

June 01, 2007

The Net Fiscal Impacts of Workers Employed in Biopharmaceutical-Related Industries of Massachusetts

Ishwar Khatiwada

Northeastern University - Center for Labor Market Studies

Joseph McLaughlin

Northeastern University - Center for Labor Market Studies

Andrew Sum

Northeastern University - Center for Labor Market Studies

Paulo Tobar

Northeastern University - Center for Labor Market Studies

Recommended Citation

Khatiwada, Ishwar; McLaughlin, Joseph; Sum, Andrew; and Tobar, Paulo, "The Net Fiscal Impacts of Workers Employed in Biopharmaceutical-Related Industries of Massachusetts" (2007). *PhRMA Research Reports*. Paper 12. <http://hdl.handle.net/2047/d10015553>

**The Net Fiscal Impacts of Workers Employed in
Biopharmaceutical-Related Industries of Massachusetts**

PhRMA Research Paper No. 12

**Prepared by:
Ishwar Khatiwada
Joseph McLaughlin
Andrew Sum
With
Paulo Tobar**

**Center for Labor Market Studies
Northeastern University**

**Prepared for:
The Pharmaceutical Research and Manufacturers Association of America
(PhRMA)**

June 2007

Introduction

During the past year, the Center for Labor Market Studies has undertaken a diverse array of research activities to identify the economic impacts of biopharmaceutical-related industries in Massachusetts and the U.S. A series of research papers describing and assessing employment levels and trends, occupational characteristics of jobs, demographic and human capital characteristics of the employed, annual earnings of workers, output levels, productivity levels, profits, and research and development expenditures of biopharmaceutical-related industries in Massachusetts and the U.S. were prepared by CLMS staff.¹

In addition to their employment, earnings, output, and research and development impacts, the biopharmaceutical industries also generate a set of direct fiscal impacts on federal, state, and local government. Workers in biopharmaceutical-related industries of Massachusetts and the U.S. make large, net positive fiscal contributions by paying high amounts of taxes to local, state, and federal governments through the combined payroll, federal and state income, sales, and property taxes paid by workers employed in these industries. As a consequence of their higher mean annual earnings and the high elasticity of the federal and state income tax systems, biopharmaceutical industry workers can be expected to pay more on average annually in payroll and state/federal income taxes than their employed counterparts in all other industries of the state combined. Due to their higher annual earnings from employment and relatively high family incomes, biopharmaceutical industry workers are less dependent than other workers on both cash and in-kind transfers (food stamps, rental subsidies, Medicaid) from state and federal governments. Biopharmaceutical industry workers and their families also are more likely to own their home, own higher valued homes, and pay more in property taxes to local governments. Finally, due to higher rates of health insurance coverage from their employers, workers in biopharmaceutical-related industries are less likely to depend on the Medicaid or Medicare systems for their health care coverage and, thus, impose fewer health care costs on the rest of society. On average, biopharmaceutical industry workers are also healthier than other workers and less likely to be in need of comprehensive health care treatment at least in the near future.

¹ For an example of these studies that is particularly relevant to the finding of this research report, see: Andrew Sum and Ishwar Khatiwada with Sheila Palma, [The Annual Earnings of Workers in Biopharmaceutical-Related Industries of Massachusetts and the U.S.: A Comparative Assessment](#), Center for Labor Market Studies, Northeastern University, Prepared for Pharmaceutical Research and Manufacturers Association of America (PhRMA), Boston, 2007.

This research paper is primarily designed to estimate the net fiscal contributions of biopharmaceutical-industry workers to the budgets of federal, state, and local governments in calendar years 2004 and 2005. We will begin by reviewing the mean annual earnings of biopharmaceutical-industry workers and all other workers in Massachusetts and the U.S. in recent years. This will be followed by a description of the data sources and methodologies used to estimate the net fiscal contributions of workers, including sources of tax revenues and the receipt of various types of cash and in-kind transfers from the state and national government. Findings of our estimates of the net annual fiscal contributions of workers will then be presented. This will be followed by a brief review of the home ownership rates of workers employed in biopharmaceutical-related industries of the state, the median values of their homes, and their annual property tax payments. The final section of the paper will examine the health insurance coverage rates of biopharmaceutical industry workers, their coverage by health insurance plans financed at least in part by their employers, and their dependence on Medicaid and Medicare systems for their health care.

The Annual Earnings of Workers in Biopharmaceutical Industries and Other Industries of Massachusetts and the U.S.

The annual amount of Social Security payroll, state income, and federal income taxes paid by workers will be primarily dependent on their annual earnings from employment, including wages and salaries as well as self-employment income.² Social Security Payroll retirement taxes rise with the level of earnings up to an annual maximum³ while federal income taxes rise more than proportionately with income due to the progressivity of the of the federal income tax. State income taxes in Massachusetts rise proportional to income once the minimum tax income threshold has been reached.

Mean annual earnings of employed persons (16 and older) in all biopharmaceutical-related industries of Massachusetts exceeded \$75,000 in 2004-2005. The mean annual earnings of these workers ranged from a low of \$59,000 in medical equipment and supplies manufacturing industries to a high of \$83,350 in scientific research and development industries

² State and federal income tax liabilities also will depend on the amount of property income, retirement income, the marital status of the individual, and the number of exemptions and deductions.

³ The maximum amount of annual earnings subject to the social security retirement tax in calendar year 2006 was \$94,200. The Medicare portion of the tax (1.4%) is not subject to upper earnings limit.

of the state. The mean annual earnings of employed persons in the state’s biopharmaceutical-related industries exceeded the mean for all employed persons in the state by more than \$32,000 or 67%. (Table 1 and Chart 1). The higher mean annual earnings of biopharmaceutical-industry workers in our state was attributable to a combination of higher hourly earnings backed by higher labor productivity and to more hours of work during the year.

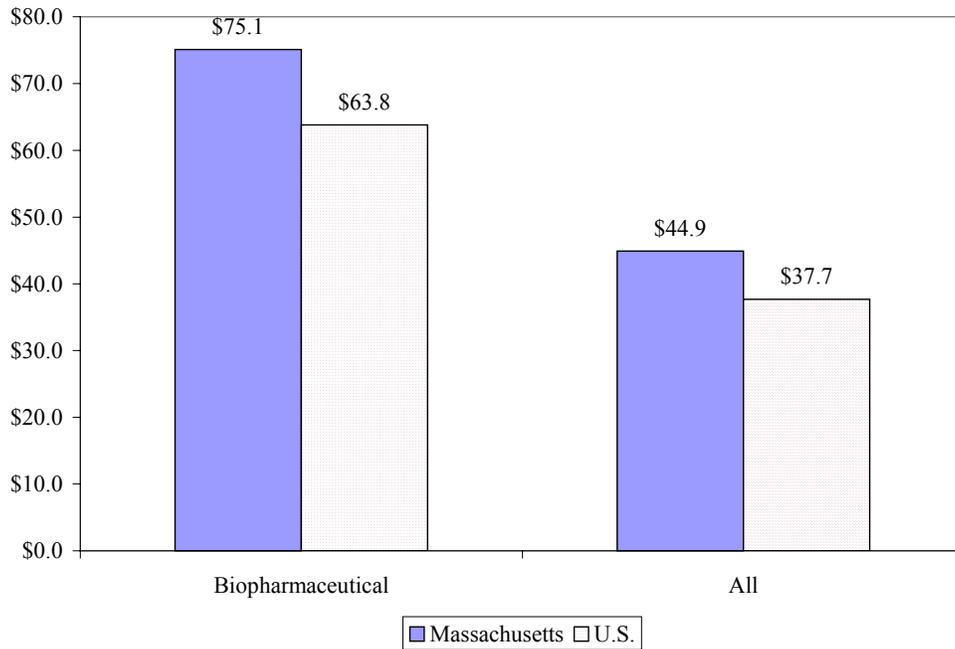
Nationally, workers in biopharmaceutical-related industries also obtained mean earnings considerably above those of all workers. Mean annual earnings of U.S. workers in biopharmaceutical industries were \$63,839, which were \$26,000 or 69% above those of the average employed person in the country during 2004-2005.

Table 1:
Mean Annual Earnings of Employed Persons (16 and older) in Biopharmaceutical-Related Industries and All Industries of Massachusetts and the U.S., 2004-2005

Industry Group	(A)	(B)
	Massachusetts	U.S.
All Biopharmaceutical-Related industries	\$75,083	\$63,839
• Pharmaceutical and Medicine mfg.	80,331	75,995
• Medical equipment and supplies mfg.	59,513	53,253
• Scientific Research and Development	83,352	63,849
All industries	\$44,941	\$37,707
Biopharmaceutical-Related as % of All Industries	167%	169%

Source: 2005 American Community Surveys, public use files, tabulations by authors.

Chart 1:
Mean Annual Earnings of Employed Persons (16 and older) in Biopharmaceutical-Related Industries and All Industries of Massachusetts and the U.S., 2004-2005 (in \$1,000)



Net Fiscal Impacts of Workers in Biopharmaceutical-Related Industries of Massachusetts

Workers in biopharmaceutical-related industries make large net positive fiscal contributions in Massachusetts by paying a high mean amount of taxes to local, state, and federal government and relying relatively little on government for cash and in-kind transfers. As will be revealed below, the net fiscal impacts of workers employed in biopharmaceutical-related industries tend to be among the highest of workers in the state and nation. As noted in our preceding section, biopharmaceutical-related industry workers are characterized by higher mean annual earnings than their employed peers in other industries, and they will end up paying considerably more in Social Security payroll taxes and state/federal income taxes on these incomes. Biopharmaceutical-related industry workers also impose relatively small fiscal burdens on state and federal governments because they are less likely than other workers to depend on government for cash and non-cash transfer incomes, such as food stamps, rental subsidies and Medicaid to support themselves.

To quantify the size of these annual tax payments to state and federal government and the monetary value of the cash and in-kind transfers that they received, we analyzed data from the U.S. Census Bureau on the March 2005 and March 2006 Current Population Survey Supplements. The March CPS household survey contains a work experience and income supplement that collects a wide array of data from households on their income sources during the previous calendar year as well as their receipt of a wide array of cash and in-kind benefits, including food stamps, rental subsidies, federal and state earned income tax credits, energy assistance, and Medicaid/Medicare benefits.⁴

The Census Bureau imputes estimates of the likely amount of Social Security payroll taxes, federal retirement contributions, state income taxes, and federal income taxes paid by each working-age individual based on their annual incomes, marital status, and family living arrangements. We have combined data on the estimated tax payments, cash transfer incomes (including federal and state earned income tax credits), and in-kind benefits to calculate the net fiscal impacts of biopharmaceutical-related industry workers and those of all industries in Massachusetts during calendar years 2004 and 2005.⁵ Table 2 displays a listing of the tax items, cash transfers, and non-cash transfers included in our fiscal cost-benefit analysis for government. The fiscal analysis was undertaken for all employed persons in biopharmaceutical-related industries and all other industries. The estimates pertain to residents of Massachusetts regardless of the location of their jobs.

For workers in biopharmaceutical-related industries, we have estimated the value of the combined income and payroll taxes that they paid during the calendar year and the value of the cash and in-kind transfers that they received.⁶ The net fiscal benefits to the federal and state government are equal to the difference between the annual taxes paid by an individual and the value of the cash and in-kind transfers that he/she received on average during calendar years 2004 and 2005.

⁴ Information on the features of the March CPS supplement questionnaire can be found on the U.S. Census Bureau web site. See: www.census.gov, "2006 Annual Social and Economic Supplement (ASEC)."

⁵ The combined sample from the two March CPS surveys was used to obtain a larger sample size of observation for the estimates of these net fiscal benefits. Two year weighted averages were used to represent the results.

⁶ Food stamps, rental subsidies, and energy assistance are received by the household rather than by an individual unless he/she is living alone. For each adult household head, we assigned him/her the value of these benefits received by the household in which he/she lived.

Table 2:
A Listing of the Cash Transfer, Non-Cash Transfer, and
Personal Tax Items Used in Conducting the Fiscal Impact Analysis

Total Costs to Government		Total Benefits to Government
Cash Transfers	Non-Cash Transfers	Tax Receipts
Unemployment benefits	Market value of food stamps	Federal income tax liability
Worker's compensation	Market value of Medicare insurance	State income tax liability
Social Security retirement benefits payments	Market value of Medicaid benefits	Federal retirement payroll deductions
Supplemental Social Income for the disabled and aged	Family market value of housing subsidies	Social Security retirement payroll taxes
Public assistance income	Energy assistance payments	
Veteran's payments		
Survivor's income benefits		
Earned Income Tax Credits		
Other disability incomes		

How much did workers in biopharmaceutical industries pay on average to the federal and state government in the form of Social Security Payroll and state and federal income taxes and how much did they receive in the form of both cash and non-cash transfer incomes in recent years in our state? Tables 2 and 3 provide estimates of these values for resident workers in Massachusetts. These estimates are two-year annual averages for calendar years 2004 and 2005 adjusted for inflation as measured by the national Consumer Price Index for All Urban Consumers (CPI-U).

As revealed earlier, Massachusetts' workers in biopharmaceutical-related industries are characterized by above average annual earnings. As a result, these workers will pay higher Social Security payroll taxes or federal government retirement taxes.⁷ In Massachusetts, the mean annual amount of Social Security taxes or federal government retirement taxes paid by workers in biopharmaceutical-related industries was \$4,843, which was \$1,644 more than the payroll taxes paid by the average worker in all industries of Massachusetts combined. (Table 3).

⁷ The 6.2% Social Security payroll tax financing for the retirement system is subject to a maximum earnings level (approximately \$91,500 in 2005) while the Medicare portion of the tax has no upper limit.

Workers in biopharmaceutical-related industries also paid considerably more in both state and federal income taxes than did their peers working in other industries. The annual mean state income taxes paid by workers in biopharmaceutical-related industries exceeded that of workers in all other industries by \$1,342 (\$3,334 versus \$1,992). Given the progressivity of the federal income tax, the mean annual size of the federal income taxes paid by workers in biopharmaceutical-related industries in Massachusetts in 2004-2005 was \$12,843, which was more than two times higher than the mean amount of federal taxes paid by workers in all industries. For these three types of taxes combined, workers in biopharmaceutical-related industries in Massachusetts paid a mean amount of \$21,019 versus only \$11,340 for workers in all industries of the state, a net difference of nearly \$9,700.

It should be noted that employees directly pay only one half of Social Security retirement payroll taxes. The other half is paid for by their employers. The annual amount of Social Security Payroll taxes reported in the CPS survey is for employees only, not employers. The mean size of the social security retirement payroll tax for biopharmaceutical-related workers in Massachusetts was \$4,648. Adding the amount contributed by their employers yields a total payment of \$9,296 towards the Social Security payroll tax. Labor market research indicates that the burden of the employer portion of the Social Security tax is ultimately borne by workers in the form of lower wages.

Table 3:
Mean Annual Amount of Payroll, Federal Income, and
State Income Taxes Paid by Employed Persons (16+) in Biopharmaceutical-Related and
All Industries of Massachusetts, 2004 -2005 Averages

Type of Tax	(A) Biopharmaceutical- Related	(B) All Industries	(C) Biopharmaceutical, All Industries
Social Security Payroll or Federal Government Retirement	\$4,843	\$3,198	\$1,644
State Income	3,334	1,992	1,342
Federal Income	12,843	6,150	6,693
Above Three Taxes Combined	\$21,019	\$11,340	\$9,679

Source: March 2005 and March 2006 CPS Surveys, work experience and income supplements, public use files, tabulations by authors.

On the other side of the fiscal ledger, the mean dollar value of the cash and non-cash transfers received by workers in biopharmaceutical-related industries was quite low both in absolute dollar terms and in comparison to the mean annual value of the transfers received by their employed peers in all industries. In Massachusetts, the estimated annual average cost in 2004 and 2005 to the state and federal government from the payment of cash and non-cash transfers to workers in biopharmaceutical-related industries was only \$862 compared to \$1,404 for workers in all industries, a difference of \$542. (Table 4).

Table 4:
Mean Annual Amount of Cash and In-Kind Transfers Received by Workers (16 and Older) in Biopharmaceutical-Related and All Industries of Massachusetts, 2004 and 2005 Averages

Type of Transfer Income	(A) Biopharmaceutical- Related Industries	(B) All Industries	(C) Biopharmaceutical, All Industries
Cash	\$617	\$902	-\$285
In-Kind (Food stamps, rental subsidies, Medicare/Medicaid)	\$245	\$502	-\$257
Total Transfers	\$862	\$1,404	-\$542

Source: March 2005 and March 2006 CPS Surveys, work experience and income supplements, public use files, tabulations by authors.

Table 5 displays estimates of the net fiscal contributions of workers in biopharmaceutical-related and all other industries in Massachusetts in 2004 and 2005. The net fiscal contribution (taxes paid-transfers received) of workers in biopharmaceutical-related industries of Massachusetts was \$20,157 compared to only \$9,336 for workers in all industries. Thus, the absolute size of the net fiscal contribution of workers in biopharmaceutical-related industries was more than twice as high as that of workers in all industries of the Commonwealth in 2004-2005.

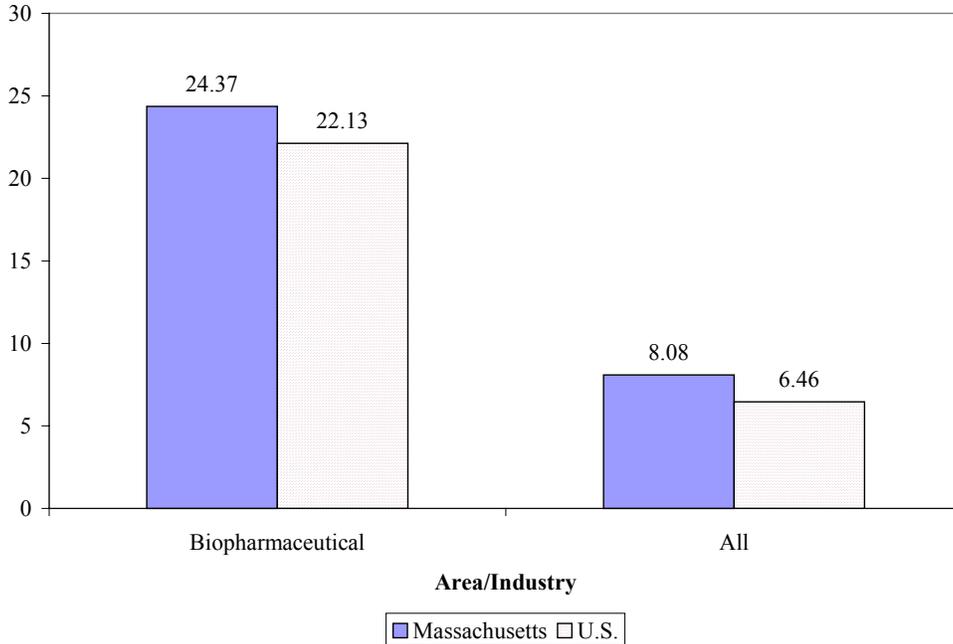
Table 5:
Net Annual Fiscal Contributions of Workers (16+) in Biopharmaceutical-Related and
All Industries of Massachusetts, 2004 and 2005 Averages

Fiscal Measure	(A) Biopharmaceutical- Related	(B) All Industries	(C) Biopharmaceutical All Industries
(a) Taxes Paid	\$21,019	\$11,340	\$9,679
(b) Transfers Received	\$862	\$1,404	-\$542
(c) Net fiscal contribution (a – b)	\$20,157	\$9,936	\$10,221

Source: March 2005 and March 2006 CPS Surveys, work experience and income supplements, public use files, tabulations by authors.

Another way of measuring the fiscal impacts of workers in biopharmaceutical-related industries involves calculating the ratio of mean annual taxes paid to the mean value of cash and in-kind transfers received. Chart 2 displays the ratio of annual average tax payments to cash and in-kind benefits received by workers in biopharmaceutical-related industries and all industries in Massachusetts and the U.S. Those workers employed in biopharmaceutical-related industries of Massachusetts paid \$24.37 in payroll and state/federal income taxes for every dollar they received in cash and in-kind transfers. The comparable ratio for workers in all industries of the state was 8.08, i.e. workers in all industries paid on average \$8.08 in taxes for every dollar of transfers that they received. Clearly, workers in biopharmaceutical-related industries of Massachusetts were substantial net contributors to the fiscal position of state and national governments.

Chart 2:
Mean Ratios of Annual Taxes Paid to Mean Transfers Received by
Employed Workers (16-64) in Biopharmaceutical-Related and
All Industries of Massachusetts and the U.S. 2004-2005 Averages



The findings on the mean annual tax payments of workers in biopharmaceutical-related industries of the state can be combined with our estimates of the number of employed workers in the state to generate estimates of the annual level of payments of Social Security and federal/state income taxes. We have generated such tax payment estimates under two scenarios. Under the first scenario, we include only the Social Security payroll taxes paid directly by the workers. Under the second scenario, we include the portion of Social Security payroll taxes paid by the employers of these workers in biopharmaceutical-related industries of the state.

Under the first scenario, workers in biopharmaceutical-related industries paid nearly \$1.2 billion in taxes and received only \$49 million in cash and in-kind transfer incomes on average during 2004 and 2005. (Table 6). The net fiscal benefits to federal and state government from biopharmaceutical industry workers were \$1.15 billion. Under the second scenario, adding the Social Security taxes paid by employers for their workers yields \$1.46 billion in total taxes paid by workers in biopharmaceutical-related industries of Massachusetts on average during 2004 and 2005. The net fiscal benefit to the federal and state government from workers in

biopharmaceutical-related industries of the state was \$1.15 billion under the first scenario and \$1.41 billion under the second scenario.

Table 6:
Total Taxes Paid by Workers (16+) of Biopharmaceutical and
All Industries of Massachusetts, 2004-2005
(In 1000s)

Tax Type	Biopharmaceutical Industry	All Industry
Federal Income Tax	\$732,591	\$20,952,525
State Income Tax	190,164	6,786,547
Employee Paid Federal Retirement Payroll Tax	11,100	970,001
Social Security Retirement and Medicare Payroll Tax	265,136	9,926,576
Total Transfers	49,194	4,780,671
Scenario I: Total Taxes Paid (Excluding Employer Contributions)	1,198,992	38,635,649
Scenario II: Total Taxes Paid (Including Employer Contributions)	1,464,129	48,562,225
Net Fiscal Benefit Under Scenario I	1,149,798	33,854,978
Net Fiscal Benefit Under Scenario II	1,414,935	43,781,554

Source: March 2005 and March 2006 CPS Surveys, work experience and income supplements, public use files, tabulations by authors.

Home Ownership Rates and Property Tax Payments of Workers in Biopharmaceutical-Related Industries and All Industries, 2005

Workers with higher earnings are more likely to be members of families that own their homes than their peers with lower annual earnings. This pattern also should hold true for workers with higher levels of educational attainment. The combination of higher educational attainment levels and higher annual earnings of workers in biopharmaceutical-related industries in Massachusetts should make them more likely to own their homes. In addition, since the demand for housing has been shown to be fairly income elastic, one would also expect the average values of the homes owned by biopharmaceutical-related industry workers to be higher than those of all workers. These higher valued homes would generate a higher annual stream of property taxes, the major source of financing of local governments in our state.

As expected, in 2005, slightly more than 77 percent of the workers in biopharmaceutical-related industries of Massachusetts owned the homes in which they lived compared to 70.3

percent of workers from all industries in Massachusetts. (Table 7). The home ownership rate of biopharmaceutical-related industry workers in Massachusetts was slightly higher than that of their peers working in the same industries across the U.S. (77% versus 76%).

We also analyzed the home ownership rates of those workers who were the heads of their households in biopharmaceutical-related industries and all industries of Massachusetts and the U.S.⁸ The results show a similar pattern, i.e., home ownership rates of employed householders in biopharmaceutical-related industries were higher than those of employed householders in all industries of the state. (Table 8). The ownership rate gap between workers in biopharmaceutical-related industries and all industries on this measure was 7 percentage points in favor of biopharmaceutical-related industry workers (73.6% versus 66.6%).

Table 7:
Home Ownership Rates of Households in Which the Employed Lived by
Major Industry of Employer in Massachusetts and the U.S., 2005
(in %)

Geographic Area	(A) Biopharmaceutical Industry	(B) All Industries	(C) Biopharmaceutical, All Industries
Massachusetts	77.1	70.3	+6.8 percentage points
U.S.	76.1	70.6	+6.5 percentage points

Source: 2005 American Community Surveys, public use files, tabulations by authors.

Table 8:
Home Ownership Rates of Households of Employed Householders by Major Industry of
Employer in Massachusetts and the U.S., 2005
(in %)

Geographic Area	(A) Biopharmaceutical Industry	(B) All industries	(C) Biopharmaceutical, All Industries
Massachusetts	73.6	66.6	+7.0 percentage points
U.S.	73.7	66.8	+6.9 percentage points

Source: 2005 American Community Surveys, public use files, tabulations by authors.

Workers in biopharmaceutical-related industries in every educational attainment level were more likely to own their home than their peers across all industries of the state. Home

⁸ The “householder” is defined by the U.S. Census Bureau as the person in the household whose name the housing unit is owned or rented.

ownership rates among biopharmaceutical-related industry workers varied only modestly across educational subgroups, ranging from a low of just under 69 percent among workers without high school diplomas to 77 to 78 percent among those workers with bachelor's or higher degree and to a high of 83 percent among workers with a high school diploma. (Table 9). The differentials in home ownership rates for biopharmaceutical workers across educational subgroups compared to workers from all industries ranged from 3 to 18 percentage points in favor of biopharmaceutical-related industry workers.

It might appear to be somewhat puzzling that workers with only a high school diploma in biopharmaceutical industries of Massachusetts were more likely to own their homes than their better educated peers. This finding is due to the fact that a high share of the workers with a bachelor's or higher degree in biopharmaceutical-related industries were foreign-born.⁹ These foreign-born workers accounted for one of every four workers in biopharmaceutical-related industries of Massachusetts. Among all workers with a Bachelor's or higher degree in the biopharmaceutical-related industries of the state, nearly one-third were foreign-born. The median age of these foreign-born workers in biopharmaceutical -related industries with Bachelor's or higher degree was 39, several years below the median age of the native born. The younger ages combined with the temporary visa status of some immigrant worker would make foreign-born workers less likely to own their home.

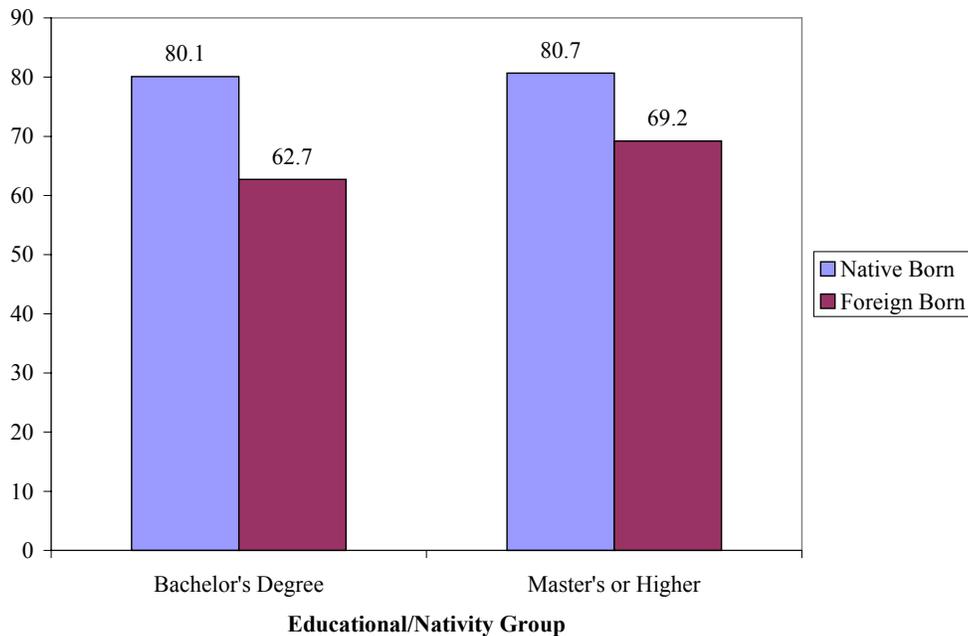
Native-born workers with a Bachelor's or higher degree working in biopharmaceutical-related industries in both Massachusetts and the U.S. were more likely to own their home than their less educated peers. (Chart 3). Slightly more than 80 percent of native-born workers with a Bachelor's degree in biopharmaceutical-related industries owned their homes and 81 percent of those with a Masters or higher degree did so.

⁹ See: Andrew Sum and Ishwar Khatiwada with Sheila Palma, A Profile of Demographic, Socioeconomic, and Job Characteristics of the Employed in Biopharmaceutical-Related and All Industries of Massachusetts and the U.S., PhRMA Research Paper No. 11, Center for Labor Market Studies, Northeastern University, Prepared for Pharmaceutical Research and Manufacturers of America (PhRMA), May 2007.

Table 9:
Home Ownership Rates of Employed Persons 16 and Older in Biopharmaceutical-Related Industries and All Industries of Massachusetts by Educational Attainment, 2005

	(A)	(B)	(C)
Educational Attainment	Biopharmaceutical-Related	All industries	Biopharmaceutical, All
< 12 or 12, no diploma	68.8	55.4	+13.4
H.S. diploma / GED	83.0	64.8	+18.2
13-15 years	71.6	72.5	-.9
Bachelor's degree	77.6	74.2	+3.4
Master's or higher	77.0	79.1	-2.1

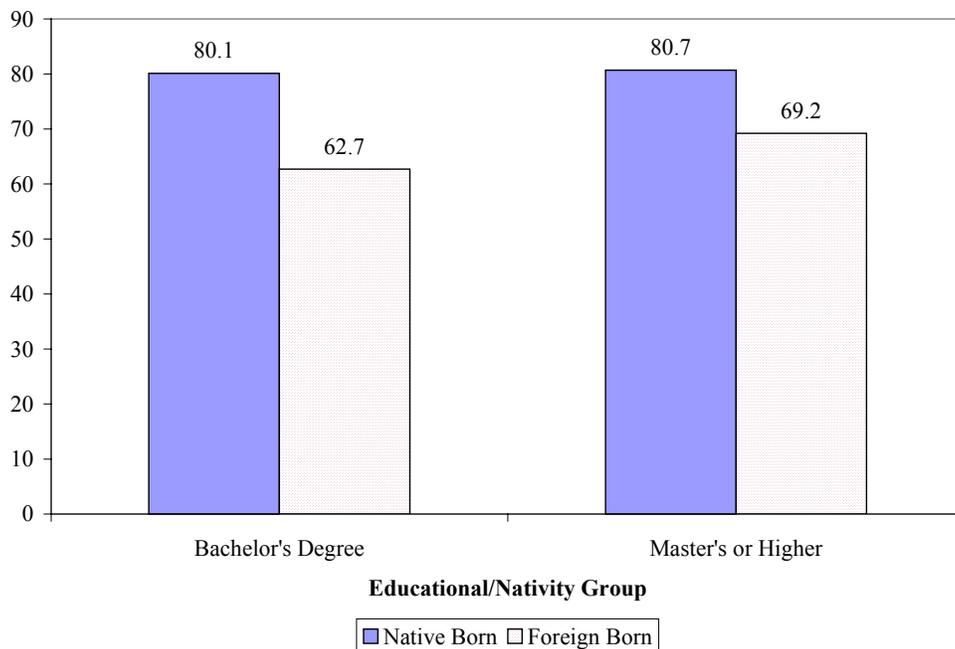
Chart 2:
Home Ownership Rates of Employed Persons in Biopharmaceutical-Related Industries of Massachusetts in Selected Educational/Nativity Subgroups, 2005



Workers in biopharmaceutical-related industries not only had a higher home ownership rate, but the median value of their homes also was higher than that of workers in all industries. This held true for both Massachusetts and the U.S. In 2005, the median value of the homes of biopharmaceutical-related industry workers in Massachusetts was \$439,207, which was more

than \$65,000 higher than the median value of homes of all workers.¹⁰ Massachusetts' biopharmaceutical-related industry workers median home value was nearly \$175,000 higher than their peers across the nation working in the same industries. The difference between the median value the homes of workers in biopharmaceutical industries and all industries in the U.S. was more than \$83,000 in favor of biopharmaceutical-related industry workers. As will be revealed in the following section, these higher property values translate to higher property taxes for the local governments of the state.

Chart 3:
Median Value of Home of Workers in Biopharmaceutical-Related Industries and All Industries of Massachusetts and the U.S., 2005



As noted earlier, local governments of Massachusetts are heavily dependent on property taxes to finance their activities. The higher home ownership rates of workers in biopharmaceutical-related industries also were accompanied by higher property values, and they paid more in property taxes. The estimated median value of property taxes paid by biopharmaceutical-related workers in Massachusetts in 2005 was \$3,565, which was \$547 or 15% higher than the median value of the property taxes paid by workers in all industries of the

¹⁰ The U.S. Census Bureau collected data on values of homes in a categorical format rather than continuous variable. For this reason, we can only estimate the median value of homes rather than their mean value.

state who owned their homes. (Table 10). This pattern of higher median property taxes for workers in biopharmaceutical-related industries held true for the entire nation. Table 11 displays the expected value of annual property taxes of workers in biopharmaceutical-related industries and all industries of Massachusetts in 2005.¹¹ The expected value of annual property taxes of workers in biopharmaceutical-related industries was \$2,622 in Massachusetts. This expected annual value of property taxes paid by workers in biopharmaceutical-related industries was \$607 higher than the expected annual property tax payments of workers employed in all industries of Massachusetts.

Table 10:
Median Value of Annual Property Taxes Paid by Employed Homeowners in
Massachusetts and the U.S. by Major Industry of Employer, 2005

Geographic Area	(A) Biopharmaceutical Industry	(B) All industries	(C) Biopharmaceutical, All Industries
Massachusetts	\$3,563	\$3,026	\$547
U.S.	\$2,500	\$1,847	\$653

Source: 2005 American Community Surveys, public use files, tabulations by authors.

Table 11:
Estimated Expected Annual Values of Property Tax Payments by
Employed Homeowners in Massachusetts by Major Industry of Employers, 2005

Variable	(A) Biopharmaceutical- Related	(B) All Industries	(C) Biopharmaceutical, All Industries
Homeownership Rate	73.6%	66.6%	+7 percentage points
Median Value of Property Tax	\$3,563	\$3,026	\$547
Expected Value of Annual Property Tax	\$2,622	\$2,015	\$607

Source: 2005 American Community Surveys, public use files, tabulations by authors.

¹¹ The expected value of property tax payments is derived by multiplying the home ownership rate by the median value of property taxes paid by homeowners.

The Health Insurance Coverage Rates and Medicaid, Medicare Coverage Rates of Employed Persons in Biopharmaceutical-Related Industries and All Industries of Massachusetts

The absence of health insurance coverage from one's employer can place workers at risk of lacking any type of health insurance coverage or being dependent on subsidized health care from the Medicaid or Medicare system. Low skilled and other workers lacking health insurance coverage from their employers and from other family members' plans often rely on emergency room treatment for their health care needs, thereby shifting costs onto either taxpayers or those persons with health insurance coverage by raising the costs of their premiums.¹²

The March CPS surveys contain a supplementary set of questions on the health insurance coverage of household members, the sources of their health insurance coverage, and their self-reported health status. The findings of the March 2005 and March 2006 CPS surveys were analyzed to identify the health insurance coverage, sources of coverage, and the self-reported health status of workers in biopharmaceutical-related industries and all industries of the state and the nation in 2004 and 2005. It should be noted that the findings in this section pertain to the situation in Massachusetts prior to the full implementation of the newly enacted state legislation that requires workers and non-workers to obtain some type of health insurance coverage.

In 2004 and 2005, the vast majority (99%) of employed persons in biopharmaceutical-related industries of Massachusetts had some type of health insurance coverage while 15 percent of all workers in the state reported that they lacked any type of health coverage, including Medicaid or Medicare. In the U.S., workers in biopharmaceutical-related industries were only half as likely as their employed peers in other industries to report not having any type of health insurance coverage (9% versus 19%). (Table 12).

¹² Employer costs of health insurance for their workers are largely shifted back on to their employees through lower wages. For evidence on this issue, see Katherine Baicker and Amitabh Chandra, "The Labor Market Effects of Rising Health Insurance Premiums", Journal of Labor Economics, Volume 24, Number 3, July 2006, pp. 609-634.

Table 12:
Percent of Employed Persons (16+) in Biopharmaceutical-Related and
All Industries of Massachusetts and the U.S. Who Did Not Have Any Health Insurance
Coverage, 2004-2005 Averages

	(A)	(B)	(C)
Geographic Area	Biopharmaceutical- Related	All industries	Biopharmaceutical, All
Massachusetts	1.5	14.7	.10
U.S.	8.8	19.1	.47

Source: March 2005 and March 2006 CPS Surveys, work experience and income supplements, public use files, tabulations by authors.

The bulk of workers in the state’s biopharmaceutical-related industries identified health insurance plans at work as the primary source of their coverage.¹³ Nearly 70 percent of the workers in these industries cited such employer based health insurance plans versus only 52 percent for all workers in the Commonwealth, a difference of 18 percentage points. (Table 13). Even larger differences in employer-financed coverage existed between biopharmaceutical industry workers and all workers in the nation in 2004-2005.

Table 13:
Percent of Employed Persons (16+) in Biopharmaceutical-Related and All Industries of
Massachusetts and the U.S. with Employer Financed Health Insurance, 2004-2005 Averages

	(A)	(B)
Industry	Massachusetts	U.S.
Biopharmaceutical-Related	69.8	75.3
All Industries	51.8	52.8
Biopharmaceutical, All Industries	+18.0	+22.5

Source: March 2005 and March 2006 CPS Surveys, work experience and income supplements, public use files, tabulations by authors.

Only 7 percent of employed persons in the state’s biopharmaceutical industries reported that they obtained health insurance coverage from the Medicaid or Medicare system. This share was 2.1 percentage points below the share of all workers in the state who obtained their health insurance coverage from the Medicaid or Medicare systems. Similar sized differences in

¹³ These plans were at least partly financed by their employers. The exact financing arrangements were not identified.

dependence on Medicaid/Medicare coverage prevailed at the national level. The reduced dependence of biopharmaceutical-industry workers on government subsidized health care helped lower the average in-kind transfer costs of these workers both in Massachusetts and the nation at large in 2004-2005. (Table 14).

Table 14:
Percent of Employed Persons (16+) in Biopharmaceutical-Related and
All Industries of Massachusetts and the U.S. Who Were Dependent on Medicaid or Medicare for
their Health Insurance Coverage, 2004-2005 Averages

Geographic Area	(A) Biopharmaceutical- Related	(B) All Industries	(C) Biopharmaceutical, All
Massachusetts	6.9	9.0	-2.1
U.S.	3.9	6.9	-3.0

Source: March 2005 and March 2006 CPS Surveys, public use files, tabulations by authors.

Findings of the March 2005 CPS survey revealed that biopharmaceutical industry workers in both Massachusetts and the U.S. were more likely than their employed peers in other industries to report themselves in “excellent” or “very good” health. (Table 15). In Massachusetts, 82 percent of biopharmaceutical industry workers rated their health status as excellent or good versus 75 percent of all employed persons in the state, a difference of 7 percentage points. In the U.S., slightly over 76 percent of the workers in the nation’s biopharmaceutical industries rated their personal health as excellent or good versus slightly under 70 percent of all of the employed in the nation in March 2005. Workers in excellent or very good health are less likely to be intensive users of the health care system, thereby imposing fewer resource costs on society as a whole. The better personal health of biopharmaceutical-industry workers may not be attributable at all to their attachment to this industry, but it is likely that their better health does rebound to the benefit of the rest of the society by reducing demands on the health care system.

Table 15:
Self-Reported Health Assessments of Workers in Biopharmaceutical-Related and
All Industries of Massachusetts and the U.S., March 2005

Geographic Area	Excellent/Very Good	Good/Fair	Poor
Massachusetts			
Biopharmaceutical Industries	82.0	18.0	--
All Industries	75.4	24.2	0.3
United States			
Biopharmaceutical Industries	76.5	23.0	0.5
All Industries	69.6	29.6	0.8

Source: March 2005 CPS surveys, public use files, tabulations by authors.