

# LESS-SKILLED WORKERS & THE HIGH-TECHNOLOGY ECONOMY:

## A REGIONAL JOBS STRATEGY FOR LAWRENCE, MA

by

**Tamar Kotelchuck**

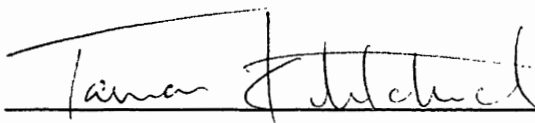
B.A. History  
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Submitted to the Department of Urban Studies and Planning in Partial Fulfillment of  
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at the  
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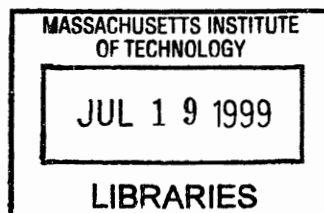


Frank Levy  
Daniel Rose Professor of Urban Economics  
Thesis Supervisor

Accepted by: \_\_\_\_\_



Paul Smoke  
Chair, MCP Program  
Associate Professor, Department of Urban Studies and Planning



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## **ABSTRACT**

This research is designed to help job training and economic development practitioners think constructively about the nature of disconnects between low-wage cities and high-wage surrounding regions. Lawrence, MA is used as a case study to examine the unique employment structures and practices of local economies. The primary goal of this thesis is to use first-hand research with regional high-technology employers to address the questions: Does high-tech regional development create living-wage job opportunities for workers who do not have four-year college degrees? If so, what type of training and assistance would be necessary to help low-income workers access these opportunities?

This analysis is conducted in seven parts. It begins with analysis of the fundamental economic dynamics of the Northeastern Region of Massachusetts, which surrounds Lawrence, MA, with a particular focus on the high-tech development along the major regional thoroughfares of Routes 128 and 495. Employment and economic dynamics in Lawrence, MA are then compared and contrasted to those of the surrounding region, with a focus on local and regional job markets for low-income city residents. After describing the interview methodology used, and outlining the criteria for living-wage work, the major findings from interviews with regional employers are summarized. Next, a brief sketch of the strengths and weaknesses of the existing Lawrence job training system in serving the working poor is provided. The last chapter outlines the rationale for public intervention and draws together information about the employment needs and practices of regional living-wage employers and evidence about gaps in the local job training system to suggest ways that an innovative job training program might create value for the City and its residents. Finally, the conclusion recaps the importance of such efforts, their rationale, and briefly outlines some major issues in implementation.

Thesis Supervisor: Frank Levy  
Title: Daniel Rose Professor of Urban Economics

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## INTRODUCTION

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*“Lawrence is the sinkhole in the lawn that must stay wet  
so the rest of the region can stay dry.”*

*Economist, Merrimack College, 1998*

By many criteria, the late 1990s are a time of unparalleled economic prosperity for the Commonwealth of Massachusetts. Headlines in the regional press (though perhaps a bit overly optimistic) herald economic growth, the creation of high-skilled, high-technology jobs, and the promise of fair economic horizons for years to come.

The impacts of this economic upturn are widely felt across the state. Jobless rates are at record lows,<sup>1</sup> state residents have experienced real and significant gains in income, both in real terms and relative to the nation.<sup>2</sup> The average income of Massachusetts residents is the third highest in the nation.<sup>3</sup> However, while a rising tide may lift all boats, it does not, in fact, lift all boats equally. The channels through which this economic opportunity flows are unevenly distributed across the Commonwealth, both in terms of geography and demography.

The City of Lawrence is a poignant study in the failure of generalized regional economic growth to create real and stable improvements in the job quality of those in most economic need. Characterized by a local economist as *“the sinkhole in the lawn, which must stay wet so that the rest of the region can stay dry,”* Lawrence represents a low-wage, low-skill, high-poverty ghetto squarely in the middle of one of the nation’s most lauded examples of economic growth: the high-technology sector along Route 128, which rivals California’s Silicon Valley in technological innovation and job creation. Numerous demographic measures speak to the extent of the disconnect between these two economies: median income in Lawrence is 60% of state and

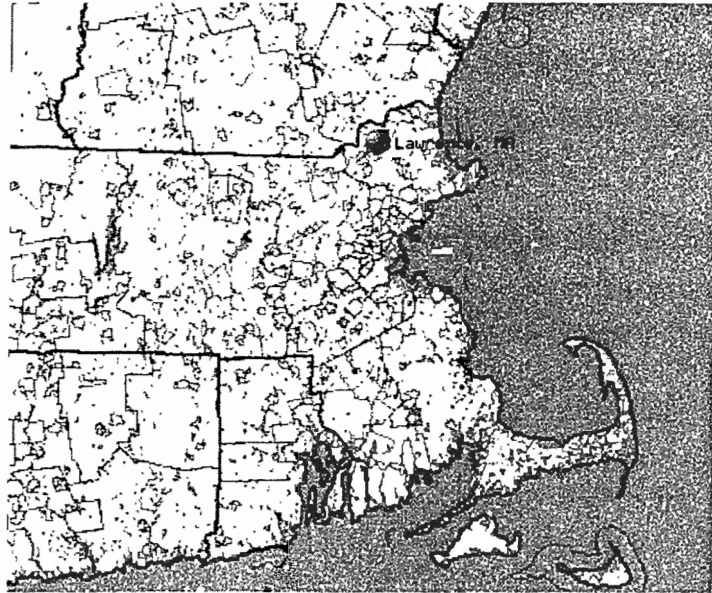
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<sup>1</sup> Blanton, Kimberly. “Jobless Rate holds at 3.3% in Massachusetts, Total Employment Near Record in October.” *Boston Globe*, 21 Nov. 1998.

<sup>2</sup> Massachusetts Institute for a New Commonwealth. *The Road Ahead: Emerging Threats to Workers and the Massachusetts Economy*. Boston, MA: MassINC, 1998.

<sup>3</sup> Blanton, Kimberly. “Bay State jobless rate drops further in August; But report hints world economic woes could hit Mass. employment hard.” *Boston Globe*, 19 Sept. 1998: F1.

regional levels; and the city has the lowest family income and indicators of wealth in the Commonwealth.<sup>4</sup>



Lawrence consistently exhibits unemployment rates two to three times those of the state, regardless of the business cycle.<sup>5</sup> However, Lawrence's employment problems are not simply quantitative. With a large proportion of residents working at wages well below that

necessary to support a family, Lawrence finds itself facing the challenge of not simply finding work, but of finding work of sufficient quality to provide a living family wage, benefits and continued employment opportunities. For this reason, Lawrence ought to be squarely in the middle of our national debate about the decline in working class wages and the prevalence of working poverty.

The causes of Lawrentians' economic isolation are not solely, nor perhaps even primarily, geographic. The job structures of the Merrimack Valley are regional, fostering extensive economic and employment interaction between neighboring cities. For example, in 1990, fully 60% of Lawrence residents were employed outside the city, and 40% of the city's workforce lived in the surrounding region.<sup>6</sup> It is difficult to provide an exact accounting of who works where and for how much, due to disconnects between business and individual data sources.<sup>7</sup> Nonetheless, the stark contrast between wages and occupations of Lawrence residents and

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<sup>4</sup> Municipal Data Bank. *Four Measures of Property and Income Wealth*. Department of Revenue, May 1999 <<http://www.magnet.state.ma.us/dls/allfiles.htm#socio>>

<sup>5</sup> Commonwealth of Massachusetts, Division of Employment and Training. *Local Area Unemployment Statistics 1980-1997*. 21 Dec. 1998 <<http://www.detma.org/local>>.

<sup>6</sup> Place of Work – Workers 16 Years and Over. *1990 Census of Population and Housing*. U.S. Bureau of the Census. 1990 <<http://www.census.gov>>.

<sup>7</sup> For example, individual data sources, namely the Decennial Census, indicate where people work, their annual income and occupation (though not by place of employment), and data collected by the Department of Employment and Training (Series ES-202) indicate average wages by industry and occupation by a variety of jurisdictions. However, no cross-correlating tools exist that would allow us to say equivocally what types of jobs and wages Lawrence residents working outside the city receive.

residents of the surrounding towns, when viewed together with information about the large percentages of Lawrentians working outside the city proper, suggests that Lawrence residents are a key source of low-wage labor for the region.

## **Theoretical/Research Context**

For those concerned with the enduring concentration of low-income families in urban America, the circumstances of Lawrence, MA should present a clear and compelling challenge. If, in fact, the benefits of generalized economic growth are inequitably distributed in a way that unfairly disadvantages urban residents – which would seem to be the case in Lawrence, and will be examined in more depth later in this thesis – we must think more explicitly about how to create mechanisms to better distribute the job opportunity created by this growth.

This examination of Lawrence takes place in the context of growing public concern for employment issues spurred by factors such as welfare reform and increasing media and public recognition of growing wage inequality. This conversation is made more urgent still by the continued decline of traditional manufacturing employment (a historical source of well-paid employment for the less-educated) and the simultaneous polarization of employment between high-paid knowledge-based employment and low-paid, low-skilled jobs in the service sector. All of these forces are at work in Lawrence, which presents an important opportunity for researchers to examine employment issues from a local perspective.

There are two fundamental reasons why locally-focused research about the nature of job opportunity for disadvantaged workers is important. First, the conversation about economic and community development has largely neglected the issue of employment quality, despite the importance of employment to any urban revitalization strategy. Second, it is crucially important that job-training practitioners, and those concerned with the job prospects of the less-advantaged, understand the economic context of job training interventions. Unfortunately, resources for this type of research are scarce, and so I hope that my work can add to the knowledge base of people facing the difficult issues of job training and placement first hand. I particularly hope that this can be of use to the people of Lawrence. Secondly, I hope that readers will find it applicable to the many other communities facing similar challenges across the nation.



## **Incorporating Employment into the Conversation about Urban Revitalization**

Increasing conversation about the importance of employment in recent years belies the fact that urban anti-poverty and economic development efforts are only beginning to address issues of living-wage employment in any comprehensive way.

Despite its stated purpose of fortifying the economic bases of American cities, too often the calculus of economic development has excluded a dialogue about employment. And, where it has taken explicit account of the employment to be created, economic development efforts often fail to incorporate a meaningful consideration of the quality of jobs created. For example, flagship urban development projects intended to increase municipal tax bases and bring employment to surrounding low-income communities – such as current plans for the redevelopment of the South Boston waterfront – often end up creating only low-wage jobs in the tourism industry.

At a fundamental level, the institutional structure of American anti-poverty efforts has evolved in such a way that those organizations and agencies concerned with urban and neighborhood revitalization (such as municipal redevelopment authorities and community development corporations) and poverty issues (such as city welfare departments) are largely isolated each other and from organizations and agencies concerned with employment (such as regional employment boards and community colleges). The result is that, despite the need for a comprehensive focus on employment issues incorporating the broad expertise of all of these institutions, knowledge and resources are rarely shared or coordinated.

One source of this oversight can be found in the traditional separation of job training systems – often seen as a form of social service for the disadvantaged and thus marginalized from the economic decisionmaking of firms – from economic development, which is intended to be responsive to the needs of businesses<sup>8</sup>. This disconnect is manifest in the fact that the two systems are governed by entirely separate bureaucracies using independent sources of funds; economic development efforts are traditionally governed by municipal authorities using flexible federal block-grant funds and local tax revenue, while employment programs are governed by regional bureaucracies which receive their funding and many of their priorities from the federal government.

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<sup>8</sup> Friedlander, Daniel and David H. Greenberg and Philip K. Robins. “Evaluating Government Training Programs for the Economically Disadvantaged.” *Journal of Economic Literature*, Dec 1997: pp. 1809-1855.

In recent years, we see growing concern for employment creation as part of a national urban agenda, but little systematic attention has been given to the quality of this employment. For example, the Clinton Administration's Empowerment Zone initiative grants tax incentives to firms locating in "distressed areas," on the assumption that they will create jobs for local residents. However, this program sets few specific benchmarks regarding the quality of work (which often turns out to be low-wage). This oversight is based on the often-mistaken assumption that the benefits of attracting and developing local businesses will trickle down, necessarily creating opportunity for low-wage workers<sup>9</sup>.

Given this historic disconnect, it is my hope that the following research, which links place-based development strategies with employment issues, can add fuel to the discourse about bridging the gap between these forces with fundamentally similar visions of urban revitalization.

### **Building the Base of Knowledge About Local Employment Structures and Opportunities**

*There are few national problems that remain as intransigent and compelling as the need to find ways to connect residents of disadvantaged communities to good, stable jobs in the economic mainstream...As the gap between the disadvantaged and good jobs has widened, the need for sophisticated information about the labor market has grown...It is the view of the authors that creative information-gathering techniques can be enormously powerful in community-based work. While it is generally the exception rather than the rule, some pioneering techniques have been devised that can help practitioners and their participants to more clearly visualize the path out of poverty [and enable] community based practitioners to have clear and current information on occupation-specific industry trends – often even in advance of many employers in the industry.<sup>10</sup>*

Aspen Institute, Labor Market Profiling, 1997

In the context of welfare reform and increasing awareness of working poverty, many anti-poverty organizations and institutions are stepping up to the plate in attempts to alter the job prospects of lower-skilled workers. Within these professional communities, there is a growing consensus that employment efforts must be based in an accurate and economically sophisticated

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<sup>9</sup> Clarke, Susan E. "Enterprise Zones: Seeking the Neighborhood Nexus." *Urban Affairs Quarterly*, 18.1(1982):53-71.

<sup>10</sup> Clark, Peggy and Kays, Amy. *Labor Market Profiling: Case Studies of Innovative Information-Gathering Techniques for Employment Projects*. Washington, DC: The Aspen Institute, 1997: Introduction.

understanding of the nature and needs of the local labor market. One approach to developing locally-specific jobs strategies that has become popularized in workforce training circles in recent years is the “sectoral employment strategy.” This approach, often spearheaded by community-based, non-profit organizations, is based on the belief that the most effective approach to employment training focuses on the needs and barriers to employment for specific populations in a promising part of the region’s economy (linked either by products, resources, markets or employment needs).<sup>11</sup> These strategies are advocated because they allow job training programs to leverage knowledge about specific industries and their employment needs, build stronger networks with participating employers, and marshal more specific training expertise. Practitioners hope that all of these factors will ultimately result in the development of job training programs which can train workers to be more useful to industry thus creating mutually beneficial partnerships between the training programs and employers, and increasing the possibility of job placement.

Despite the consensus about the need to craft employment efforts to local business and community needs, many communities lack the information necessary to create sectoral strategies effectively. There is little funding to support such time-intensive research by independent parties, and the need for employment services is so great in most low-income communities that investment in this research (with long-term benefit) would draw resources away from the provision of employment aid to those urgently and immediately in need.

Therefore, I am conducting this research in the hope that the content of my findings, and the process I use to arrive at them, can add to the base of knowledge underlying job training efforts in Lawrence and elsewhere.

## **Methodology**

There are many ways to examine the issue of how to improve the distribution of benefits from economic growth to less-advantaged areas. I have chosen to focus my examination on: a) how trends in working poverty and job quality play out in a specific economy – the city of Lawrence – and b) the nature of regional demand for labor and the opportunities that it might present for connecting Lawrence residents with living-wage jobs in the regional economy.

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<sup>11</sup> Kazis, Richard. *New Labor Market Intermediaries: What’s Driving Them? Where Are They Headed?* Boston: Task Force on Reconstructing America’s Labor Market Institutions, Unpub. Working Paper #WP03, 1 Nov. 1998.

If, in fact, Lawrence residents do provide a low-wage labor force for the region, what would induce employers to raise their wages? The hypothesis that will be tested through this research is that:

- a) Employers experience skill shortages in certain entry level jobs that would make them willing to pay a premium for reliable, semi-skilled workers that could be developed through a high-quality training program.
- b) Hiring and recruitment practices of these firms, because of inadequate information about the skills and capacities of Lawrence workers, make it difficult for Lawrence residents to access higher-quality jobs.
- c) Public pressure could be brought to bear on large regional employers to dedicate training dollars and employment slots to disadvantaged workers, under the rationale that the distribution of living-wage non-college employment from these firms has excluded workers from Lawrence, and should be more equitable.

The following research aims to deepen the understanding of job structures in promising industries surrounding Lawrence; to understand what living-wage job opportunities these industries may hold for Lawrence residents; and to understand if and why there is a disconnect between Lawrence residents and these opportunities. Ultimately, this research is designed to give practitioners and policymakers the information necessary to think constructively and concretely about bridging the gap between the city and the regional economy. A crucial element in developing such strategies is a grounded understanding of the internal hiring and production dynamics of high-growth regional industries that ultimately determine what jobs exist and who gets chosen to fill them.

Specifically, this study attempts to identify living-wage jobs that could be filled by Lawrence's low- and semi-skilled workers, with the assistance of an education and job-training program designed to meet locally specific needs. This research is conducted through regional economic analysis, coupled with extensive interviews with regional employers. My primary focus is identifying employment opportunities; that is, the demand side of the employment equation. Secondarily, and more briefly, I will examine the supply of labor, and mechanisms for bridging the two, addressing the questions: 1) What types of services might a particular subgroup of residents seeking living-wage employment need in order to successfully compete for

and retain these positions?, and 2) What do my findings about regional employment, when viewed in light of the local labor market, imply about how to design a successful job-training program?

This thesis is divided into seven parts. The first chapter based on extensive economic analysis, is meant to convey sources of growth in the regional economy -- with an eye towards sources of living-wage employment growth -- and outlines the sectors I have chosen for further research. The second chapter, on Lawrence's history, demographics and labor force, is intended to give the reader an understanding of the level and sources of economic distress facing residents of the City of Lawrence, as well as some of the characteristics of Lawrence's working poor. The third chapter briefly describes the interview methodology used to gather primary data, and notes some of its pitfalls. The fourth chapter outlines the criteria for judging living-wage jobs, and the need for such a measure. The fifth chapter describes the findings of extensive primary research with employers in regional growth industries about the existence of living-wage jobs, their requirements, hiring practices and the outlook for the future of this work. The sixth chapter provides a sketch of the strengths and weaknesses of Lawrence's job training system in connecting the working poor to job opportunities in the regional economy. The seventh chapter conveys the implications of these findings for the creation of a job training program capable of effectively connecting the working poor in Lawrence with living-wage work opportunities in the surrounding region. Finally, the conclusion discusses the rationale for public involvement in job training, and some of the challenges to implementing such a program.

## **CHAPTER 1**

### **REGIONAL ECONOMIC DYNAMICS**

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#### **The Context: State and Regional Economic Growth**

Lawrence's economic distress occurs at a time of nearly unparalleled economic growth in the state of Massachusetts. In 1997 the Commonwealth had the third-highest level of per-capita income in the United States (23% higher than the national average) and the second-fastest growth rate in income. Unemployment is at historically low levels, nearly 30% below the national average, with unprecedented levels of labor force participation.<sup>12</sup>

The Massachusetts economy has recovered from the early 1990s recession to perform better than almost any other state in the nation, according to many economic indicators. The Commonwealth has outperformed the nation in employment growth, showing employment gains in almost every major economic sector, led by high-tech and service employment. The state has shown solid growth in business services, private services, engineering and management services, health services and high-technology manufacturing (office equipment, electronics and computer manufacturing).<sup>13</sup> The state also has the third highest concentration of fastest-growing companies in the nation and the second highest in high-technology fastest-growing companies.

Similar to regions across the country over the last 40 years, much of this new growth and development has occurred along major transportation routes surrounding large metropolitan areas. Much of the high-technology growth in the Boston Metropolitan Region has centered along Route 128, along the northern border of the metro area, passing through the towns: Wayland, Woburn, Bedford, Burlington, Concord, Lexington, and Lincoln. This development has rippled outward so that it now encompasses much of the northern region of Route 495, including: Acton, Andover, Billerica, Boxborough, Chelmsford, Littleton, Lowell, North Andover, Tewksbury, Westford, and Wilmington. Both of these routes span Essex and Middlesex Counties.

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<sup>12</sup> Department of Economic Development. *Massachusetts Economic Highlights*. November 1998  
<<http://www.magnet.state.ma.us/econ/keyindic.htm>>.

<sup>13</sup> Liu, Jenny. "The Economic Performance of the New England States in 1997." *New England Economic Indicators*. Boston: Federal Reserve Bank of Boston, June 1998.

# Northeastern Massachusetts







Because the boundaries of this economic region do not correspond with standard data classifications, it is difficult to provide a good deal of evidence to support widely-accepted claims of the economic vitality of this region. However, by many counts the Northeast region has mirrored or surpassed the state's economic growth, showing the same level of new business creation (10%) as the Commonwealth, and a slightly higher level of job creation (9% vs. Massachusetts 8% from 1995 to 1998).<sup>14</sup>

Another strong proxy for business growth and profitability, though, is the demand for office space. Using these data, we can see steady and strong business growth over the past two years, particularly along the Route 128 corridor, where rents are only slightly lower than within the City of Boston. The outlook for continued employment growth is improving with recent additions to regional employment from major software, communications and business machine corporations, which have recently committed to relocation along these two routes.<sup>15</sup>

### **Economic Growth in Northeastern Massachusetts: The Importance of High-Technology Industry**

The two economic mainstays of Northeast Massachusetts are the manufacturing and service industries. Manufacturing comprises approximately 25% of regional employment, a figure significantly higher than the state average of 15%, and services composes approximately 37% of employment, a few points lower than the state average of 41%. Retail trade, employing close to 20% of the regional workforce (almost 130,000 people) is also an increasingly important, though low-wage, sector. Wholesale trade, employing almost 7% of the regional workforce, is relatively strong in the region and seems to be holding steady, due to the region's strategic location vis-à-vis major highway systems and ports.

Alternatively, the finance, insurance and real estate industry (FIRE) in Northeastern Massachusetts has never been as strong as other parts of the state. The region has not shared in the growth of this cluster in Boston – centered around security and commodity brokerage and mutual fund management – and, consequently, FIRE only employs less than 5% of the regional workforce, generally in lower-quality and lower-prestige jobs than the Metro Boston area.

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<sup>14</sup> Farrant, Robert. "The Northeast Region: Geography and Brief Economic History." Amherst: forthcoming in *Massachusetts Benchmarks*, Spring 1999.

<sup>15</sup> Meredith & Grew, Inc./ONCOR International. *Greater Boston Market Report*. Boston, MA. Second Quarter 1998.

As in Massachusetts, the competitive edge of economy of the Northeast region is highly dependent on what many have termed “the innovation economy” – which is defined as the “*intellectual capital and the ability to translate new ideas into competitive products faster than the competition can.*”<sup>16</sup> These firms are often concentrated in technical areas, and focus largely on the design and development and custom-production activities, rather than mass-production (which can often be conducted less expensively in lower-cost states). These cutting-edge businesses often seek to proximity to research universities, and other high-tech firms, which allow them easier access to new technology and ideas. As a result of the high concentration of high-tech firms and of universities, Massachusetts is one of the leading states in the nation for innovation businesses (second only to California).

The link to innovation is particularly important in the high-technology services – such as software development and sales, telecommunications technology and consulting – and in high-technology manufacturing sectors – such as medical instruments and internet technology production. Both sectors represent significant engines of growth in the larger regional economy. Lucent Technologies, one of the nation’s leading telecommunications firms, for example, is located in Northeastern Massachusetts because of its stated desire to be in close contact with its high-technology suppliers so that it can maximize interfirm communication and minimize the time needed to resolve production problems.<sup>17</sup> Because these firms have a strong competitive advantage in the region, they are the chief target of my primary research with employers.

The technology and skills needs of high-tech industry should also make it central to regional employment efforts. Specifically, in this sector of the economy the pace of technological change means that this is a quickly-changing industry with firms that are constantly in search of new skills. This trend has mixed impacts for less-skilled workers. Clearly, this constant change has accelerated this industry sector’s need for highly-educated professionals, particularly in technical specialties. One interesting example of the demand which high-tech industry creates for high-skilled workers can be found in the recent tug-of-war over increasing immigration quotas of highly-skilled professionals to Massachusetts, advanced in

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<sup>16</sup> Massachusetts Technology Collaborative. *Index of the Massachusetts Innovation Economy, 1998*. Westborough, MA: Massachusetts Technology Collaborative, 1998.

<sup>17</sup> Unpublished Interview conducted by Robert Farrant, University of Massachusetts - Lowell, 1999.

large part by high-tech industry leaders.<sup>18</sup> While many speculate that growth in this sector has ripple affects across the economy, little research has been done on how this trend directly impacts less-skilled workers. Whether high-technology industry provides any significant number of well-paying jobs for people who are not highly-skilled is, therefore, also the focus of this research.

## **Criteria for Targeting Promising Employment Sectors**

As previously stated, I believe it is important to focus on specific employment sectors when designing a jobs strategy because it allows job training developers to leverage their technical expertise and to maximize their networks within the employer community. To this end, for purposes of primary employment research, I chose to focus on two “promising” sectors of the regional economy. Economists hold differing views on what constitutes a “promising” employment sector because of the difficulties in reliably projecting economic trends. Ultimately, I posit that choosing “promising” sectors is a judgement call in which one must balance a range of criteria including:

1. ***Positive employment growth:*** Some economists would posit that “promising” sectors are those which experience growth rates equal to or higher than state or national average job creation rates.<sup>19</sup> While positive growth is certainly an important indicator of a sector’s economic prospects, it cannot be the sole criteria for good employment targets because high employment growth may be short-lived or occur only in relatively low-employment sectors.
2. ***Large proportion of regional employment:*** To offset the shortfalls of choosing sectors based only on their growth rates, I chose to examine and rank employment sectors also by the absolute numbers of people they employ. This is an important consideration because, for example, some sectors may demonstrate low growth but may also represent a large number jobs in the region. Sectors such as these may hold real and important employment opportunities due solely to job turnover, despite low growth rates.

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<sup>18</sup> Rosenberg, Ronald. “Half a world away, a high-tech SOS is heeded; As firms and unions bicker over visa program, foreign workers make a home in Greater Boston.” Boston: *Boston Globe*, 7 March 1999: p.G1.

<sup>19</sup> Interview with Richard Lester, Director, Industrial Performance Center, April 26, 1999.

3. ***Moderate average wages:*** Clearly, wages are a central consideration in targeting sectors of the economy that might present good employment opportunities for the less-skilled. However, it is difficult to get a strong handle on wages by industry sector because these data are generally kept in the form of average wages, encompassing both high- and low-paying occupations within a given industry. As a result these data must be used cautiously because a high average wage in an industrial sector may reflect widely different realities for less-skilled workers depending on the range of wages within the industry. However, average wage data is equivocal on the downside, which is to say that low average wages can only mean that either everyone gets paid poorly, or some get paid well, and many get paid very poorly. To this end, I chose to exempt from my consideration industrial sectors, such as retail, which have low regional average wages.<sup>20</sup>
4. ***Balanced Occupational Distribution:*** Another consideration in targeting possible employment sectors is the degree to which they utilize non-college labor. Unfortunately, again, the lack of available information on industry occupational profiles prohibits a sophisticated analysis of these employment patterns based solely on secondary data. This information is, however, at least capable of telling us which sectors do not employ non-professional workers<sup>21</sup>.

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<sup>20</sup> Despite the fact that low average-wage sectors may possess higher-paying subsectors.

<sup>21</sup> The main source of information on this topic can be found in the Occupation by Industry Calculations of the 1990 Census, which can be extracted only to a state level.

## Target Employment Sectors

### Manufacturing

As stated earlier, the Northeast Region is more dependent on manufacturing than the state as a whole. This is at once a disadvantage and an advantage. Most people are by now well-acquainted with the dangers of over-dependence on manufacturing. Manufacturing, particularly low-technology, low-cost manufacturing, has proven quite vulnerable to international and domestic cost pressures and has hence been an unstable source of jobs through the 1980s and 90s. However, this sector is also a source of relatively high-wage jobs for people who lack a college education.

Economic theory would suggest that as business mobility grows, low-technology, labor-intensive industries will seek out sites where they can minimize their labor costs. This would seem to suggest that, over time, this type of manufacturing will leave Massachusetts, which is a relatively high-cost, high-wage state. A number of regional economists, interviewed by the author, confirm that this trend is in fact occurring at a significant level in Massachusetts. That is, low-technology manufacturing jobs – exemplified by the decline of the textile industry in Lawrence in the 1980s – have steeply declined in recent decades (though this trend is slightly eased by recent economic upturns) due to international competition, cost pressures and relocation. In fact, Massachusetts was severely (and perhaps disproportionately) impacted by declines in low-technology manufacturing across the nation in the early '90s due to the relatively high cost of doing business (that is, the cost of production inputs such as land and labor) in the Commonwealth.

It is less clear that relocation pressures will negatively affect high-technology manufacturing in the region, for a number of reasons. On the surface, high-technology manufacturing – after the recession and decline of the micro-computer industry in the early 1990s – had been adding jobs across the region at a fairly good clip, until turbulence in the international economy reduced the demand for exports in the latter part of 1998.

Why might we expect different trends in the high-technology production sector than in other, more traditional, manufacturing sectors? First, these firms are fairly capital-intensive and sophisticated, which reduces their labor costs and increases the skill requirements which their

manufacturing workforce must possess. Second, many of these firms are involved in cutting-edge technology design as well as production, which makes it necessary for them to be located near skilled engineers and university thought-centers. While it may become easier over time to move production of these high-technology goods farther from the place where the ideas originate, it is likely that their production will always require significant input from skilled engineers, and thus more proximity to this workforce than in other manufacturing sectors.<sup>22</sup>

This competitive edge would seem to explain a good deal of the growth in high-technology manufacturing in the Northeast Region in the mid- to late- 1990s. This growth is manifest in the following sub-industries:<sup>23</sup>

Manufacturing Sector	Total Regional Employment	% of Total Regional Employment	Average Annual Wage	Employment Growth Rate 1995-97
Electronic & Other Electrical Equipment (SIC 36)	27,335	4.10%	\$ 47,101	5.24%
Industrial Machinery & Equipment (SIC 35)	21,029	3.15%	\$ 54,704	7.92%
Instruments & Related Products (SIC 38)	15,173	2.28%	\$ 50,087	-3.49%

### The Service Industry:

The single term “the Service Industry,” as defined by the Standard Industrial Classification system masks the complexity of firms in this category which range from universities to movie theaters, containing both janitors and CEO’s of international management consulting conglomerates. In reality, this category is an outdated “catch-all” for firms other than traditional SIC-code defined industries (including: agriculture, mining, trade, FIRE, transportation, retail and manufacturing). Notwithstanding their diversity, these firms are key players in the Massachusetts economy and are only slightly less important in the Northeast region. Top service employment sectors in the Northeast include:<sup>24</sup>

<sup>22</sup> Interviews with Yolanda Kodrycki, Assistant Vice President and Economist, Federal Reserve Bank of Boston, and Bob Farrant, Economist and Historian, Department of Regional Social and Economic Development, University of Massachusetts at Lowell.

<sup>23</sup> Source: Authors calculations, based on: Department of Employment and Training. *Series ES-202, 3-digit SIC Code Level, Service Delivery Areas: Northern Middlesex, Lower Merrimack Valley, Southern Essex, Metro North*. Boston: Department of Employment and Training, 1997.

<sup>24</sup> Source: Ibid. Department of Employment and Training.

Service Sector	Total Regional Employment	% of Total Regional Employment	Average Annual Wage	Employment Growth Rate 1995-97
Health Services (SIC 80)	74,539	11.18%	\$ 31,007	1.91%
Business Services (SIC 73)	73,629	11.04%	\$ 42,250	23.14%
Engineering and Management Services (SIC 87)	36,888	5.53%	\$ 64,512	8.02%

Given the sheer size of this sector and its increasing prominence in the nation, state and region, it is important that those concerned with less-skilled employment understand how growth in this sector is likely to impact people without college degrees. The diversity of the sector, however, makes meaningful or accurate generalizations quite difficult. Given the limited scope of my research, I settled for examining only one of these sectors – the Business Services Sector – due primarily to drawbacks in health services and engineering and management services as employment sectors for the less skilled.

Health Services, the top service employer in the region, is a good source of employment for non-college workers, and is growing rapidly across the U.S. However, in the Northeast region growth has been less dramatic, and much of it is due to the rise in nursing home and home care employment, which are often poor-quality, low-wage, limited-advancement jobs for people who lack medical training. Hospitals, alternatively, tend to be higher-quality employers; they pay relatively high wages, are often unionized, and have fairly complex job ladders which allow for internal advancement. However, trends in health care in the region and across the US – including increasing outpatient and home care, as well as mergers and acquisitions of major hospital centers – mean that hospital employment in Massachusetts has decreased significantly over the past three to five years. While hospital employment may have stabilized in the past year, there is little information that indicates any employment growth. Thus, we can extrapolate that the growth in this sector is largely due to the increase in poor-quality jobs. As a result, I have chosen not to examine the health services sector for purposes of this study. Nonetheless, the importance of the health sector for employment efforts should not be overlooked, because even replacement needs created by staff turnover in hospitals are a fairly significant source of non-degree employment. Furthermore, Lawrence is home to two large regional health

employers, Lawrence General Hospital and the Greater Lawrence Family Health Clinic, both of which struggle to locate Spanish-speaking health professionals.

Management and Engineering Services is at this point a relatively small employer compared to other parts of the service economy, but it has shown relatively rapid growth in the region and the state over the past decade. Nonetheless, a cursory analysis of occupational employment patterns shows that management and engineering services employ primarily high-skilled workers, with between 56% and 81% of occupations in this area requiring a college degree.<sup>25</sup> Thus, it seemed advisable to look elsewhere for large quantities of high quality jobs for non-college graduates.

As the only remaining of the three leading service sector employers, I chose to examine the business services sector. Business services is a complex and interesting sector for anyone concerned with employment in the Commonwealth. One of the larger, and certainly the fastest-growing, areas of the service industry, this sector defies easy explanation, and captures a range of industries and occupations from janitors to database managers. Taking a closer look at this sector we see that it is composed of the following diverse sub-sectors<sup>26</sup>:

Business Services Subsectors	Total Regional Employment	% of Sectoral Employment	Average Annual Wage
Computer and data processing services (SIC 737)	29,889	41%	\$ 69,753
Personnel supply services (SIC 736)	19,558	27%	\$ 23,148
Services to buildings (SIC 734)	8,847	12%	\$ 13,466
Misc. Business services (SIC 738)	8,537	12%	\$ 25,369
Mailing, reproduction and stenographic (SIC 733)	3,300	5%	\$ 35,090
Misc. Equipment rental and leasing (SIC 735)	1,080	1%	\$ 33,970
Advertising (SIC 731)	851	1%	\$ 53,698
Credit reporting and collection (SIC 732)	611	1%	\$ 33,128

My research has focused on large employers in all of these sectors, despite their diversity, because I thought it important to better understand the composition of these businesses, their

<sup>25</sup> Author's calculations based on: Employment by Occupation: Massachusetts Cities, Towns and Selected Other Areas. 1990 Census of Population and Housing. U.S. Bureau of the Census. CD-ROM. 1990.

<sup>26</sup> Author's calculations based on: Ibid. Department of Employment and Training.



diversity, and their evolving labor needs so as to be able to speak with more certainty about how growth in this sector might impact less-skilled employment opportunity in the region.

**Conclusion:**

Analysis of secondary employment and wage data for the region surrounding Lawrence suggests that high-tech manufacturing and business services may be good sources of employment for less skilled workers in the region. However, secondary economic data is very limited in its ability to provide detail about the quality or quantity of non-college work opportunity in today's economy. As a result, I supplemented secondary economic analysis with extensive primary research on non-college employment trends in these two sectors, which is used to confirm and inform the analysis in this chapter.