

New England Journal of Public Policy

Volume 9 | Issue 1

Article 5

6-21-1993

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Tilly, Chris (1993) "State Strategy for Developing Base Industries: A Massachusetts Case Study," *New England Journal of Public Policy*: Vol. 9: Iss. 1, Article 5.

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State Strategy for Developing Base Industries

A Massachusetts Case Study

Chris Tilly

In developing strategies for economic development, state governments must target base industries that bring income into the state and drive the rest of the economy. This article presents a case study of industry analysis and development strategy for Massachusetts, focusing on the state's base industries. Particular attention is paid to the role of industry clusters — groups of industries linked through customer, supplier, or other relationships, and typically concentrated geographically as well. After assessing strengths and weaknesses of the state's economy, the author concludes that despite the current severe recession, the state possesses the basis for renewed growth. Policy implications for the state government are summarized.

To develop a strategy for economic development, a state government must identify — and find ways to facilitate the growth and prosperity of — key industries. In particular, states must target base industries that bring income into the state and drive the rest of the economy. This article presents a case study of industry analysis and development strategy for Massachusetts, focusing on the state's base industries. The discussion draws on the insights of over thirty economic development experts from business, government, and the academy who participated in a 1992 Massachusetts conference.¹

In the first section I lay out a conceptual framework for understanding the role of base industries in the Massachusetts economy. The next section briefly addresses the Massachusetts boom and bust of the 1980s, with particular attention to base industries. The third section assesses current strengths and problems of the Massachusetts economy, focusing on its ability to create good jobs. In the following section I examine the actual and potential base industries for the decade to come. The final section presents goals for an economic development strategy, guidelines for the role of state government in that strategy, and a set of policy proposals generated at the conference.

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What Are Base Industries and Why Do They Matter?

Massachusetts, a small economic unit, is highly connected with the rest of the world economy. As a result, the state imports many products from other parts of the country and from the whole world, be they fruit from Florida, movies from California, or automobiles from Michigan and Japan. The state's ability to import, and thus its overall standard of living, depends crucially on the industries that attract flows of income to Massachusetts, commonly known as base, export, or traded industries. These are businesses — from furniture manufacturers to software designers to insurance companies to universities to tourist attractions — that sell a substantial portion of their goods and services outside the state. The base industries drive the rest of the economy. The number of jobs in local or nonbase entities, such as retail outlets, construction, and even government, ultimately depends on the amount of income brought into the state by the base industries. Economists say that any increase in base industry sales outside the state has a multiplier effect. A Massachusetts knitwear manufacturer that exports the major portion of its goods to other states boosts its payroll. The new employees spend their paychecks at local stores, laundries, and so on. The manufacturer also purchases some raw materials, machinery, and energy from in-state businesses. All these, in turn, may add employees or extend employee hours, use more delivery services, and so on — and the multiplier continues down the line. The total effect is that one new job created in a base industry results, on the average, in 0.5 to 1.5 additional jobs being created elsewhere in the state economy.²

Over the long run, the base industries provide a regional economy's engine of growth. For example, the fortunes of western Pennsylvania rose and fell with the steel industry. In the history of Massachusetts, sea trade, textiles, shoes, machinery, and computers have played similarly decisive roles. But as this list illustrates, base industries can change over time, and different industries may affect different regions within a state.

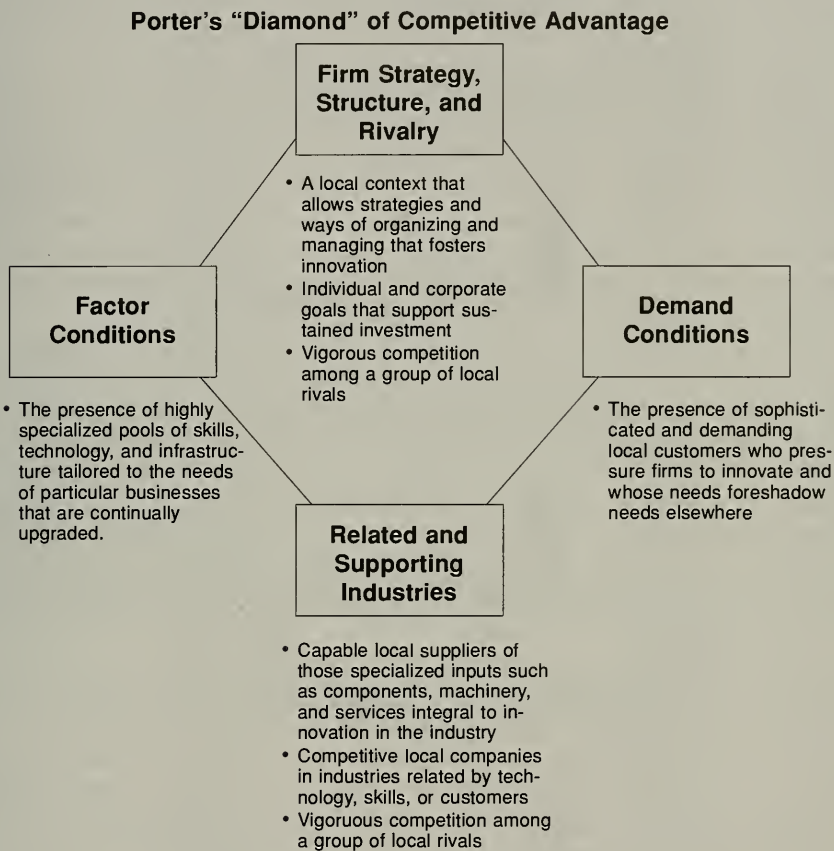
While theoretically defining base industries is simple, actually identifying and measuring them is not. Most industries sell to a mix of in-state and out-of-state customers. Furthermore, government-gathered statistics do not break down figures for in-state and out-of-state sales. While some analysts have expediently defined the base as manufacturing, it is clear that such service industries as hotels and business consulting firms may have substantial out-of-state sales, whereas manufacturing industries, like cement, may not.³ Economic development analysts have developed a variety of techniques to deal with these problems. One approach is to determine which industries are disproportionately concentrated in a state: for instance, since Connecticut insurance carriers employ three times as many people per capita as carriers in the country as a whole, we conclude that Connecticut is exporting insurance to the rest of the country.

Identifying base industries pinpoints a state's current competitive advantage, but it does not tell us the sources of that advantage or the potential for future competitive advantage. To address these issues, Michael Porter has extended the concept of base industries to what he calls industry clusters — groups of industries linked through customer, supplier, or other relationships and, typically, concentrated geographically as well.⁴ For example, Porter identifies one such Massachusetts entity as the information technology cluster, encompassing computer and peripheral manufacturing, software development, information technology professional services, information

retrieval services, telecommunications, precision instrument manufacturing, and electronic components manufacturing.

Porter argues that the cluster as a whole, rather than any one industry within it, generates innovation and competitiveness. Successful clusters — and economically successful regions and nations as well — are characterized by the “competitive diamond” (see Figure 1). Competing companies, sophisticated groups of customers, specialized suppliers, and specialized factors of production (skilled workers, research and development, and infrastructure) form a mutually reinforcing complex.

Figure 1



Source: Michael Porter and the Monitor Company, Inc., *The Competitive Advantage of Massachusetts* (Cambridge, Mass.: Monitor Company, 1991), 10.

Some of the scholars who criticize Porter’s framework argue that Porter overemphasizes rivalry among firms in a cluster, overlooking the cooperation and community that characterize successful industry groupings.⁵ Furthermore, while clusters play a decisive role in a region’s economy, noncluster industries are also essential. Nonetheless, the concept of clusters, as well as the concept of base industries, is useful in thinking about the economic strengths of Massachusetts and other states.

In summary, base industries, particularly those which are part of industry clusters, fundamentally determine the state's economic health. An effective economic development strategy must find ways to aid and stimulate growth and innovation in these key industries. Before moving to the possible effects of policies in the future, we must examine past Massachusetts base industries.

Massachusetts Base Industries in the 1980s

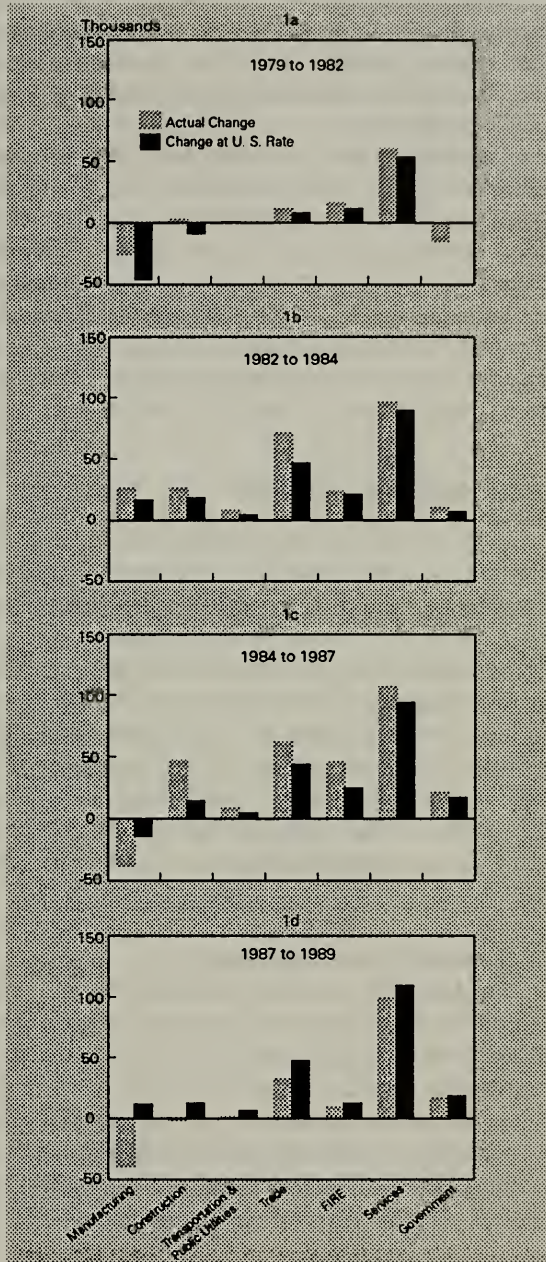
Economist Lynn Browne comments that, as of 1988, "it would have been a brave forecaster indeed who suggested the region was about to suffer a serious downturn."⁶ Nonetheless, the Massachusetts — and New England — slump began in 1989. Looking at the industry patterns that drove the 1980s boom and precipitated the bust helps us think about the potential for future growth.

Figure 2 (reproduced from Browne's article) depicts the change in employment in New England industries at each year of the 1980s, and how the growth (or decline) differed from the U.S. average. Although these figures represent New England trends, they mirror the changes in Massachusetts. The broad pictures are straightforward. In 1979–1982, while the country struggled through the last recession, Massachusetts and New England enjoyed proportionally greater job growth (or smaller losses) in every major industry group except government. By 1987–1989, New England's employment growth lagged behind the nation's in every major industry.

More revealing than the overall trends, however, are the patterns for particular industries. Massachusetts and New England manufacturing employment outpaced the nation's from 1979 to 1984. As it turned out, however, 1984 was the peak. Since that year, the Bay State's manufacturing employment has fallen in absolute numbers and relative to the nation's. From 1984 to 1992, Massachusetts manufacturing jobs tumbled by 30 percent, with almost half the decline taking place before the regional recession began in 1989.⁷ The decline affected durable and nondurable production alike. Particularly visible was the drop in high-tech manufacturing employment. Companies such as Digital, Prime, Wang, and Data General, which had helped propel the boom in the early 1980s, shed jobs after 1984.

Since manufacturing — particularly high-tech manufacturing — is generally viewed as the key base industry in Massachusetts, this represents a puzzle. How did the Massachusetts economy keep expanding between 1984 and 1989 if the driving industry of the region was shrinking? Part of the answer lies in nonmanufacturing base industries. As Browne points out, Massachusetts firms selling to national markets include those in business consulting (such as the Boston Consulting Group), software (such as Lotus), mutual funds (such as Fidelity), and insurance (such as John Hancock) — representative companies in the service or finance/insurance/real estate (FIRE) industries. Services and FIRE continued strong growth in Massachusetts and New England until about 1988 before slowing down, which resulted from a series of factors, including the stock market crash of 1987, the implementation of the Tax Reform Act of 1986, which eliminated some real estate-related tax shelters, and instability among thrifts and commercial banks.

Continuing strength in business services and finance partially accounts for the continuation of the Massachusetts boom despite drooping manufacturing employment. But in addition, Massachusetts "broke the rules" with a real estate boom that was —



at least temporarily — self-sustaining. Buoyed by predictions of manufacturing recovery as well as by bustling service and finance industries, developers undertook a residential and commercial building boom in the late 1980s. Massachusetts and New England employment in construction zoomed past the nation's until 1988. The construction boom itself drove down unemployment and fed prosperity. In addition, the hot real estate market boosted homeowners' wealth, spurring consumption, which also contributed to economic growth. But without strength at the base, this cycle could not continue. The real estate market became saturated — indeed, overbuilt — and real estate values plummeted.

Thus, the Massachusetts boom of the 1980s was somewhat peculiar, having been propelled by manufacturing growth only during the first few years of the decade. After 1984, the boom was fueled by a combination of export services and a temporary surge in local construction and real estate activity. When the crash came in 1989, it hit triply hard: demand for Massachusetts manufactured goods declined, sales of the state's traded business and financial services dropped, and construction and real estate slumped. We cannot expect a replay of this boom in the 1990s, but by assessing the long-term strengths and weaknesses of the Massachusetts economy, we can begin to form a realistic picture of what is possible.

The State of the Massachusetts Economy

Massachusetts brings both problems and strengths into the 1990s. Rather than considering every possible economic strength or weakness, I focus here on those affecting base industries. Much of this section draws on analyses by Sara Johnson and Michael Porter.⁸

Perhaps it is inevitable in a time of recession that Massachusetts's list of problems is longer than its list of strengths. However, the considerable strengths of the state's economy have brought renewed growth repeatedly from the 1950s to the present.

Seven main problems affect Massachusetts base industries: (1) the erosion of base manufacturing; (2) the state's historic dependence on defense; (3) tight credit; (4) poor business climate; (5) high cost of doing business; (6) shortage of industrial space; and (7) dependence of particular regions on a single industry. Let's consider these one by one.

Problem 1: The Erosion of Base Manufacturing

The 30 percent loss of Massachusetts manufacturing jobs is a serious setback. Much of it is temporary, and much of it reflects the national downturn, but part of it reflects competitive weaknesses of specific Massachusetts industries. The best-known example is the minicomputer industry, whose market narrowed through the 1980s as desktop PCs and later network workstations took the place of minicomputers in many workplaces. Over the long run, however, job losses have been concentrated in traditional manufacturing sectors such as fabricated metals and textiles, apparel, and leather.

Problem 2: Dependence on Defense

The end of the Cold War is bringing cuts in every sector of federal defense spending, with real spending cuts over the next five years ranging from 20 percent for research

and development to 40 percent for missiles and ships.⁹ These reductions will hurt those Massachusetts businesses which earlier benefited from the defense buildup. With only 3 percent of total U.S. employment, Massachusetts receives 9 percent of Department of Defense prime contracts.

In manufacturing, sectors affected by spending reductions will include makers of aircraft engines, missiles, guidance systems, communication equipment, instruments, and electronic equipment — and the subcontractors that supply them. The cuts will also strike beyond manufacturing, hitting universities and laboratories conducting defense-funded research as well as military bases and facilities such as Fort Devens. Overall, Massachusetts is losing about 1,000 defense-related jobs per month, and the state stands to lose a total of 50,000 in the next two to three years.¹⁰

Problem 3: Tight Credit

Businesses in Massachusetts complain bitterly of an ongoing credit crunch. As of late 1990, Massachusetts banks ranked last in the country in domestic deposit growth and forty-seventh in domestic loan growth.¹¹ While part of the drying up of credit is a temporary reaction to hard times (and harsh regulatory scrutiny), participants pointed out that the consolidation of the banking industry has virtually eliminated the community banker, shifting decisions over commercial lending to central locations where officials have little understanding or sympathy for local business needs. Most difficult of all is accessing venture capital, especially for small companies.

Problem 4: Poor Business Climate

Many business spokespersons fault the Massachusetts business climate. Compared to that of other states, the permitting process for siting is slow. Businesses must navigate a plethora of state and local regulatory agencies, and communication from these agencies is often unclear or inconsistent. Business owners feel that agency representatives are often indifferent or hostile to business needs and requests.

Problem 5: High Cost of Doing Business

Many Massachusetts business costs remain higher than elsewhere in the country. Average manufacturing wages in the state, which stood 5 percent below the national average in 1980, climbed rapidly during the tight labor market of the 1980s and currently exceed the national average by 17 percent. Part of this wage gap results from the mix of manufacturing jobs in Massachusetts, which is different from that of the nation as a whole, but even after adjusting for the mix, Massachusetts wages are 14 percent higher. Service wages exceed the national average by 11 percent.¹² Slow expected population growth in Massachusetts may create new labor shortages once the economy recovers.

Industrial electricity prices in the Bay State are 13 percent above the national average as well, reflecting high-cost nuclear, oil, and gas generation (though this gap will narrow as Clean Air Act regulations raise the price of coal generation).¹³ Compounding these problems, employer taxes to fund the state's unemployment insurance pool rose substantially in 1992.

Problem 6: Shortage of Industrial Space

Despite the softening of the real estate market, industrial space remains relatively costly and difficult to find in many parts of Massachusetts.

Problem 7: Dependence on a Single Industry

While the state as a whole is relatively diversified, certain regions depend decisively on one industry — or a small number of related industries — rendering them vulnerable to a slump in those industries. For example, Cape Cod and the neighboring islands depend greatly on tourism; southeastern Massachusetts leans heavily on the declining garment and textile industries.

These problems may seem daunting, but the state also possesses three key strengths that offer hope for the future of Massachusetts base industries: (1) an educated work force; (2) research and technology resources; and (3) clusters of competitive industry.

Strength 1: An Educated Work Force

The combination of a concentration of colleges and universities and the growth of industries requiring an educated work force has allowed Massachusetts to generate and retain a highly educated labor pool. The Bay State, which is tied with Connecticut for the highest percentage of college graduates in the adult population, has the highest percentage among twenty-four- to thirty-four-year-olds.¹⁴ The Massachusetts advantage persists as one looks higher up the education ladder as well. Of software CEOs surveyed by the Massachusetts Software Council, 55 percent received their higher education in Massachusetts.¹⁵ Skills and education pay off: between 1979 and 1986, Massachusetts worker productivity rose three times as fast as the national average.¹⁶

Strength 2: Research and Technology Resources

Massachusetts ranks among the top five states in per capita number of scientists and engineers with Ph.D.'s, patents issued, R & D expenditures, venture capital, and science and engineering graduate students.¹⁷ The state's agglomeration of universities, existing high-technology businesses, laboratories, research hospitals, and venture capital firms has proved to be a potent generator of new industries and new products.

Strength 3: Clusters of Competitive Industry

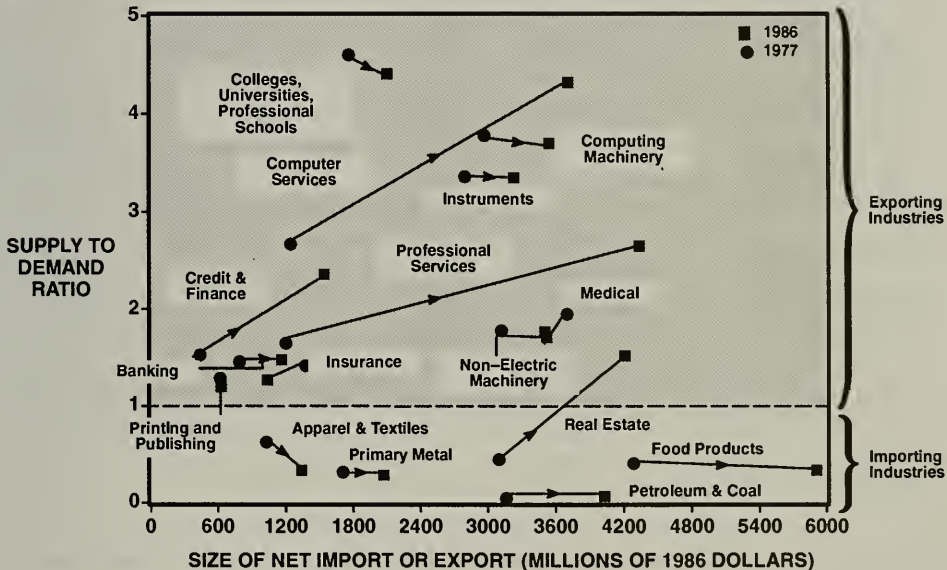
Although Massachusetts is currently in a downturn, and much attention has focused on the rocky fortunes of a few minicomputer manufacturers, many sectors remain vital and nationally and internationally competitive. These sectors have either continued to grow through the slump (for example, in software, in which employment grew 3 percent between 1988 and 1991)¹⁸ or are poised to grow once the national economy recovers. According to Porter, "The core industry clusters in our economy would be the envy of most nations. All are expected to be among the fastest growing sectors of the national and world economy."¹⁹

This inventory of problems and strengths sets the stage for a strategy for development of base industries in Massachusetts. The next step is to identify the base industries that can foster prosperity.

The Future: Massachusetts Base Industries in the Nineties

Which industries will power the Massachusetts economy of the 1990s? Predictably, each expert's list is slightly different. Yet most analysts agree on certain common threads.

Porter identifies four core clusters in the state: health care, knowledge creation, information technology, and financial services.²⁰ They fit his criteria for size and growth over the last two decades, as well as his assessment of their sophistication, productivity, and market position. These clusters embrace the main export industries of Massachusetts, as shown in Figure 3. Heinz Muehlmann, chief economist of the Department of Employment and Training (DET), has tabulated employment for these clusters, along with other industries, for the fourth quarter of 1991 (see Table 1).



The health care cluster includes hospitals, home health care agencies, nursing and personal care facilities, biomedical technology, medical research institutes, medical instrument manufacturing, and medical laboratories. As Table 1 shows, this cluster, which employs more than 300,000 people, represents 13 percent of Massachusetts private employment. By far the largest sector within this cluster is hospitals, with 132,000 employees; biotechnology and medical instrumentation, by contrast, account for a far smaller 30,000.

Table 1

**Massachusetts Private Sector Employment by Clusters,
Fourth Quarter 1991**

Major Clusters	Employment	As percentage of total
Health care	311,224	13.0%
Knowledge creation	179,163	7.5%
Information technology	154,615	6.5%
Financial services	141,198	5.9%
Travel and tourism ^a	87,500	3.6%
Total	873,700	36.5%
Minor Clusters (Traditional Manufacturing)		
Metals	48,086	2.0%
Machinery	52,626	2.2%
Plastics	21,953	0.9%
Apparel and textiles	32,239	1.3%
Paper	21,072	0.9%
Printing & publishing	48,640	2.0%
Food products	19,579	0.8%
Aerospace/missiles	25,057	1.0%
Chemicals	13,712	0.6%
Instruments	50,529	2.1%
Other manufacturing	36,476	1.5%
Total	369,960	15.5%
Total, All Clusters	1,243,660	52.0%
Local (Noncluster) Industries	1,148,295	48.0%
Total Employment	2,391,955	100.0%
Special Clusters ^b		
Defense-related	158,313	
Environmental	55,000	
Marine-related	81,826	

Source: Heinz Muehlmann, "Employment Profile of the Massachusetts Economy, 1988-1991," Massachusetts Department of Employment and Training, July 1992, 2.

^aEmployment estimated by industry representatives.

^bEmployment estimated by industry representatives; overlaps with categories above.

The knowledge creation cluster includes research and development laboratories, educational institutions, basic research institutions, think tanks, engineering firms, consulting firms, legal firms, printing and publishing companies, and advertising market research firms. Almost 180,000 people, close to 8 percent of the commonwealth's private work force, are employed in this sector. Colleges and universities make up the largest subgroup, with 72,000 employees.

The information technology cluster includes computer and peripheral manufacturing, software development, information technology professional services, information retrieval services, telecommunications, precision instrument manufacturing, and electronic component manufacturing. Unlike the other clusters, no one sector dominates this cluster's work force of 155,000 — almost 7 percent of total private employment: computer and office equipment manufacturers account for 39,000,

electronic components for 30,000, and computer services, chiefly software, for 40,000.

The financial service cluster includes banking, venture capital, asset management, life and property/casualty insurance, and real estate. Financial service weighs in with 141,000 employees, 6 percent of the state's private work force. The major employers within this cluster are depository institutions (76,000) and insurance carriers (53,000).

Muehlmann also identifies a travel and tourism cluster, with 87,500 employees. It is not clear that this is a cluster in Porter's sense of a dynamic, innovative group of industries, but it clearly is an important employer in Massachusetts.

Moving beyond the core clusters, Porter suggests three minor clusters. One, the new, growing environment equipment and service industry, includes engineering firms, manufacturers of equipment used in environmental monitoring and recycling processes, hazardous waste management firms, and consulting firms working with issues like asbestos removal, among others. The Environmental Business Council claims 55,000 employees in this industry. (Government statistics are not conducive to measuring this number, so Table 1 shows it separately, along with defense and marine industry clusters.) Many of these businesses apply high technology to environmental problems, making up what is called the envirotech industry.

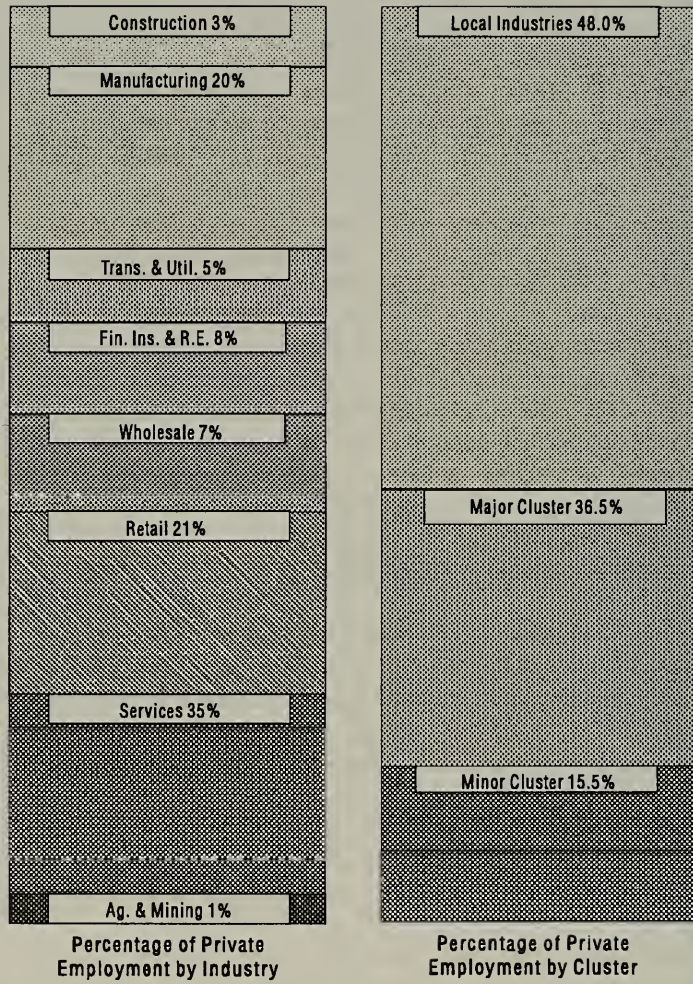
Porter's other two minor clusters, although they are more mature, traditional manufacturing industries, still possess the capacity to innovate and penetrate niche markets. Metalworking, centered in central and western Massachusetts, accounts for 101,000 workers when primary metals, fabricated metals, and machinery (except electrical) are included. Plastics, concentrated in the Leominster-Fitchburg area, employs 22,000.

The DET breakdown identifies eight additional Massachusetts manufacturing industries as minor clusters. Although these may be small in terms of statewide employment, they play a crucial role in providing jobs in particular substate regions. Looking through this local area lens, we can certainly suggest a number of other miniclusters, for example, fishing and marine industries, furniture, paper, and food processing, but it will require further research to come up with a full set of new cluster definitions.

Overall, then, major clusters account for 36.5 percent of the state's private work force, minor clusters for 15.5 percent, and local industries for 48 percent (see Figure 4).

How well positioned are the Massachusetts industry clusters? Overall, Massachusetts private employment dipped 11.8 percent between fourth quarter 1988 and 1991. The major clusters lost only 3.9 percent of their jobs, and major plus minor clusters lost only 7.9 percent. However, these averages conceal substantial variation. For example, among the major clusters, information technology lost jobs faster than overall private employment (-16%); financial services and travel/tourism lost jobs at almost the statewide rate (-9.6% and -8.5%, respectively); knowledge creation remained essentially unchanged (-0.1%); and health care actually gained jobs at a 9 percent clip.²¹

Despite the recent losses in many of these industries, analysts, including Porter and Johnson, view the major clusters — and selected minor ones — as healthy and competitive. Porter cautions that in some cases industry growth will be limited by



constraints on demand, such as cost-containment pressure in health care and the shrinking college population — and rising cost of higher education — in knowledge creation. Table 2 shows the list of potential growth industries offered by Johnson and three other experts — John Hodgman, president of the Massachusetts Technology Development Corporation, and Chris Sands and David Basile, senior vice president and vice president, respectively, of Tucker Anthony.

Table 2

Potential Growth Sectors Identified by Experts

Sara Johnson, DRI/McGraw-Hill

- Information systems
 - Networking equipment
 - Parallel-processing supercomputers
- Fault-tolerant computers
- Video communications
- Health care
 - Biotechnology, biopharmaceuticals

John Hodgman, Massachusetts Technology Development Corporation

- Computer networking and communications
- Fiber optics
- Software
- Supercomputing
- Biotechnology
- Manufacturing equipment
 - (e.g., for the semiconductor industry)
- Contract manufacturing
- Educational materials and services

Chris Sands and David Basile, Tucker Anthony

- Health care
- Envirotech
- Telecommunications
- Biotechnology

Source: Presentations at conference cosponsored by the Massachusetts Executive Office of Economic Affairs and the University of Massachusetts, "Expanding the Base of Our Economy to Provide Good Jobs," University of Massachusetts at Lowell, July 16, 1992.

Certain commonalities appear in these lists, as well as in Porter's views. All agree that several overlapping factors will characterize the industries and companies which will come out on top in Massachusetts

- New or specialized products
- High-value-added products
- Focus on quality and meeting customer needs
- Products building on high technology
- Goods and services requiring high skill levels

These industries will benefit most from the state's skilled work force and its strengths in technology and research. They are industries for which — unlike the traditional manufacturing industries — high labor costs are an expected part of doing business and a spur to increases in innovation and productivity.

Of course, none of this implies that traditional manufacturing jobs will disappear or become unimportant in the Massachusetts economy. The hundreds of thousands of jobs provided by traditional manufacturing will continue to be a mainstay for the Bay State. But within these industries as well, new growth will be spawned largely by

companies that are innovating or aiming at niche markets. Examples of such companies abound. Within the declining Adams-Gardner area furniture sector, companies such as a ceramic tabletop manufacturer are developing high-value-added products and conquering international markets. Despite the overall stagnation of the needle trades, a Polo apparel factory in Lawrence is using advanced process technology, with high-value-added results. These exceptions help to prove the general rule.

Goals, Guidelines, and Policy Proposals

The following initial recommendations for state policies to facilitate the growth of base industries and the creation of good jobs are based on this analysis of the strengths and weaknesses of the Massachusetts economy. They fall into three categories: goals for economic development policy, general guidelines for policy, and policy proposals.

Goals for Economic Development Policy

It is useful to specify general economic development goals and the criteria for identifying the industries we wish to foster.

General economic development goals should include

- Creating a high standard of living in the state
- Inclusiveness — avoid leaving any particular regions of populations behind
- Sustainability

Desirable industry characteristics dovetail with the attributes of growth sectors.

- Ability to apply new technology
- High-value-added products
- High-wage jobs
- Ability to generate multiple products from a single technology
- Utilization of local resources
- Minimum seed money, maximum leverage
- Growth potential
- Exporting to other regions

General Guidelines for Policy

Several major guidelines characterize a wise state economic development policy for Massachusetts.

- Economic development policy must be flexible and multifaceted. In addition to its emphasis on base industries, the state must pay attention to other industries. Base and nonbase industries are interdependent, as the clusters demonstrate. In addition to targeting growing industries, Massachusetts must retain existing industries.
- Economic development policy must serve everyone in the state. This involves separate strategies for each region of the state and an end to a state government perspective on economic development that barely looks beyond the Boston area. Successful economic development is local economic development, and a

key state goal should be bolstering local capacity. It also means including all populations in the state, with a focus on providing skills and creating jobs for groups that have lagged behind.

- Economic development policy must develop base resources as well as base industries. Massachusetts's resources — particularly skills and technology — help the state grow and attract businesses. In the foreseeable future, Massachusetts will not compete on the basis of low costs of labor, land, or capital. Therefore the main focus should be on increasing resource quality, not reducing costs. State spending that builds up the resource base should be viewed as investment rather than expenditure.
- Economic development policy must help the market work better. The goal is to improve the functioning of markets for labor, land, capital, and goods, not to replace these markets.
- Economic development policy must be strategic, proactive, and long term. The state should try to stay ahead of the curve rather than simply reacting to crises as they occur. Among other things, this requires depoliticizing economic development and buffering it from the annual struggle over the next year's budget.

Policy Proposals

Specific policy changes are needed in six major areas: finance, work force, information and capacity building, transportation, and the state's economic development capacity. These are framed as broadly sketched proposals.

Finance. As noted in the guidelines, the objective is to make the market work better. This requires a careful analysis of where the capital market is failing, owing to problems such as lack of information or transaction costs. Based on this analysis, state government can play several roles.

- Catalyst. For example, help to set up or give special benefits to private — but possibly nonprofit — venture capital funds, revolving loan funds, and so on.
- Broker or facilitator. Bring people together; help match supply with demand.
- Investor. As in the case of the Massachusetts Technology Development Corporation and other quasi-public financial institutions, the state may play the role of providing “the first olive out of the bottle,” especially for smaller companies, or gap financing.
- Regulation. This might include judicious use of the Community Reinvestment Act to redirect the flow of capital. Another aspect in the current credit crunch might be pressing regulators to be less conservative.

Work force. State government should direct efforts in the following areas:

- Improving education and skills. K–12 education, specific vocational education, and public higher education have all been cut back over the last few years; they, along with retraining programs, must be rebuilt and strengthened. The effort must begin with K–12; after all, only about one quarter of Massachusetts residents complete a four-year college degree, and almost one-fifth don't finish high school at all. While the state's major clusters need highly educated workers, they also need competent workers at the high school graduate level,

especially in finance and health. There may be a need to revamp the traditional curriculum. Specific vocational education and programs for the school-to-work transition help create a work-ready group of high school graduates. The point is not just to train in one specific set of skills, but to provide an understanding of the world of work that will serve wherever a student ends up. Public higher education helps train engineers, accountants, and nurses, as well as young adults with general problem-solving and communication skills — all groups that have been in short supply — and are likely to be again when the economy rebounds. Retraining is important to help workers move from one area of work to another, so that the work force can adjust flexibly to meet the needs of a fast-changing economy.

- Building “social infrastructure.” The work force needs day care and affordable housing. Especially at a time when the work force is expected to grow very slowly, infrastructure that helps to expand the potential work force plays a critical role.
- Enhancing quality of life. This is a “hidden” work-force issue. Studies show that quality-of-life factors greatly influence industrial location, because businesses are concerned about attracting and retaining mobile high-level employees. This is particularly true for industries with large numbers of professional and technical workers, like many of the main industries in the commonwealth. Massachusetts has a lot going for it in terms of natural beauty and cultural amenities, but funding cutbacks have eroded certain basic quality-of-life items like schools and public services in many areas.

Information and capacity building. This touches on several areas.

- Local capacity building. As noted in the guidelines, successful economic development is local economic development. The state should facilitate the capacity of local institutions — chambers of commerce, local planning departments, regional planning bodies, community-based organizations — to engage in economic development. The ultimate goal would be for the state to limit its direct involvement to areas in which there are economies of scale (such as data gathering) or where issues cut across different regions of the state.
- Help businesses network. Some industries are well organized, but others have not gotten together to identify and act on their needs. The state can help businesses form networks and associations for purposes like joint marketing, training, and lobbying.
- Technology transfer. Businesses, particularly smaller ones and those in mature industries, have a hard time staying on the technological cutting edge. Yet investing in process and product innovations could help them expand their markets and stay competitive. The state can play a critical role in diffusing information about state-of-the-art technology tailored to the needs of business. One possible model is the “industrial extension program,” akin to the tremendously successful agricultural extension system. It would be natural to plug this kind of technology transfer function into such existing state institutions as public schools of higher education.
- Export marketing. The state has already recognized this as an important area. Markets are becoming increasingly global, and there is the potential for

rapidly expanding markets in areas such as Eastern Europe, Latin America, and Asia. The state has economies of scale in training and assisting businesses in global marketing.

- Geographic information system. A tremendous resource for companies making location decisions would be a computerized geographic information system (GIS) that shows the location of infrastructure, transportation nodes, institutions of higher education, and so on. A GIS should probably be based at the University of Massachusetts.

Business climate. These straightforward proposals would have a payoff in good will as well as business attraction and retention.

- One-stop shopping. It would be a great boon to provide a central clearinghouse for information on all types of regulation and assistance affecting business.
- Streamline regulatory processes. To the extent possible, speed up regulatory decision making and permitting. Recognize the cost of delays to businesses.
- Customer-oriented agencies. State agencies should learn to view businesses as customers, not as adversaries. This does not mean abandoning regulations (as Porter points out, strong regulation in areas such as the environment is one element that helps breed strong global competitors). But it does mean a change of attitude.
- Market the state. This begins with steps as simple as a brochure touting Massachusetts to business.

Transportation. The rebuilding of Boston's Central Artery and digging a third tunnel beneath Boston Harbor will help relieve congestion; other region-specific projects to eliminate bottlenecks would also be important. However, in the long run the state should develop alternatives to automobile and truck transportation, particularly by upgrading the rail system. A second international airport may also be needed.

Economic development capacity. The state government must not only invest in building local economic development capacity, but must also invest in itself. Paring back in some areas may have handicapped the state's ability to plan and execute economic development. Fleshing out and acting on the previous five proposals will require research, planning, coordination, monitoring, and evaluation, in addition to the resources needed for direct implementation. State government should invest in itself in a logical way to establish these capabilities. Another important step, as noted in the guidelines, is to insulate long-term economic development strategy from year-to-year budget struggles, perhaps by setting up independent quasi-public institutions like Pennsylvania's widely hailed Ben Franklin Partnership.

These proposals build on the state's strengths. Acting on the proposals will assist Massachusetts in nourishing and strengthening its base industries. The current downturn is temporary, and the investments and improvements suggested here will help the Massachusetts economy to charge back in the years to come. Other states, as well, should undertake similar analyses of their key base industries, of their main strengths and weaknesses with respect to these industries, and the policy implications that flow from these analyses. ■

Notes

1. The conference, "Expanding the Base of Our Economy to Provide Good Jobs," cosponsored by the Massachusetts Executive Office of Economic Affairs and the University of Massachusetts, took place July 16, 1992, at the University of Massachusetts at Lowell. It was one of a series of economic strategy conferences convened by these sponsors during the summer and fall of 1992.
2. Heinz Muehlmann, "Trends in Massachusetts Base Industries," presentation at conference, "Expanding the Base of Our Economy."
3. For a discussion of these issues, see Edward Moscovitch, "The Downturn in the New England Economy: What Lies Behind It?" Federal Reserve Bank of Boston *New England Economic Review*, July/August 1990, 53–65.
4. Michael Porter, *The Competitive Advantage of Nations* (Glencoe, Ill.: Free Press, 1990); Michael Porter, and the Monitor Company, Inc., *The Competitive Advantage of Massachusetts* (Cambridge, Mass.: Monitor Company, 1991).
5. William Lazonick, "Industry Clusters versus Global Webs: Organizational Capabilities in the U.S. Economy," *Industrial and Corporate Change*, forthcoming.
6. Lynn E. Browne, "The Role of Services in New England's Rise and Fall: Engine of Growth or Along for the Ride?" Federal Reserve Bank of Boston *New England Economic Review*, July/August 1991, 27.
7. Sara Johnson, "One State's Story: Massachusetts Emerges from Recession," *DRI/McGraw Hill U.S. Review*, July 1992, 34–38.
8. *Ibid.*; Porter and Monitor Company, *The Competitive Advantage of Massachusetts*.
9. Johnson, "One State's Story," 35.
10. Muehlmann, "Trends in Massachusetts Base Industries."
11. Porter and Monitor Company, *The Competitive Advantage of Massachusetts*, 87.
12. Johnson, "One State's Story," 35.
13. *Ibid.*, 36.
14. *Ibid.*; Porter and Monitor Company, *The Competitive Advantage of Massachusetts*, 73.
15. Porter and Monitor Company, *The Competitive Advantage of Massachusetts*, 106.
16. *Ibid.*, 48.
17. Johnson, "One State's Story," 36.
18. Heinz Muehlmann, "Employment Profile of the Massachusetts Economy, 1988–1991," Massachusetts Department of Employment and Training, July 1992.
19. Porter and Monitor Company, *The Competitive Advantage of Massachusetts*, 20.
20. *Ibid.*, 14.
21. Muehlmann, "Employment Profile of the Massachusetts Economy."