

Go Higher: The Earnings Outcomes of Public Postsecondary Education in Massachusetts Commentary Technical Supplement

Methodology on Analysis of Massachusetts Public Higher Education Earnings Data

Introduction

In recent years, the Massachusetts Department of Higher Education (DHE) has prioritized leveraging enhancements to our Commonwealth's statewide longitudinal data systems, including tracking earnings outcomes associated with postsecondary education program participation. In parallel, the Massachusetts Board of Higher Education ("BHE" or "the Board") has approved two post-enrollment earnings metrics ([December 2018; BHE 19-02](#)) for inclusion in the Commonwealth's public Performance Measurement Reporting System (PMRS) and recently endorsed an Economic Mobility Priority ([January 2025; BHE 25-29](#)) to better measure and positively impact economic outcomes of individuals associated with postsecondary education program participation in Massachusetts.

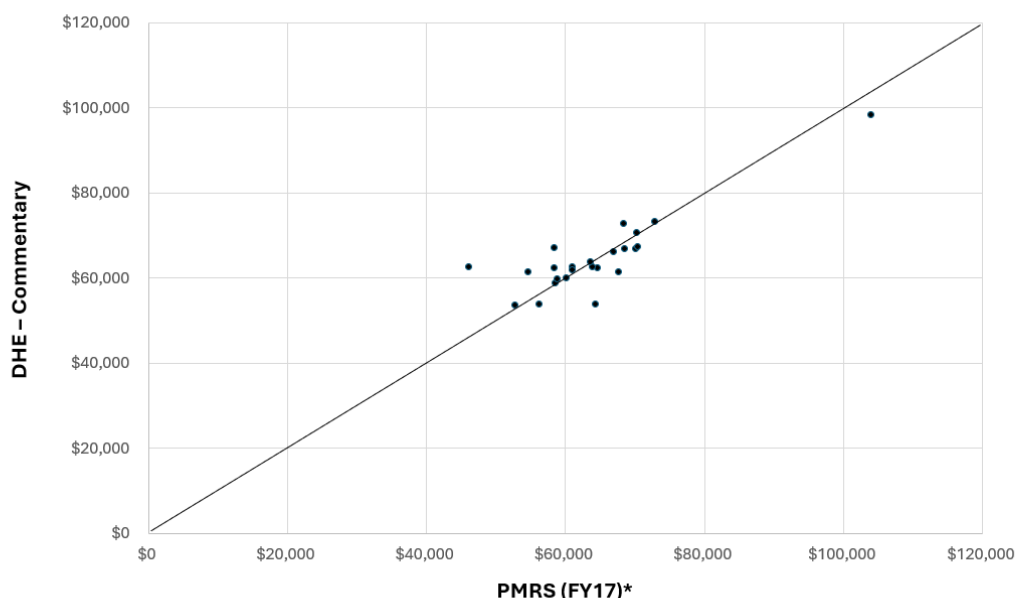
Accordingly, DHE has integrated earnings outcomes of Massachusetts public college and university students into our latest [public-facing PMRS update](#) and, in coordination with the BHE, completed a broader set of earnings analyses presented in an associated [Commentary](#) (released in November 2025) that draws on a wider cross-section of the dataset used for the PMRS metrics. This document serves as a technical supplement to that Commentary.

The Commentary and PMRS have related, but slightly differing goals, with PMRS establishing a long-term per-institution measurement, and the Commentary serving as a way to identify statewide trends, requiring larger "n" sizes. This document describes the methods and limitations in the Commentary, in particular, to highlight differences between data in the Commentary and data shared in PMRS.

DHE Earnings Data Sources

In just about all cases, the methodology of the Commentary analysis mirrors the [PMRS earnings outcomes metrics methodology](#). That (PMRS) methodology was developed in consultation with the DHE's Data Council which consists of institutional research leads from each Massachusetts public college and university and was reviewed by the DHE Data Governance Steering Committee and advisory committee composed of provosts and vice presidents representing from all three public college and university segments. Adjustment to the methodology and benchmarking were made in collaboration with the Data Council after early drafts of PMRS earnings outcomes were shared.

Median Earnings – All IHEs except UMass: DHE Commentary vs PMRS (FY17)



Note: DHE earnings are inflation-adjusted to 2023 dollars; displaying data for graduates from 2014-2018. *Weighted average of immediate enrollee outcomes and adult learner outcomes (graduates only).

The data informing PMRS and the Earnings Commentary was drawn from two primary sources:

- The Department of Unemployment Assistance (DUA): Includes wage record information on prior students/graduates found to be covered by Massachusetts unemployment insurance, including industry of employment and quarterly gross earnings
- The Higher Education Information Resource System (HEIRS): DHE's centralized postsecondary education data warehouse that includes student-level data on enrollment, course outcomes, awards conferred, and more

Under a data sharing agreement between the Massachusetts education and labor and workforce development agencies, DHE obtained from DUA the earnings records from 2010 onward for individuals who enrolled in a Massachusetts public institution of higher education using a secure matching process that provided anonymized records back to DHE. This match serves as the foundation for a longitudinal panel used for the analyses included in both PMRS and the Commentary.

Separately, in addition, DHE also leveraged the Census American Community Survey (ACS) 5-Year Estimates Public Use Microdata Sample (PUMS) and Connecticut's EdSight dashboard for select benchmarks leveraged within the Commentary.

PMRS vs Commentary Methodologies

Although very similar, there are three notable differences between the PMRS and Commentary methodologies:

1. The Commentary analysis uses a broader sample of former Massachusetts public higher education students than PMRS. This differs from PMRS which, as an accountability report showing whether institutions are meeting specific benchmarks, uses more narrowly defined cohorts. DHE's analyses includes: (1) those who enroll in postsecondary pathways immediately after graduating from a Massachusetts public high school, and (2) those who enroll as MA residents age 25 and older as first-time, transfer, or readmitted students. Unlike PMRS, the Commentary makes use of all three groups, including (number 3) those who enroll prior to age 25 but not immediately after high school graduation (i.e. those enrolling between approximately 19 years of age and 25) and those who enroll initially as non-degree-seeking students.
2. The Commentary analysis aggregates multiple exiting cohorts – exit years between Fiscal Year 2014 and Fiscal Year 2018, as compared to single year-by-year only reporting in PMRS – to enable sufficient “n size” for secondary analyses included in the Commentary. Without this degree of aggregation, there would be limited “n sizes” to evaluate select outcomes by smaller subsets such as academic program and race/ethnicity.
3. The Commentary integrates University of Massachusetts (“UMass”) student data to enable a more comprehensive view by segment and by institution. UMass is not included within PMRS's scope as defined in statute; UMass conducts its own accountability reporting (and other similar reporting) separately.

Also, of note, the Commentary sample includes students who initially enrolled in fall 2012 or later. This is aligned with the age 25 plus PMRS metric but differs from the direct-from-high-school metric which also includes students who initially enrolled in fall 2010 and 2011.

The Commentary's methodology and work was shared with a series of outside academics prior to the release.

What outcome years are reported?

In the Commentary, outcomes are reported by the fiscal year in which each student graduated or exited and by degree level. The median of annual earnings available in the dataset is reported for these points in time after graduation or exit:

- Year 1
- Year 3
- Year 5
- Year 10 (to be reported at a future date as future earnings data becomes available)

Individuals may move into groups excluded from reporting at any time after their graduation or exit from their initial institution. When this occurs, those individuals' earnings outcomes are excluded from reporting, beginning at the point of transition into an excluded group. For example, an individual whose outcome meets the definition of “graduated from initial

institution with credential” in Years 1 and 3 will be included in the median earnings calculation for those years. However, if that individual then earns another credential between Years 3 and 5, they will be excluded from the Year 5 median earnings calculation. Only the earning of the credential – not merely pursuing it – leads to exclusion (so long as the other requisite criteria for inclusion are met).

Whose outcomes are measured?

Neither PMRS’s analyses nor the Commentary’s analyses cover all graduates of all public institutions in Massachusetts. This is due to three primary factors, though others also play a role:

- Only included are degree recipients who in the case of bachelor’s students earn their credential within 6 years and in the case of associate degree students earn their credential within 4 years of initial enrollment. The former has its basis in the 1990 Student Right to Know Act, which has guided national reporting across many leading sources; the latter provides a similar view (two years out from the “expected” degree completion timeline) for associate degrees.
- The DUA earnings data to which DHE has access does not include self-employed individuals, military personnel, federal government workers, or persons employed out of state.
- The DUA earnings data source does not include hours worked; as a result, DHE makes use of a proxy measure for hours worked based on a minimum wage threshold for full-time workers to ensure consistency for comparisons and therefore does not include those estimated to be part-time employed.

The samples of focus for bachelor’s degrees and associate degrees are described as follows:

Bachelor’s degrees: The Commentary analyzes point-in-time earnings outcomes of all bachelor’s degree recipients from state universities and UMass campuses who entered in a fall term and earned a degree between Fiscal Year 2014 and Fiscal Year 2018, for whom earnings data was available via DUA and whose annual earnings met the threshold of full-time employment (more details included on Page 12 [here](#)). Bachelor’s degree recipients who later earned another credential (within the first 5 years after graduation) are excluded from reporting after that time, as the bachelor’s degree would no longer represent the most relevant association with the earnings outcomes to follow.

Further details on our sample development process are included as follows:

Cohort	Total count	Notes
New undergraduate entrants at Massachusetts 4-year colleges	133,792 <i>Fall 2010: 26,443 14,400 (UMass) 12,043 (State U’s)</i>	<ul style="list-style-type: none"> • Sourced from DHE’s Tableau Server (internal), Fall Enrollment data source, filtered to new student types (first-time, transfer,

(Fall 2010 – Fall 2014)	<p><i>Fall 2011: 26,918 14,865 (UMass) 12,053 (State U's)</i></p> <p><i>Fall 2012: 26,673 14,666 (UMass) 12,007 (State U's)</i></p> <p><i>Fall 2013: 26,816 14,721 (UMass) 12,095 (State U's)</i></p> <p><i>Fall 2014: 26,942 15,046 (UMass) 11,896 (State U's)</i></p>	<p>readmitted/reactivated, non-degree, seeking another degree at same level)</p> <ul style="list-style-type: none"> • Counts include headcount of undergraduate students enrolled for credit each fall • Counts do not exclude those pursuing only certificates
Total bachelor's degrees conferred (FY14-18)	<p>104,420</p> <p><i>FY14: 19,727 FY15: 20,375 FY16: 20,886 FY17: 21,529 FY18: 21,903</i></p>	<ul style="list-style-type: none"> • Excludes all who did not receive a bachelor's degree • Not degree recipients are matched in the DUA-DHE database; more details included in the text below
Total bachelor's degree completers in our earnings dataset	<p>50,545</p> <p><i>FY14: 1,301 FY15: 3,870 FY16: 12,221 FY17: 16,020 FY18: 17,133</i></p>	<ul style="list-style-type: none"> • Excludes those who initially enrolled prior to fall 2012 • Excludes those who did not complete within 6 years after entry • Excludes those who had a prior degree • Excludes those who are employed out of state: Estimated ~10% • Excludes those who are self-employed: Estimated ~5% • Excludes anyone without a social security number on record as DUA does not do match without it: Estimated at ~5% • Excludes those who are unemployed: Estimated 2-3%

		<ul style="list-style-type: none"> Excludes those who are federal government employees / military: Estimated ~1%
Total bachelor's degree completers working full-time, year-round as of Year 5	25,213 FY14: 625 FY15: 1,893 FY16: 6,070 FY17: 7,950 FY18: 8,675	<ul style="list-style-type: none"> Excludes those who do not meet full-time year-round employment proxy
Total "terminal" bachelor's degree completers working full-time, year-round as of Year 5	21,278 FY14: 526 FY15: 1,577 FY16: 5,085 FY17: 6,715 FY18: 7,375	<ul style="list-style-type: none"> Excludes those who later earned another credential Note: An individual whose outcome meets the definition of graduated from initial institution with credential in Years 1 and 3 will be included in the median earnings calculation for those years. However, if that individual then earns another credential between Years 3 and 5, they will be excluded from the Year 5 median earnings calculation

IHE Totals: State Universities / UMass -- Note: Sorted alphabetically.

IHE	New undergraduate entrants (Fall 2010-Fall 2014)	Total bachelor's completers (FY14-FY18)	Sample Size
Bridgewater	12,951	9,900	1,870
Fitchburg	5,849	3,996	1,003
Framingham	7,309	4,597	1,162
Mass Maritime	1,785	1,534	245
MassArt	3,795	1,786	263
MCLA	2,697	1,811	256
Salem	10,545	8,030	1,975
UMass-Amherst	32,399	29,642	5,927
UMass-Boston	15,317	12,573	1,806
UMass-Dartmouth	11,160	6,772	1,624
UMass-Lowell	14,822	12,311	2,786
Westfield	8,110	6,188	1,278
Worcester	7,053	5,280	1,083
Total	133,792	104,420	21,278

Associate degrees: The Commentary analyzes point-in-time earnings outcomes of all associate degree recipients from community colleges who entered in a fall term and earned a degree between Fiscal Year 2014 and Fiscal Year 2018 for whom earnings data was available via DUA and whose annual earnings met the threshold of full-time employment (more details included on Page 12 [here](#)). Associate degree recipients who later earned another credential (within the first 5 years after graduation) are excluded from reporting after that time, as the associate degree would no longer represent the most relevant association with the earnings outcomes to follow. Additionally, associate degree recipients from UMass-Amherst and UMass-Lowell are not included in the final sample to maintain a focus on those earning degrees at community colleges.

Further details on our sample development process are included as follows:

Cohort	Total count	Notes
New undergraduate entrants at Massachusetts community colleges (Fall 2010 – Fall 2014)	188,309 <i>Fall 2010: 39,652</i> <i>Fall 2011: 38,937</i> <i>Fall 2012: 38,450</i> <i>Fall 2013: 36,508</i> <i>Fall 2014: 34,762</i>	<ul style="list-style-type: none"> • Sourced from DHE’s Tableau Server (internal), Fall Enrollment data source, filtered to new student types (first-time, transfer, readmitted / reactivated, non-degree, seeking another degree at same level) • Counts include headcount of undergraduate students enrolled for credit each fall • Counts do not exclude those pursuing only certificates
Total associate degrees conferred (FY14-18)	55,657 <i>FY14: 11,340</i> <i>FY15: 11,517</i> <i>FY16: 11,317</i> <i>FY17: 11,067</i> <i>FY18: 10,416</i>	<ul style="list-style-type: none"> • Excludes all who did not receive an associate degree • Not all of these degree recipients are matched in the DUA-DHE database; more details included in the text below
Total associate degree completers in our earnings dataset	23,547 <i>FY14: 1,937</i> <i>FY15: 4,321</i> <i>FY16: 5,999</i> <i>FY17: 5,886</i> <i>FY18: 5,404</i>	<ul style="list-style-type: none"> • Excludes those who initially enrolled prior to fall 2012 • Excludes those who did not complete within 4 years after entry • Excludes those who had a prior degree • Excludes those who are employed out of state: Estimated ~10%

		<ul style="list-style-type: none"> Excludes those who are self-employed: Estimated ~5% Excludes anyone without a social security number on record as DUA does not do match without it: Estimated at ~5% Excludes those who are unemployed: Estimated 2-3% Excludes those who are federal government employees / military: Estimated ~1%
Total associate degree completers working full-time, year-round as of Year 5	10,741 <i>FY14: 1,017</i> <i>FY15: 2,050</i> <i>FY16: 2,588</i> <i>FY17: 2,600</i> <i>FY18: 2,486</i>	<ul style="list-style-type: none"> Excludes those who do not meet full-time year-round employment proxy
Total “terminal” associate degree completers in our earnings dataset as of Year 5	5,743 <i>FY14: 589</i> <i>FY15: 1,104</i> <i>FY16: 1,384</i> <i>FY17: 1,375</i> <i>FY18: 1,291</i>	<ul style="list-style-type: none"> Excludes those who later earned another credential Note: An individual whose outcome meets the definition of graduated from initial institution with credential in Years 1 and 3 will be included in the median earnings calculation for those years. However, if that individual then earns another credential between Years 3 and 5, they will be excluded from the Year 5 median earnings calculation

IHE Totals: Community Colleges -- *Note: Sorted alphabetically.*

IHE	New undergraduate entrants (Fall 2010-Fall 2014)	Total associate completers (FY14-FY18)	Sample Size
Berkshire	5,456	1,264	230
Bristol	16,774	6,085	496
Bunker Hill	23,286	5,956	395
Cape Cod	8,732	2,308	452
Greenfield	4,686	1,318	123
Holyoke	15,819	4,284	494

Massasoit	14,076	4,536	510
MassBay	9,980	2,436	184
Middlesex	17,589	5,759	467
Mt. Wachusett	9,077	2,760	271
North Shore	12,470	4,485	623
Northern Essex	16,417	3,406	352
Quinsigamond	14,512	5,092	352
Roxbury	5,190	1,438	115
STCC	14,245	4,530	679
Total	188,309	55,657	5,743

How do our methodology and findings compare with other sources?

As we conducted our analyses, we examined approaches and findings from other sources to further contextualize our own. A summary of similarities and differences in datasets and methodologies appears below as do the results of those alternative approaches as compared to earnings data analyzed in our Commentary.

Explanation of Methodological Similarities / Differences with Other Approaches

Source	Similarities	Differences
College Scorecard	<ul style="list-style-type: none"> Shows median annual earnings Includes only those who were working as of the measurement point (similar to DHE approach at a high level, though the specifics differ meaningfully) 	<ul style="list-style-type: none"> Focuses only on individuals who received federal student aid Includes those who attend MA institutions and later work out-of-state Focuses on those who began college at the institution 10 years ago Does not account for completion status (i.e., aggregates earnings outcomes of graduates and “stop outs”) Individuals who complete multiple awards are measured multiple times if the awards were completed in different four-digit CIP (program of study) codes and/or credential

		<p>levels, or at different institutions</p> <ul style="list-style-type: none"> • Does not include those who were enrolled in school as of the measurement point (anyone with an in-school deferment for at least 30 days during the measurement year were considered enrolled in school and were excluded from the median earnings calculation) • Earnings were measured based on wages and deferred compensation reported via IRS form W-2 plus positive self-employment earnings reported via Schedule SE • Earnings are inflation adjusted to 2022 (vs 2023) • Individuals with \$1 or more of earnings were considered to be working and are included in the median earnings calculation • Given there is no completion filter, and given working status is set to \$1 or above (rather than a full-time, year-round minimum wage threshold), overall earnings are generally lower than the values shown in our earnings outcomes • Differences between institutions are reduced
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		compared to DHE noted differences, in part, due to the lower overall median earnings
Post-Secondary Employment Outcomes Explorer (PSEO)	<ul style="list-style-type: none"> • Shows median annual earnings • Similar to DHE approach, only graduates who earn at least the annual equivalent of full-time work at the prevailing federal minimum wage and work three or more quarters in a calendar year are included • PSEO goes beyond showing the earnings of students who receive federal financial aid to reflect earnings of the broader population • PSEO uses year of college graduation to set the time horizon for earnings reporting, with metrics shown at 1, 5, and 10 years (where data permits) 	<ul style="list-style-type: none"> • Statistics are generated by matching university transcript data with a national database of jobs • DHE cohort focus (2014-18 graduates) differs from available data in PSEO (2013-15 is the latest available for 5-year bachelor's outcomes; 2011-15 for associate) • Includes those who attend MA institutions and later work out-of-state • PSEO considers students who earn multiple degrees in the system to be separate observations • Students who double-major are counted as two separate observations, as long as the 6-digit CIP (program of study) codes are different • Earnings are inflation adjusted to 2022 (vs 2023)
Carnegie Classifications	<ul style="list-style-type: none"> • Shows median annual earnings • Includes only those who were working as of the measurement point (similar to our approach at a high level, though the specifics differ meaningfully) 	<ul style="list-style-type: none"> • Earnings data are from College Scorecard • Includes those who attend MA institutions and later work out-of-state • Reflect the median earnings value eight years after entry • Focus on Title IV federal financial aid recipient students only

		<ul style="list-style-type: none"> • Students who were enrolled in school, had died, or who did not report any income data were not included • A student who attends multiple institutions can be included in the median earnings calculations for each institution • Given there is no completion filter, and given only eight years elapse after high school graduation, overall earnings are generally lower than the values shown in DHE earnings outcomes • Differences between institutions are reduced compared to our differences, in part, due to the lower overall median earnings
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Median Earnings – State Universities / UMass -- Note: Sorted alphabetically.

IHE	DHE Commentary (Year 5)	College Scorecard	PSEO	Carnegie
Bridgewater	\$62,311	\$57,466	\$59,920	\$50,191
Fitchburg	\$67,034	\$53,874	\$61,361	\$53,950
Framingham	\$66,272	\$52,349	\$59,682	\$49,378
Mass Maritime	\$98,418	\$82,392	\$99,295	\$99,847
MassArt	\$62,464	\$43,582	\$52,143	\$38,459
MCLA	\$53,627	\$48,102	\$49,042	\$45,267
Salem	\$67,034	\$56,662	\$62,465	\$54,540
UMass-Amherst	\$80,441	\$71,631	\$71,686	\$66,904
UMass-Boston	\$74,042	\$65,865	\$70,198	\$64,922
UMass-Dartmouth	\$72,976	\$68,804	\$68,937	\$59,968
UMass-Lowell	\$81,050	\$64,874	\$75,872	\$64,695
Westfield	\$62,768	\$57,346	\$59,024	\$51,731
Worcester	\$70,691	\$60,624	\$63,386	\$53,751

Median Earnings – Public Community Colleges -- Note: Sorted alphabetically.

IHE	DHE Commentary (Year 5)	College Scorecard	PSEO	Carnegie
Berkshire	\$72,824	\$38,832	\$52,045	\$35,877
Bristol	\$53,932	\$38,663	\$47,685	\$34,395
Bunker Hill	\$73,433	\$47,618	\$59,817	\$45,843
Cape Cod	\$67,339	\$43,670	\$52,226	\$37,551
Greenfield	\$62,768	\$37,132	\$49,421	\$35,403
Holyoke	\$53,932	\$37,277	\$47,595	\$35,578
Massasoit	\$60,026	\$46,111	\$55,431	\$44,680
MassBay	\$63,835	\$52,654	\$59,673	\$42,595
Middlesex	\$62,768	\$50,651	\$57,663	\$45,369
Mt. Wachusett	\$61,550	\$41,118	\$55,031	\$38,341
North Shore	\$61,854	\$45,391	\$55,008	\$43,774
Northern Essex	\$67,187	\$42,862	\$52,049	\$39,480
Quinsigamond	\$61,550	\$45,949	\$55,448	\$43,873
Roxbury	\$58,807	\$38,773	\$54,637	\$42,185
STCC	\$59,721	\$36,966	\$56,923	\$35,265

Though this technical supplement includes institution of higher education-specific details, it is important to acknowledge there are many potential drivers of the corresponding earnings differences across segments and institutions. These differences may be borne of methods of measurement or as noted in the Commentary, by differences program mix, geographic region served, and selection. Any comparisons made between segments or institutions should take into account these considerations.