 20,000. It is organized as a non-profit corporation.

The Story as Reported in the News Media

In September 1999 Battelle announced plans to open a \$40 million operating center near Aberdeen, Maryland that it said would bring as many as 300 scientific and technical jobs to Harford County by 2003. (The county comprises the northeast part of metropolitan Baltimore.) Battelle's new Eastern Regional Technology Operation Center was to be located in the county's Higher Education and Applied Technology (HEAT) Center. Battelle was already active in the area at the Aberdeen Proving Ground, a U.S. Army weapons testing facility that occupies a peninsula in the Chesapeake Bay.¹²³ At a press conference announcing the plan, then-Gov. Parris N. Glendening said: "As we all know, the economy of the future is based on knowledge. A private company like Battelle would not be here, would not be expanding here, except for Aberdeen Proving Ground."¹²⁴

The deal received no more media coverage until June 2001, when Battelle made a new announcement about opening a facility on 30.5 acres of land in the HEAT center. However, the facility was now valued at only half as much as originally announced: \$20 million. The land, to be purchased from the Maryland Transportation Authority for the favorable price of \$2.1 million, was located in an enterprise zone. A Battelle spokesperson said that, in addition to zone tax breaks, the organization expected to receive training and recruitment subsidies.¹²⁵ The Baltimore *Sun* later reported that Battelle would receive grants and loans of \$566,000 and tax credits of about \$250,000 for the facility.¹²⁶

Battelle's 80,000-square-foot Eastern Science and Technology Center officially opened in March 2003 with a staff of about 200 scientists and researchers.¹²⁷

Details from State and County Documents

According to county and state documents we obtained under the state's Public Information Act, discussions between Battelle and Harford County apparently began in early 1999, but they involved a different proposed facility and deal structure. On April 21 of that year, Harford County Executive James M. Harkins wrote to Warren C. Mullins, Battelle's Vice President of Business Development, proposing that Battelle use space in the HEAT Center—a business park owned by the Maryland Transportation Authority (MdTA)—for its planned National Toxicological Laboratory. "We are prepared to broker a more detailed discussion of a build-to-suit development project for Battelle," Harkins wrote, "with the Maryland Economic Development Corporation (MEDCO) acting as the project developer."

J. Thomas Sadowski, the county's Director of Economic Development, followed up with a letter to Mullins on April 28 in which he referred to a previous conversation and proposed subsidy assistance from Harford County, the State of Maryland Department of Business and Economic Development (DBED) and MEDCO. The county agreed to broker negotiations with MdTA for land at the HEAT Center and with MEDCO for the development, construction and leasing of the proposed facility. The offered package included:

- Loan convertible to grant
- Low-interest loan
- Enterprise Zone Tax Credits (including an estimated \$669,803 in real property tax credits in years 1-10 and \$37,5000 in income tax credits in year one)
- Maryland Job Creation Tax Credits worth an estimated \$90,000
- Workforce Development Assistance (possibly including a \$50,000 grant)
- Bond financing for MEDCO's role as developer and construction agent
- Fast track processing of development plans and permits

While these negotiations were taking place, Battelle was not tax-exempt. It had given up that status a quarter-century earlier in a legal dispute over whether it was living up to its philanthropic commitments. In 2002 Battelle regained tax-exempt standing (retroactive to May 2001). This rendered moot the provisions in the Maryland deal relating to state corporate income taxes. Battelle, however, remained subject to local property taxes.

On June 8, Sadowski followed up a meeting with Thomas M. Pounds, Battelle's Vice President for Corporate Strategy and Planning, with a letter accompanied by a project outline. The proposed facility had now become a biomedical lab (with a cost of \$33.6

million), an electronic engineering R&D facility (\$3.3 million) and administrative offices (\$1.1 million) along with \$5.5 million in equipment purchases. These would create 250 new jobs and retain 50 existing ones at an average annual salary of \$55,000.

On July 21, Richard C. Mike Lewin, Secretary of DBED, sent a letter to Battelle's chief executive (who had apparently met with DBED staffers at Battelle's headquarters in Columbus). He wrote that "the State of Maryland and Harford County can provide a business such as yours with phenomenal opportunities as we enter the 21st century." In addition to having MEDCO build the facilities for Battelle, Lewin said the agency would consider providing loans of up to \$5 million and would provide \$300,000 in state training funds. This would be in addition to up to \$450,000 in Maryland Job Creation Tax Credits.

After showing the money on the table, Lewin described the other advantages of the site, including the concentration of federal research in the area and the high education level of Maryland's workforce. Along with the letter, Lewin sent a nine-page document describing the incentives in more detail.

The state files we received do not include any written replies from Battelle to these overtures, but they do include a resolution passed by Battelle's board of trustees on August 10, 2000 authorizing the deal. However, Battelle officials decided to use the HEAT Center land for a Technology Center and to build and own the facility itself rather than having MEDCO act as developer and landlord.

In a November 8, 2000 letter of intent to MdTA to purchase eight parcels of land at the HEAT Center and to spend \$20 million building the Technology Center, Battelle Vice President-Government Business Services Stephen R. Heimann gave 15 conditions. They included a \$900,000 payment from DBED's "Sunny Day Fund" and continuation of existing property tax abatements. In a second letter, Heimann told DBED and the County Executive of Battelle's plan and committed to employing 150 people at the site, adding that "we fully anticipate the creation of a substantial number of jobs in excess of this target."

On March 19, 2001, DBED Secretary David Iannucci and the County's Sadowski responded in a letter to Battelle CEO Douglas Olesen. On the assumption that Battelle would spend \$20 million on the new facility—relocating 89 employees from the company's existing Maryland facility and hiring an additional 166 full-time employees¹²⁸ by the end of 2005—DBED committed to the following: a workforce grant of up to \$166,000 and an eight-year unsecured loan of \$400,000 at 3 percent, the principal and interest on which would be forgiven if the company had at least 225 full-time employees in Harford County by the end of 2005 and retained them through the end of 2008. A partial loan forgiveness would be allowed for employment of at least 200 people.

The letter listed other possible incentives, including state Job Creation Tax Credits worth up to \$249,000; Enterprise Zone Tax Credits (including real property credits worth an estimated \$1.5 million and income tax credits); and various county incentives. Olesen accepted the terms by countersigning the letter on April 20, 2001.

On June 20, the state formally transferred ownership of the HEAT Center parcel to Battelle for \$2.135 million. On October 1, DBED Secretary Iannucci sent a letter to Olesen formally offering the \$400,000 loan. A loan agreement dated February 11, 2002 was signed by the parties, and a check was sent on February 14. The agreement said that the loan was made pursuant to the Maryland Economic Development Assistance Authority and Fund.

On December 19, 2001 Harford County wrote to Olesen offering up to \$40,000 in matching technical training grant funds. In March 2003 Battelle signed an agreement with DBED under which it would receive up to \$91,365 in funds under the Maryland Industrial Training Program. The agreement required Battelle to reach 166 full-time, permanent employees by the end of 2005 and maintain that level for two years.

In January 2004 Battelle applied for \$20 million in industrial development revenue bonds to be issued by Harford County. These so-called “private activity bonds” typically lower the cost of private construction because they are issued by a public agency and therefore the interest paid on them is tax-free to investors. The interest rate savings are very substantial, typically about one fourth lower (e.g., six percent instead of eight percent) compared to taxable commercial bonds. The following month Harford County approved up to \$22 million in such financing; however, according to an Official Statement dated April 2004 we obtained from Munistatements, the actual bond issue was set at \$17.8 million.

Before long, Battelle was planning an expansion of its HEAT Center facility. It arranged to purchase additional land from the Maryland Transportation Authority for \$1.65 million. On April 19, 2006 Harford County and DBED wrote to the new CEO of Battelle, Carl Kohrt, offering a state loan of \$400,000, forgivable if the company’s workforce increased to at least 270 full-timers; a state workforce grant of up to \$240,000; enterprise zone property tax credits; county training assistance; reduced utility rates from BG&E; and other incentives. In June 2006 the state approved the \$400,000 loan.

Battelle has barely sustained the 225-job target in its original deal: in a January 21, 2008 letter to Harford County, it reported 231 jobs at the end of 2007 (down from 272 at the end of 2006, which in turn was down from 383 at the end of 2005).

Conclusion

State and county officials did not have to try very hard to lure Battelle, since the company already had operations in the area, and its initial plan for a toxicological lab fit well with the work already being done by Battelle and others at the nearby Aberdeen facility.

Nonetheless, it appears that the state and the county rushed to offer a subsidy package to Battelle that included property tax exemptions, loan-interest loans, training grants and tax credits. Initially, the state was also offering to serve as the developer and landlord to Battelle. Although public records shed no light on why, Battelle rejected that lease option in favor of building and owning the facility itself, with some financial help from the state.

The records also give no indication that the state was aware that Battelle regained its tax-exempt status in 2002, which mooted some of the tax incentives being offered.

Battelle purchased the land at a low price and also received a training grant and a low-interest loan that was forgivable if the company meets modest job-creation criteria. It also got low-interest industrial revenue bonds through the County. When Battelle decided to expand, it again received land at a favorable price and was offered another package of tax holidays, a loan, and training grants.

Battelle at first surpassed its job-creation goals by a wide margin but subsequently reduced its employment sharply, barely remaining in adherence to the loan agreement.

Finally, the deal for Battelle did not hinge on Maryland's targeted subsidy programs for high-tech industries. The abatements, loans, grants and low-cost financing described above are typically available to a wide range of companies.

New Jersey Case Study: Nycomed (formerly Altana) (Florham Park)

When German drug company Altana announced in 2001 the launch of a new product line in the U.S. market, it chose Florham Park, New Jersey and predicted more than 1,000 jobs within five years.

However, despite that rosy forecast, public records reveal that the New Jersey Economic Development Authority (NJEDA) imposed only the state's minimum requirement—75 jobs—for the company to remain eligible for the most lucrative economic development subsidy, a personal income tax rebate. The project's employment peaked at around 550 and later fell to fewer than 100 jobs.

The company apparently remained in technical compliance with the job requirement, enabling it to keep all of the lucrative rebates derived from its employees' paychecks, including from workers who were later laid off.

The Company

The deal originally involved the U.S. pharmaceutical business of Altana AG, a German specialty chemicals company that in 2008 had revenues of about \$2 billion. In 2007 that business, Altana Pharma, was taken over by Nycomed, a privately held pharmaceutical group with headquarters in Zurich, Switzerland. Nycomed had global revenues of about \$4.8 billion in 2008.

Project Summary from News Media Reports

In September 2001 the German pharmaceutical giant Altana AG announced a new U.S. operation called Altana Pharma to market pulmonary and gastrointestinal medications developed by the parent company.¹²⁹ The company located its marketing and product development operations in Florham Park, New Jersey, which would also be the site of some other company functions. When the operation opened in September 2002 Altana predicted that the payroll would exceed 1,000 within five years, but it never came close to that figure, peaking at about 550 positions.¹³⁰

In October 2006, the company announced that it would shut its sales and marketing operations in Florham Park, eliminating about 350 of those jobs, while the other functions would remain at that location.¹³¹ This occurred shortly after the parent company was sold to the Swiss group Nycomed.

After the announcement of the partial closure, the non-profit watchdog group New Jersey Policy Perspective issued a press release noting that Altana had received grants totaling nearly \$500,000 from the state's Business Employment Incentive Program (BEIP, a payroll tax rebate). The organization called on the company to repay the subsidy, stating that "New Jersey taxpayers shouldn't have to support payoffs for layoffs."¹³² It appears that the state did not immediately try to claw back the funds.

In addition to BEIP payments for the Florham Park site, Altana had also been receiving BEIP payments for a site in Parsippany-Troy Hills. And while workers were laid-off in Florham Park, BEIP dollars continued to flow to Altana based on payroll in Parsippany. That was allowed because the Altana BEIP grants predated 2004 reforms to the BEIP program that made it more accountable by requiring the state to look at a BEIP company's employment statewide when determining if clawbacks will be used.¹³³ As of October 2009, NJEDA records indicate that the only active BEIP site for Nycomed (the successor company) is the former Altana site in Parsippany-Troy Hills and that it has received \$1.2 million in BEIP payments.

Details from State Records

Despite the public announcement of 1,000 projected jobs, Altana's application to the New Jersey Economic Development Authority dated November 13, 2000 included a projection that it would hire only 122 new employees in New Jersey during the first year at an average annual salary of \$97,870. In an agreement signed in 2003 between Altana and the EDA, the company projected that it would create 174 jobs over two years; the state in turn promised a BEIP grant equal to 65 percent of the state personal income taxes withheld by the company from the employees' paychecks. The "minimum eligibility threshold" to sustain the BEIP tax diversion was set at only 75 jobs, the state minimum.

In 2008, after Altana was taken over by Nycomed, the company filed a change-of-name form with the NJEDA. On March 10 the NJEDA responded with a letter saying that it appeared that the company was no longer in compliance with the "minimum eligibility

threshold” and asked for a repayment of about \$348,000 in grant proceeds for 2006. The company responded that it was technically still in compliance since it had 82 employees at the end of the year, after apparently engaging in further downsizing beyond what it had announced in October 2006. The NJEDA apparently accepted the company’s position.

Conclusion: Did a Lucrative Tax Rebate Attract Rootless Jobs?

Given the project’s ultimate failure to grow stable jobs and the company’s narrow compliance with a minimum job requirement, it appears that Altana may have been more interested in New Jersey’s lucrative BEIP rebates of personal income taxes than it was in the state’s labor force, industry linkages, or other business assets.

BEIP grants, while costly, are not a particularly good tool for growing high-tech jobs and are not specifically targeted to them. Because the job creation requirements in BEIP were low (they have since been lowered to 10 for high-tech companies), the company apparently remained technically in compliance—and therefore eligible to keep past tax rebates derived from former employees’ paychecks—even after laying off most of its peak workforce, employing only eight percent as many people as it first projected.

West Virginia Case Study: Kureha (Belle)

West Virginia landed a capital-intensive plant of the Japanese firm Kureha that will make bottling plastic; it is located next to a longstanding DuPont factory that will feed it raw materials. Economic development subsidies were not cited by public officials at the time of the announcement and there were no known competing locations; proximity to the feeder plant appears to have been key, almost an act of chemical engineering historical reverence according to a company statement after construction began.

The surrounding labor market also has many skilled dislocated chemical-plant operators. The project will likely qualify for two as-of-right tax credits, one of which is targeted to high technology. It also received a modest amount of technical assistance and training aid and benefited from the expansion of an existing free trade zone, but none of these latter subsidies is particular to high technology.

The Company

Kureha Corporation is a Japanese company that produces specialty plastics, food packaging, agrochemicals, and pharmaceuticals. It has annual revenues of about \$1 billion.

Project Summary from News Media Reports

In December 2007, Kureha announced it would invest more than \$100 million in a new plant in Belle, West Virginia.¹³⁴ Expected to create about 50 new jobs, it would produce a high-performance polymer, polyglycolic acid (PGA), used for bottling carbonated soft drinks and beer and valued for its greater strength and resulting economy of use. Production at the Kureha plant is projected to begin in 2010.

The announcement was hailed by West Virginia Governor Joe Manchin and U.S. Senator Jay Rockefeller, among others.¹³⁵ The officials had visited the company during two trade missions to Japan, and the company cited the presence of many other Japanese manufacturers in the state as a positive. There were no references to economic development subsidies in the announcement of the plant or the immediate reactions by public officials.

Proximity to a key input appears to be the decisive site location advantage: the Kureha project site is adjacent to a DuPont chemical plant which will supply it raw material. The DuPont operation, where nylon was first produced, had experienced waves of downsizing and layoffs during the past two decades. Interviewed for the Spring 2008 groundbreaking, Kureha CEO Takao Iwasaki said of the location: “There is also a sentimental reason. Belle is the birthplace of nylon. This is almost holy ground for chemical engineers. And we are chemical engineers.”¹³⁶

In early 2008 the Charleston Area Alliance announced that it was providing free space in its business incubator for an eight-member design and engineering team from Kureha working on the new plant. Elizabeth Gershon, executive vice president of Kureha America Inc., told a reporter: “We are gratified by the enthusiastic reception we have received by government officials, business leaders and economic development organizations, including the Charleston Area Alliance.”¹³⁷

Sen. Rockefeller was among the public officials who attended the official groundbreaking for the site in April 2008; he issued a press release noting that he and Gov. Manchin were part of a trade mission that had visited Kureha’s Japanese headquarters in 2005. An April 8, 2008 article in the *Charleston Gazette* reported that the recruitment efforts dated back to a 2003 state-led trade mission.¹³⁸

In July 2008 the West Virginia Economic Development Authority endorsed a revision of the boundaries of an existing foreign trade zone at DuPont’s Belle plant to include the new Kureha facility, allowing it to import materials and then export finished products free of tariffs.

It was not until April 2009 that construction actually began at the Kureha site, but operations are expected to begin in mid-2010, with a staff of 50, including 10 Japanese and 40 American.

Details from Public Records

In the only such response Good Jobs First has ever received from a state government, the West Virginia Development Office cited state code in claiming that correspondence and other records relating to the negotiation of business assistance are exempt from public disclosure. However, Steve Spence of the agency orally informed us that Kureha was going to receive:

- Governor's Guaranteed Workforce Training Funds worth \$2,000 per job
- Economic Opportunity Tax Credits worth 20 percent of the value of the investment spread over 10 years. (If the company invested \$100 million, that would create a tax credit entitlement of \$20 million, or \$2 million a year for 10 years.) Spence stated that the company would probably be unable to use the full value of the credits because its tax liability would not reach that level.

The Charleston Area Alliance confirmed to us that it provided free office space for Kureha. It also provided technical assistance, including help orienting Kureha's Japanese employees to the area and facilitating a series of meetings between the company and the West Virginia State Community and Technical College to discuss the school's program for chemical operators.

Conclusion

West Virginia scored a rare high-tech investment when this Japanese company decided to open a specialty plastics operation. It appears that proximity to a raw materials source was key to the siting decision and that subsidies did not play a role.

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.¹³⁹ Many of Pennsylvania's Industry Partnerships are in high-technology, including the biomedical industry, information technology, plastics, powdered metals, and energy.¹⁴⁰

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.¹⁴¹

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.¹⁴² 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.¹⁴³

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.

Notes

- ¹ Alan Peters and Peter Fisher. *State enterprise zone programs: Have they worked?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2002.
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- ⁶ Council on State Taxation, Total state and local business taxes: 50 state estimates for fiscal year 2008. Washington, D.C.: January 2009.
- ⁷ Neumark, Zhang & Wall, "Are businesses fleeing the state? Interstate business relocation and employment change in California", *California Economic Policy*, Vol. 1, No. 4, Oct. 2005, Public Policy Institute of California. There are some limits to what NETS can tell us about employment change. For example, if a company with a Pennsylvania presence sets up a branch in another state, it does not show up in the Pennsylvania data base, but then such an event may not occur at the expense of jobs in Pennsylvania. Nor does NETS capture companies that have moved their entire operations out of the country, although the federal Trade Adjustment Assistance data likely captures that. Finally, if a company is purchased and the parent moves the establishment out of state and the old company is completely subsumed (giving up its DUNS number as opposed to becoming a "division"), it is recorded as a "death."
- ⁸ Source: NETS; based on Good Jobs First list of high tech SICs (see Appendix C4). The total number of high-tech establishments in the NETS Pennsylvania database was almost 140,000 from 1990 – 2006.
- ⁹ Estimate from the 2002 Economic Census.
- ¹⁰ For example, a longtime executive with one of the nation's largest business location specialists (Deloitte & Touche/Fantus) reviewed five years of company files to determine the relative importance of each cost factor for their client's location decisions. He found that taxes were a "low priority and [had] minimum cost impact" (Ady, *New England Economic Review*, March/April 1997, p.79). And after a review of the literature on the impact of state taxes on economic development, a respected economist found that "taxes do not appear to have a substantial effect on economic activity among states." (Wasylenko, *New England Economic Review*, March/April 1997, p.47).

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- ¹³ Our research methodology progressed in four stages. Since Pennsylvania announced its success in luring companies across state in DCED press releases, we looked to see if other states did the same. First, we searched states' economic development agency press releases via their websites, using key words found in interstate job relocations. Terms that were searched as likely to be correlated with job relocation deals included: "relocate/relocation", "from [various states]", "-based", "create", "new", "jobs", "grant", "subsidy", "move/moving", "competitive", "business", and "climate." Second, we searched Nexis' State News Wire and Governor websites for press releases with similar terms. Third, we checked Pennsylvania specific venture capital firm annual reports for relocation language. Finally, once data were collected from every state, we tallied the cases to evaluate whether any state stood out. This evaluation included checking companies against R & D tax credit claims (to determine if they were high-tech firm).
- ¹⁴ North Carolina encouraged Loparex, a manufacturer, to relocate from Illinois by awarding \$2.78 million (\$21,699 per job).
- ¹⁵ Maryland awarded \$600,000 to Cinetic Landis Grinding Corporation to relocate from Pennsylvania (\$3,967 per job).
- ¹⁶ We note that former DCED secretary Dennis Yablonsky was hired after running the Life Sciences Greenhouse in Pittsburgh. These claims are detailed in the Central Pennsylvania and Pittsburgh Life Science Greenhouses and BioAdvance the Biotechnology Greenhouse of South-eastern Pennsylvania 2007-2008 annual reports.
- ¹⁷ AE Polysilicon is typically ambiguous among these press announcements. The green technology company received an \$8.2 million Pennsylvania subsidy to create 145 jobs, or \$56,552 per job. Gov. Rendell's press release says explicitly, "relocating from New Jersey, the company will house its global headquarters in its new 16,000-square-foot facility... an \$8.2 million Governor's Action Team funding package." Checking the company's website to see whether it also relocated R&D or manufacturing (it claims R&D job creation but the company does not draw Pennsylvania R&D tax credits) reveals that the company still maintains a location in New Jersey and currently has three sites in Pennsylvania, one housed in the Ben Franklin Tech Ventures Research Lab. The seven other companies included pharmaceutical, manufacturing, corporate headquarters, distribution warehouses, telemarketing, and information technology. None appears on Pennsylvania's R&D tax credits lists between 2005 and 2009.
- ¹⁸ 2007 wage data from BLS. The figures are statewide and, therefore, do not capture variations by county or by the size of the firm. Wages for several industries are averages of two or three NAICS categories
- 2835: NAICS 325412 and 325413
- 3577: NAICS 334118 and 334119
- 3829: NAICS 334514, 334518, and 334519

3841: NAICS 339111 and 339112

3842: NAICS 334510 and 339113

3851: NAICS 339113 and 339115

4812: NAICS 517211 and 517212

4899: NAICS 517212 and 517410

7372: NAICS 334611 and 511210

7379: NAICS 541512 and 541519

The industries without wage data (“NA”) were “Not Disclosable — data do not meet BLS or State agency disclosure standards”.

- ¹⁹ On this, see http://www.paworkforce.state.pa.us/about/lib/about/pdf/industry_partnership_booklet_final.pdf.
- ²⁰ Ann Markusen, “Targeting occupations in regional and community economic development,” *Journal of the American Planning Association*, Summer 2004, Volume 70, Number 3, pp. 253-268.
- ²¹ According to Kevin Hollenbeck, investment in skills—in the form of customized job training—is 17 times more cost-effective in creating jobs than business tax incentives. See Kevin Hollenbeck, “Is there a role for public support of incumbent worker on-the-job training?” Upjohn Institute Staff Working Paper No. 08-138, available at www.upjohninstitute.org/publications/wp/08-138.pdf,
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- ²³ Stephen Herzenberg, *Invest in good jobs through economic development for the 21st century*, background paper for the Prescription for Prosperity, (Harrisburg: Keystone Research Center, March 2007), Box 3, pp. 5-6.
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- ²⁵ The data presented on location quotients is derived from public use data from the American Community Survey (ACS), a three-year pool of data collected in 2005, 2006 and 2007, and the 2000 Decennial Census made available by Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander, “Integrated Public Use Microdata Series: Version 4.0” [Machine-readable database] (Minneapolis, MN: Minnesota Population Center [producer and distributor], 2009). Data from and documentation for this source are available online at <http://usa.ipums.org/usa/>. For the years 2005-2007, we report ACS data only for occupations in which the sample size for the metro area is at least 30.

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- ²⁸ Carey Durkin Treado, *Sustaining Pittsburgh's steel technology cluster*, Center for Industry Studies, University of Pittsburgh, September 2008, online at <http://www.industrystudies.pitt.edu/papers/Sustaining%20Pittsburgh%27s%20Steel%20Technology%20Cluster%20sept08.pdf>
- ²⁹ Computer and Mathematical occupations as a group include: Computer Scientists and Systems Analysts, Computer Programmers, Computer Software Engineers, Computer Support Specialists, Database Administrators, Network and Computer Systems Administrators, Network Systems and Data Communications Analysts, Actuaries, Operations Research Analysts, Miscellaneous mathematical science occupations (including mathematicians and statisticians).
- ³⁰ Health Care Practitioners and Technical Occupations as a group include: Chiropractors, Dentists, Dietitians and Nutritionists, Optometrists, Pharmacists, Physicians and Surgeons, Physician Assistants, Podiatrists, Registered Nurses, Audiologists, Occupational Therapists, Physical Therapists, Radiation Therapists, Recreational Therapists, Respiratory Therapists, Speech Language Pathologists, Therapists All Other, Veterinarians, Health Diagnosing and Treating Practitioners All Other, Clinical Laboratory Technologists and Technicians, Dental Hygienists, Diagnostic Related Technologists and Technicians, Emergency Medical Technicians and Paramedics, Health Diagnosing and Treating Practitioner Support Technicians, Licensed Practical and Licensed Vocational Nurses, Medical Records and Health Information Technicians, Opticians, Miscellaneous Health Technologists and Technicians, Other Healthcare Practitioners and Technical Occupations.
- ³¹ The firms in this sub-cluster use and develop technologies to enhance human health such as research laboratories, medical imaging centers as well as include manufacturers of pharmaceutical, surgical and medical equipment.
- ³² Biomedical occupations as a group include: Physicians and Surgeons, Diagnostic Related Technologists and Technicians, Biomedical and agricultural engineers, Miscellaneous life, physical, and social science technicians (including social science research assistants and nuclear technicians), Medical Scientists, Chemists and Materials Scientists, Biological Technicians, Clinical Laboratory Technologists and Technicians, Health Diagnosing and Treating Practitioner Support Technicians, Medical, Dental, and Ophthalmic Laboratory Technicians. The biomedical sub-cluster is defined by the Pennsylvania Department of Labor and Industry in its report *Workforce Choices: Biomedical* available online at http://www.paworkforce.state.pa.us/professionals/lib/professionals/workforce_choices/wfc_bmed.pdf.
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Good Jobs First
1616 P Street NW, #210
Washington, DC 20036
Phone: 202-232-1616
www.goodjobsfirst.org

