

# 2020 Vision of New England Demographic Change: The Perfect Demographic Storms I-III

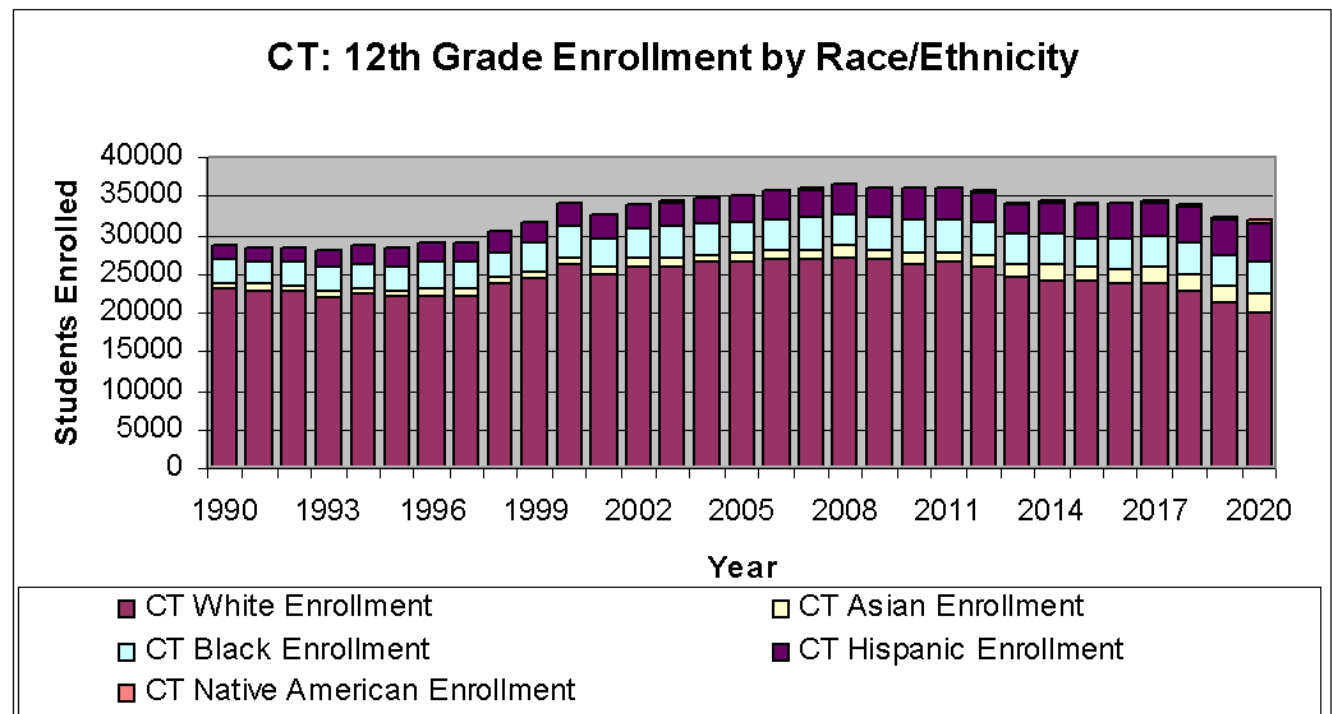
This storm, like that of the recent movie, was caused by:

- Younger minority population
- Higher Hispanic fertility rate
- Higher minority migration rates

Resulting in:

- Higher natural increases in minority population
- Higher migrations of minority persons

If existing rates perpetuate themselves, we will obtain:

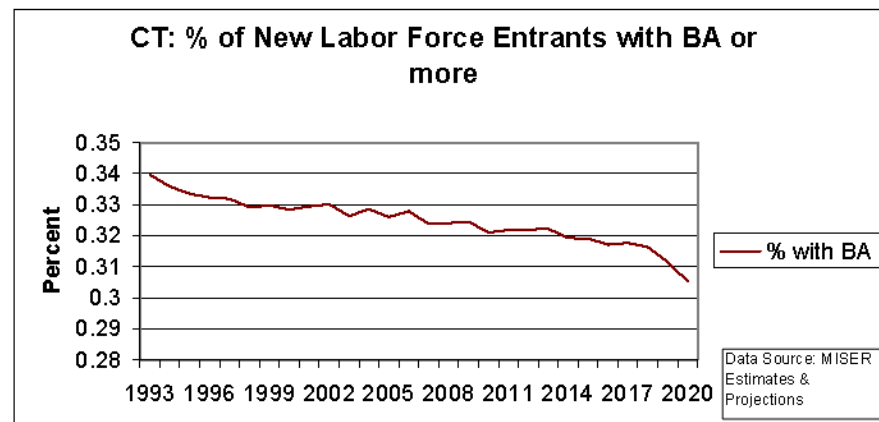
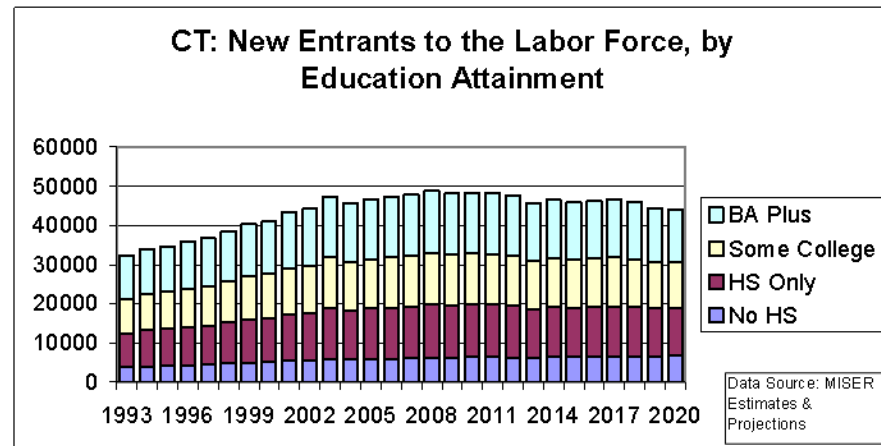


# 2020 Vision of New England Demographic Change: The Perfect Demographic Storm IV

There will be a clear labor force problem in CT by 2020:

Adding to the first three forces, a fourth:

- Historically lower minority educational attainment rates by race and ethnicity



## CT First Steps is the 1<sup>st</sup> Study of its Kind

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1. Following the Entire Group of 1996 Sophomore CAPT-taking Students through the Five Years After High School, through 2003
2. Using Administrative Records, from:
  - a. CAPT exams
  - b. College Board SATs, and student demographic profiles
  - c. National Student Clearinghouse records of enrollment and graduation, and
  - d. For a subset of approximately 15.8% of the cohort who enrolled at a CSU institution, transcript information on remediation, course taking, and grades
3. Evaluating:
  - a. The effectiveness of high school testing in predicting student's later success
  - b. The choices students from CT make in attending college, and
  - c. The potential policy implications for the State

There are only two conclusions—

## Conclusion #1: CAPT and SAT are quite different exams

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1. Correlations between CAPT and SAT are quite small
2. There are huge overlaps in the distributions of the two exams, measured by
  - a. The Joint Distribution of the exam scores
  - b. The Distribution of SAT by CAPT score band
3. SAT and CAPT show different abilities to predict future success beyond high school, sometimes CAPT predicting better than SAT; sometimes SAT, better than CAPT; and sometimes they are independently useful in predicting specific outcomes
4. Therefore, it should not be a question of whether one exam should replace the other or vice versa. More information is better than less. CAPT and SAT provide independently useful information. More study should be given to which exam should be used for different purposes

# 1. Small Correlations between CAPT and SAT

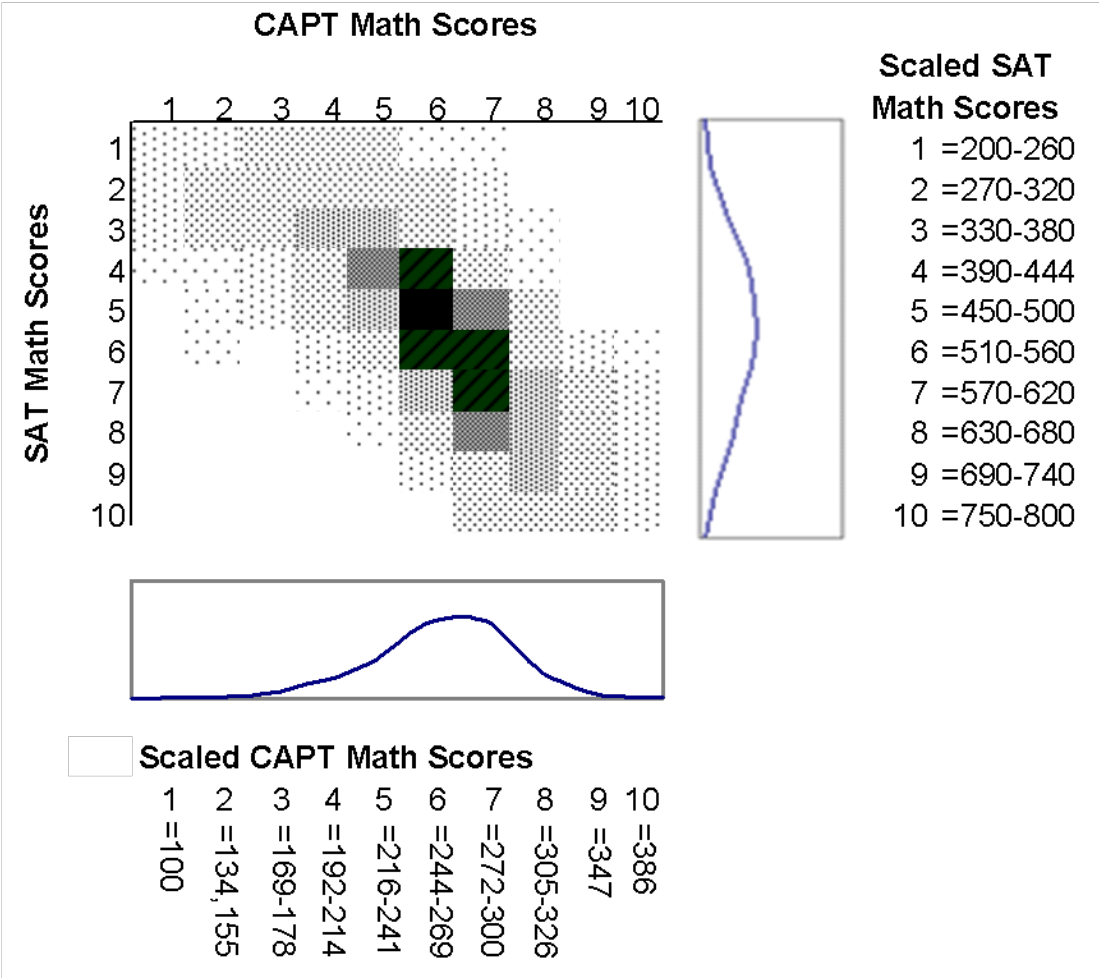
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- Correlations among common elements of the two tests, CAPT and SAT, for the cohort studied are as follows:

|           | CAPT_lit | CAPT_edit | CAPT_math | SAT_v | SAT_m |
|-----------|----------|-----------|-----------|-------|-------|
| CAPT_lit  |          | .49       |           | .35   |       |
| CAPT_edit |          |           |           | .49   |       |
| CAPT_math |          |           |           |       | .78   |

# 2. Overlaps between CAPT and SAT

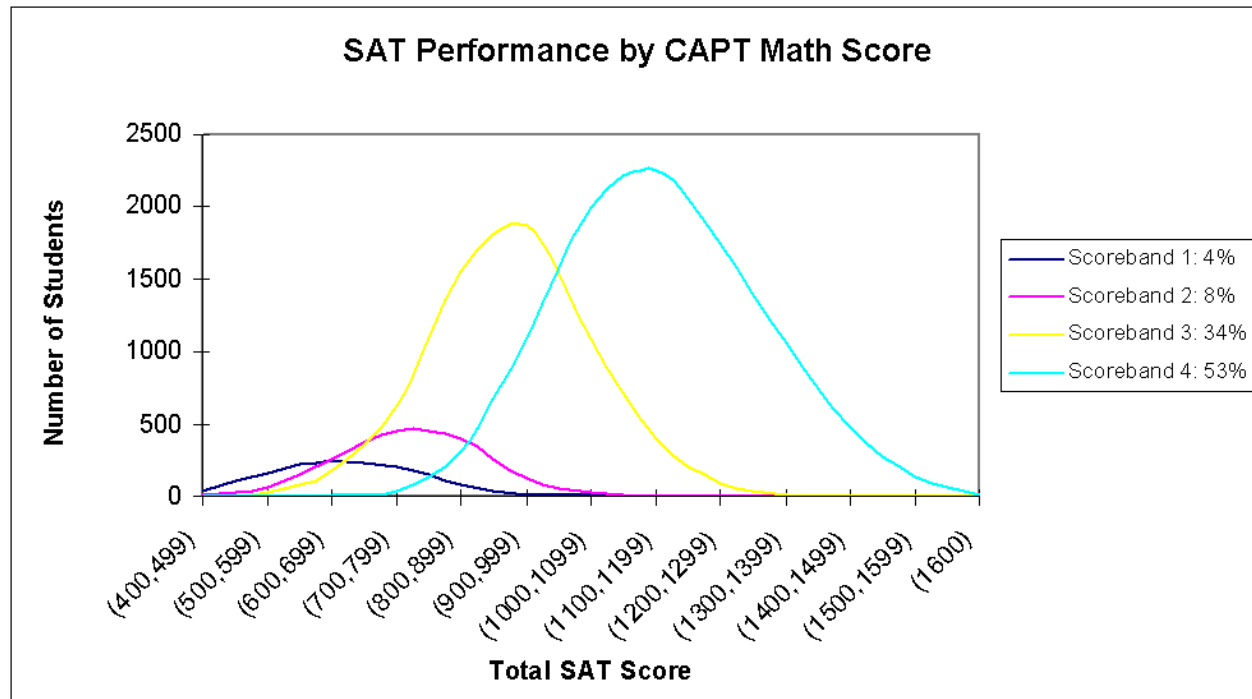
## a. Joint Distribution of CAPT and SAT



## 2. Overlaps between CAPT and SAT

### b.i. Distribution of SAT by CAPT Math score band

➤ A sizeable overlap in SAT by CAPT math score band

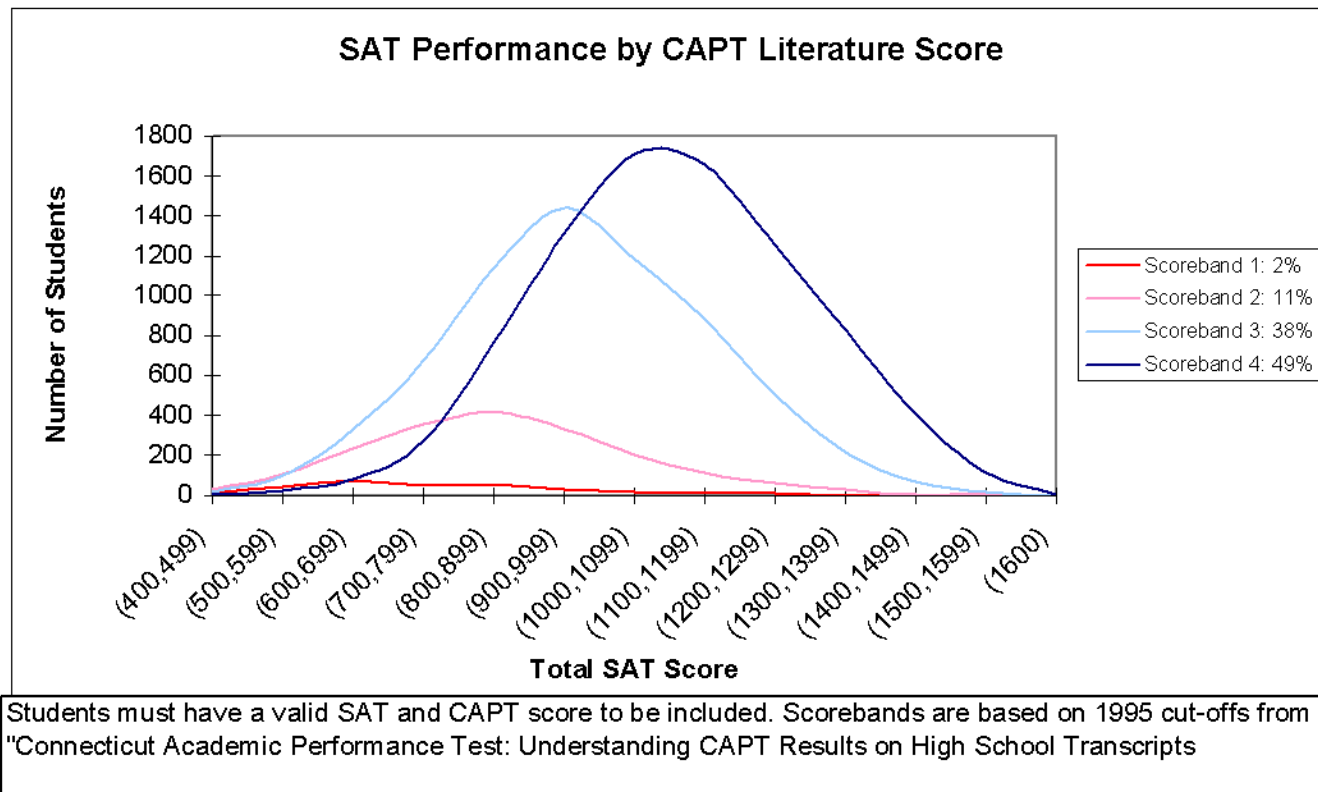


Students must have a valid SAT and CAPT score to be included. Scorebands are based on 1995 cut-offs from "Connecticut Academic Performance Test: Understanding CAPT Results on High School Transcripts"

## 2. Overlaps between CAPT and SAT

### b.ii. Distribution of SAT by CAPT Lit score band

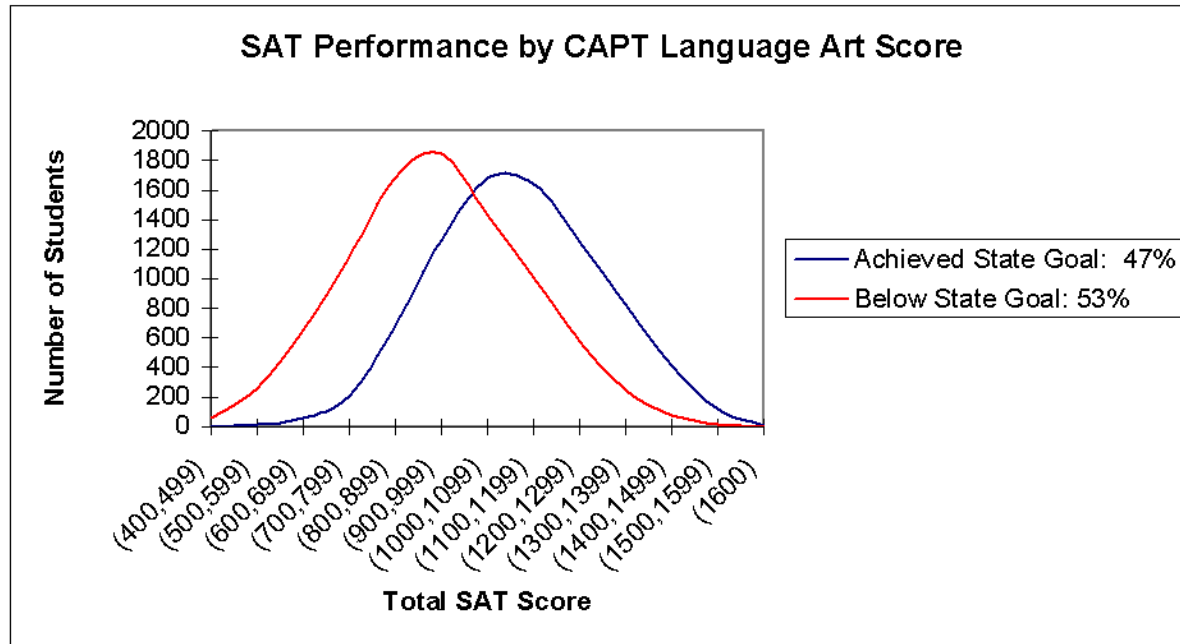
➤ But larger overlaps in SAT by CAPT literature score band



## 2. Overlaps between CAPT and SAT

### b.iii. Distribution of SAT by CAPT Lang Arts score band

➤ And the largest overlaps in SAT by CAPT language arts score band



## Differential Predictions of CAPT and SAT of post-high school success

➤ For most measures of success, both exams are good, independent predictors

| CAPT orientation | Joint Orientation                          |   | SAT orientation |
|------------------|--|---|-----------------|
| +                | a. Expressing positive interest in college |   | NA              |
| -                |  | b. Waiting longer to start college (a negative)           | +               |
| -                |  | c.i. Taking More English remediation courses (a negative) | -               |
| -                |  | c.ii. Taking More Math remediation courses (a negative)   | -               |
| +                | d. Taking more credits per semester        |   | 0               |
| +                |  | e.i. Passing greater percentage of courses                | -               |
| +                |  | e.ii. Passing More credits over semesters                 | +               |
| +                |  | f. Getting higher GPAs in college                         | +               |
| +                |  | g. Earning a degree                                       | +               |

### 3. Differential Predictive Ability of CAPT and SAT

#### a. Expressing positive interest in college

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- SAT cannot be used as a predictor of students' interest in college since "college interest" was defined in our study by students taking SAT.
- Race and ethnicity and the SES of the student's community have significant effects in a student's ultimate interest in college.
- Females would seem to have a lower probability of interest in college, but this result disappears after considering the positive effect that higher female test scores have on female enrollment.
- These variables explain nearly 16% of the variance in student interest in College. Such explanation is excellent for a data base as broad and diverse as the one being used.

### 3. Differential Predictive Ability of CAPT and SAT

#### b. Waiting longer to start college

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- Both SAT exams seem to be good predictors of the wait to get into college. But higher verbal SAT scores lead to longer waits before entering college, after considering math SAT scores. Higher verbal scores by themselves, however, like math scores do indeed shorten the wait.
- The decision to enroll in two year programs significantly lengthens the wait to start school, most likely because of the financial burdens so concomitant on students making the two year choice.
- Students with higher GPA's start more quickly than those with lower; and other than Asian students, racial and ethnic minorities take longer to start even after considering higher enrollments in two year college programs.
- Income per se does not seem to have its own direct effect on waiting time to start college.

### 3. Differential Predictive Ability of CAPT and SAT

#### c.i. Taking More English remediation courses

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- Remedial English taking is best predicted by considering separate and independent SAT and CAPT test results of students. As might be expected, all other possible explanations, after considering SAT and CAPT tests – income, student's community SES, race/ethnicity and even HS GPA have no contribution to the explanation of who takes remedial work, and how much of it.

### 3. Differential Predictive Ability of CAPT and SAT

#### c.ii. Taking More Mathematics remediation courses

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- ❑ Remedial math taking is more explicable than is remedial English taking, although there would seem to be a reasonable opportunity to narrow the unexplained variance in both math and English remediation (i.e., who takes remedial coursework, how much and why). This might be accomplished by making more uniform the institutional requirements of when to force remedial classes. Further, since both SAT and CAPT test results are available while the student is still in high school, there is ample lead time to begin remediation much earlier than in College.
- ❑ Taking remedial math seems, as English also did, to depend separately on both CAPT and SAT math exam scores. However, unlike English, remedial math seems to be taken less often by African American students and by those with high family incomes.

### 3. Differential Predictive Ability of CAPT and SAT

#### d. Taking More Credits per Semester

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- ❑ The variable considered to represent credit taking was calculated as a complex function of credits-per-semester/max credits-per-semester, spreading the variable's variance, while still leaving a relatively simple interpretation of the coefficients of the variables
- ❑ Positive coefficients on CAPT English components and on income and HS GPA all imply that higher values of these variables enhance the likelihood that a student will take more credits per semester. SAT verbal scores are substitutable for CAPT literature and editing scores, but they are not as strongly predictive as SAT scores. This is one of the success measures in which when used together, the different tests seem to negate one another.
- ❑ African-American students of all the racial/ethnic minorities seem to take fewer credits per semester than would be expected given their CAPT scores, income and HS GPA. Hispanic students also seem marginally likely to take fewer courses (but this shows up only when using SAT and not CAPT scores to standardize ability coming from high school).

### 3. Differential Predictive Ability of CAPT and SAT

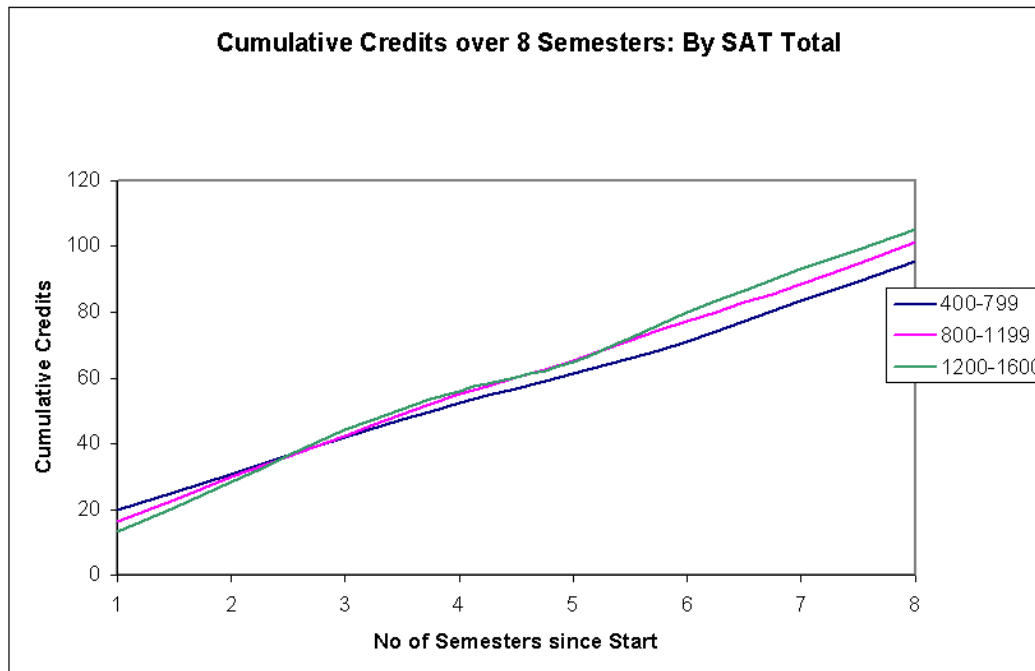
#### d. Taking More Credits per Semester

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- All five SAT and CAPT test scores appear to be important, independent explanations of students' rates of course passing. But of the tests only CAPT predicts a higher pass rate; higher SAT scores, paradoxically, seem to predict lower pass rates.
- Using only SAT scores, without considering CAPT scores, does not seem to affect the adverse relation between higher SAT scores and pass rates.
- There is no clear explanation of why all test scores are simultaneously significant nor of why the SAT had negative results. This deserves more research.
- Higher HS GPA's, as expected, significantly boost the percent of course work passed.
- Racial and ethnic minority students pass fewer courses than grades and HS GPA would predict them to pass.

### 3. Differential Predictive Ability of CAPT and SAT

#### e.ii. Passing More Credits by Semester vs. SAT Total



This graph, and the following four, show the cumulative credits earned by students by semesters since their first enrollment.

The students are segmented by score level on the exam pertinent to each graph, here by total SAT score on both math and verbal components.

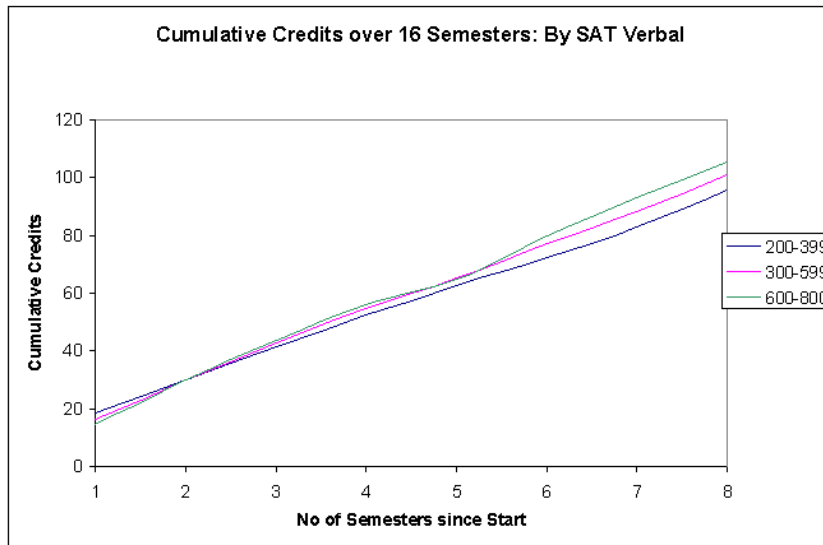
| SAT Range | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | percent remaining |
|-----------|------|------|------|------|------|------|------|------|-------------------|
| 400-799   | 627  | 446  | 395  | 325  | 285  | 251  | 229  | 202  | 32.2%             |
| 800-1199  | 3504 | 2517 | 2181 | 1921 | 1759 | 1573 | 1528 | 1388 | 39.6%             |
| 1200-1600 | 463  | 243  | 178  | 142  | 133  | 112  | 103  | 88   | 19.0%             |

The lines for all graphs show that higher scoring on exams lead to greater

accumulation of credits over time, consistent with the student being better prepared. The table at the bottom shows the number of students left at each semester, through eight semesters, in a potential career. The cohort does not stay, either because of attrition or transfer into another collegiate institution. Note that it is not always the best scoring segment that has the highest institutional retention rate.

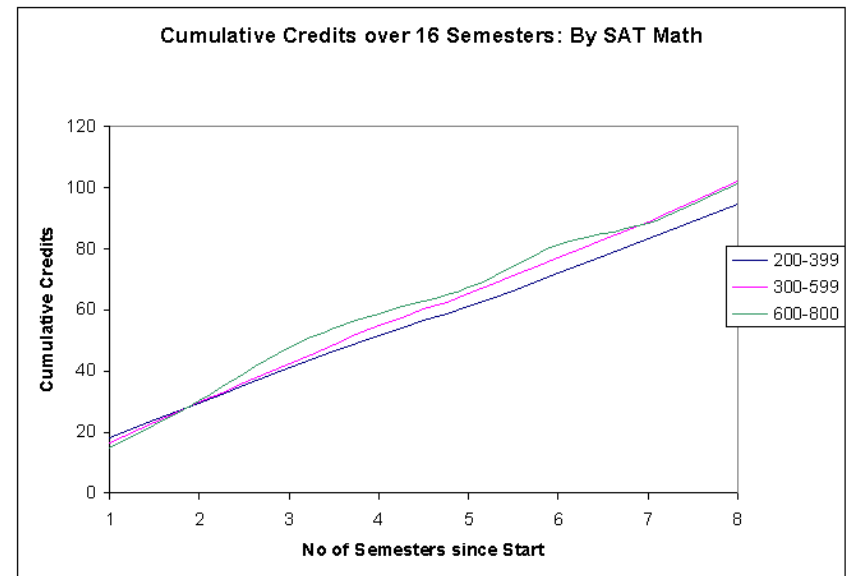
### 3. Differential Predictive Ability of CAPT and SAT

#### e.ii. Passing More Credits by Semester vs. SAT Components



| SAT Range      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | percent remaining |
|----------------|------|------|------|------|------|------|------|------|-------------------|
| <b>200-399</b> | 661  | 478  | 414  | 357  | 315  | 277  | 262  | 231  | 34.9%             |
| <b>300-599</b> | 3370 | 2411 | 2092 | 1820 | 1668 | 1487 | 1440 | 1305 | 38.7%             |
| <b>600-800</b> | 563  | 317  | 248  | 211  | 194  | 172  | 158  | 142  | 25.2%             |

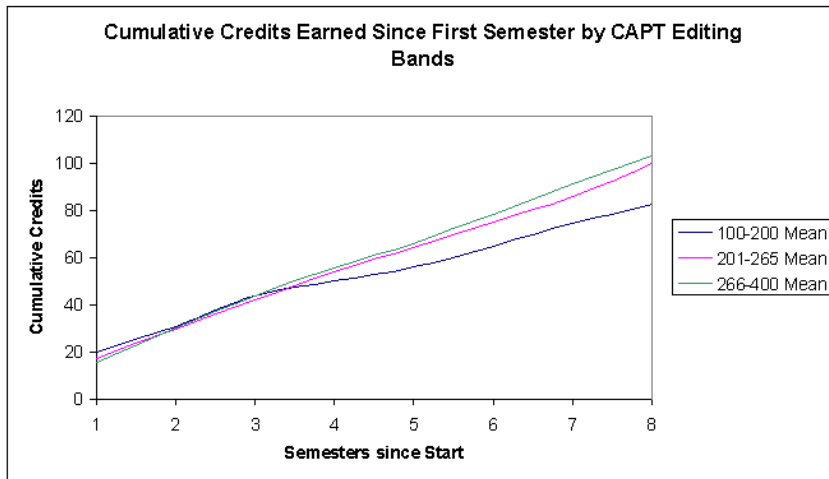
Differences in accumulated credits over 8 semesters appear to be bigger for differences in Verbal than in Math SAT exams, but as will show on the next two slides, smaller than for comparable CAPT subject tests.



| SAT Range      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | percent remaining |
|----------------|------|------|------|------|------|------|------|------|-------------------|
| <b>200-399</b> | 793  | 590  | 516  | 435  | 392  | 337  | 313  | 287  | 36.2%             |
| <b>300-599</b> | 3230 | 2307 | 2012 | 1765 | 1613 | 1455 | 1412 | 1279 | 39.6%             |
| <b>600-800</b> | 571  | 309  | 226  | 188  | 172  | 144  | 135  | 112  | 19.6%             |

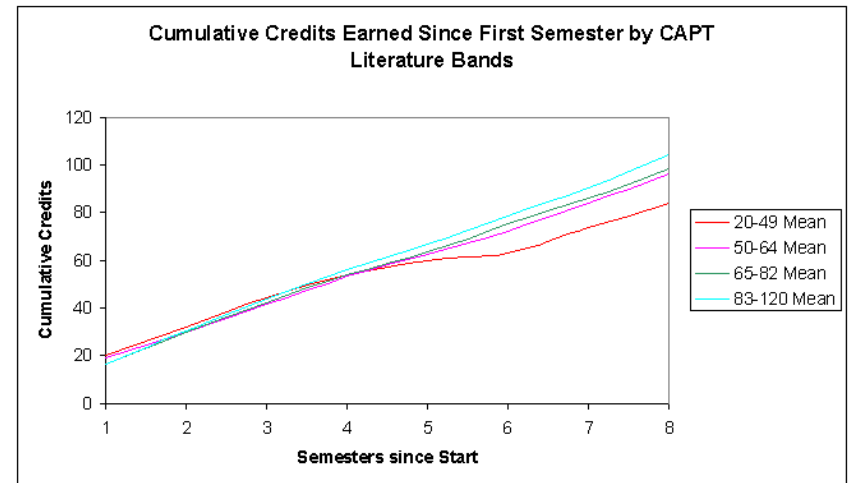
### 3. Differential Predictive Ability of CAPT and SAT

#### e.ii. Passing More Credits by Semester vs. CAPT English



| Band/Semester     | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | %remaining |
|-------------------|------|------|------|------|------|------|------|------|------------|
| Band 1: 100-200   | 209  | 154  | 122  | 97   | 89   | 74   | 71   | 66   | 31.6%      |
| Band 2/3: 201-265 | 2763 | 1992 | 1744 | 1488 | 1350 | 1199 | 1162 | 1038 | 37.6%      |
| Band 4: 266-400   | 2102 | 1378 | 1158 | 1026 | 931  | 830  | 769  | 690  | 32.8%      |
| No Edit Score     | 94   | 65   | 52   | 39   | 36   | 24   | 26   | 25   | 26.6%      |

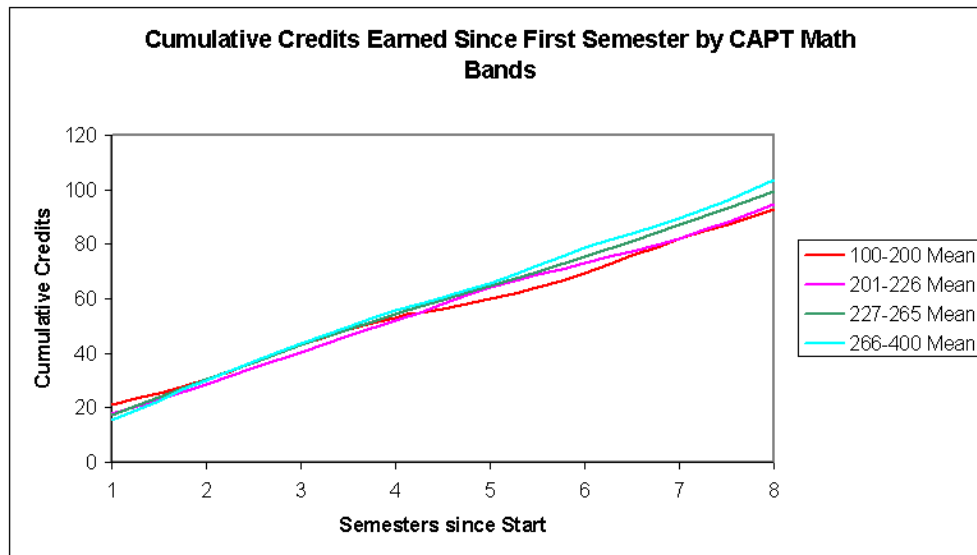
Differences in accumulated credits over 8 semesters are very large, 20.5 for CAPT literature and 20.7 for CAPT editing, implying nearly a year of difference in progress between those scoring at top and bottom CAPT scores.



| Band/Semester  | 1    | 2    | 3    | 4    | 5    | 6   | 7   | 8   | %remaining |
|----------------|------|------|------|------|------|-----|-----|-----|------------|
| Band 1: 20-49  | 98   | 65   | 54   | 43   | 38   | 24  | 22  | 17  | 17.3%      |
| Band 2: 50-64  | 625  | 465  | 388  | 327  | 297  | 269 | 248 | 214 | 34.2%      |
| Band 3: 65-82  | 2166 | 1538 | 1317 | 1134 | 1035 | 910 | 867 | 778 | 35.9%      |
| Band 4: 83-120 | 2186 | 1456 | 1265 | 1102 | 997  | 896 | 862 | 782 | 35.8%      |

### 3. Differential Predictive Ability of CAPT and SAT

#### e.ii. Passing More Credits by Semester vs. CAPT Math



Differences in progress over 8 semesters by those scoring well compared to those scoring poorly on CAPT Math are as expected—those with higher scores progress more quickly; but the differences in progress are half as large for high and low CAPT Math scorers as for high and low CAPT English scorers.

| Band/Semester   | 1    | 2    | 3    | 4    | 5    | 6   | 7   | 8   | %remaining |
|-----------------|------|------|------|------|------|-----|-----|-----|------------|
| Band 1: 100-200 | 223  | 161  | 135  | 108  | 98   | 81  | 74  | 67  | 30.0%      |
| Band 2: 201-226 | 460  | 339  | 295  | 255  | 226  | 194 | 181 | 162 | 35.2%      |
| Band 3: 227-265 | 2133 | 1558 | 1366 | 1173 | 1055 | 951 | 907 | 820 | 38.4%      |
| Band 4: 266-400 | 2213 | 1437 | 1207 | 1057 | 980  | 863 | 830 | 732 | 33.1%      |

### 3. Differential Predictive Ability of CAPT and SAT

#### f. Getting Higher GPAs in College

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- Surprisingly, Students' GPA's are explained by both SAT and CAPT English exams at the same time, suggesting that one exam does not simply substitute for the other. This result does not hold, however, when considering the math components of SAT and CAPT. In fact, there is little residual explanatory power of the one math exam once having considered the other of the math exams. That is, when both math exams are used, neither is significant; but when only one is used in the regression, it is significant—regardless of which is included.
- Income and HS GPA have the expected positive effect on College GPA.
- Women produce lower GPA's after taking into consideration their exam scores.
- Community SES seems to have only marginal effects.

### 3. Differential Predictive Ability of CAPT and SAT

#### g.i. Earning a Degree, if initially attending a 2 Yr School

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- Can't use SAT outcomes, largely because 2yr enrollees do not take SAT
- Poorer performance of Hispanic and "Other" race/ethnic students are largely explained by low income, sufficiently so that there is no noticeable differences between them and other groups once income of students is taken into consideration
- Of CAPT exam components, only the Literature exam explains differences in 2 year graduation rates
- HS GPA is highly explanatory of higher graduation rates of 2-year program starters

### 3. Differential Predictive Ability of CAPT and SAT

#### g.ii. Earning any Degree, Regardless of Start

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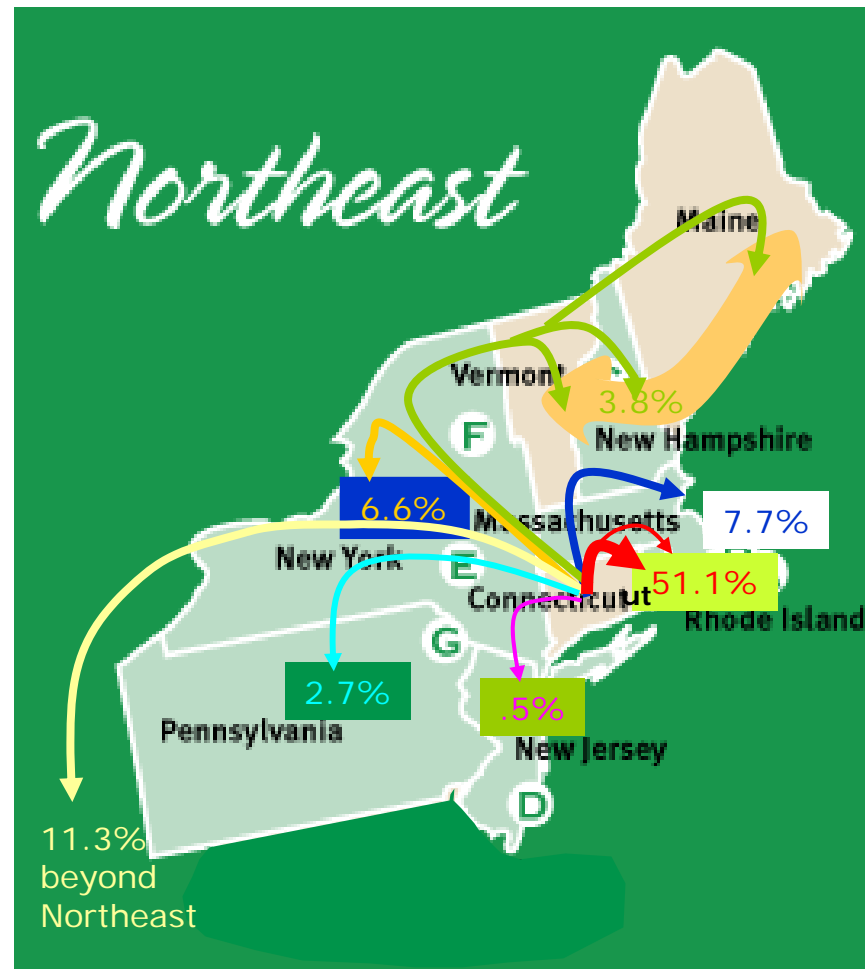
- We can explain 50% more of the individual variation in graduation rates for 4-yr entrants than we could for 2-yr entrants.
- SAT math and CAPT literature seemed to be the most powerful in explaining graduation, both implying that higher scores lead to higher probabilities of graduating.
- Higher SES of the student's community and higher income of the student's family are both positively related to higher graduation probabilities.
- Those with higher HS GPA's have higher graduation probabilities. This variable is the most powerful in predicting 2-yr program graduation
- Women have lower graduation probabilities, after considering their SAT and CAPT scores—which, other things constant, make them more likely to complete their degrees

## Conclusion #2: Connecticut Needs an Integrated Education— Labor Policy to Create Crucial Workforce Development

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1. Of Connecticut high school students going to college:
  - a. More than half go out-of-State to college,
  - b. All go to a panoply of colleges and
  - c. Few go to or graduate from CT private colleges
  
2. The public institutions seem to act as an integrated unit,
  - a. doing what most expect of the various levels, and
  - b. graduating reasonable proportions of their students
  
3. There is a significant brain drain from Connecticut because
  - a. There is too large a portion of the “bright kids” who don’t go on to any college after high school, and
  - b. For those who do, all too often, the brightest go out of State for college
  
4. Strategies would utilize the public system more

1. Connecticut high school students going to college
    - a. More than half go out-of-State for college
- 



# 1. Connecticut high school students going to college c.i. Few go to private higher educational segments

NSC Record of First School Attended, Recoded to NMEF Segments by MISER

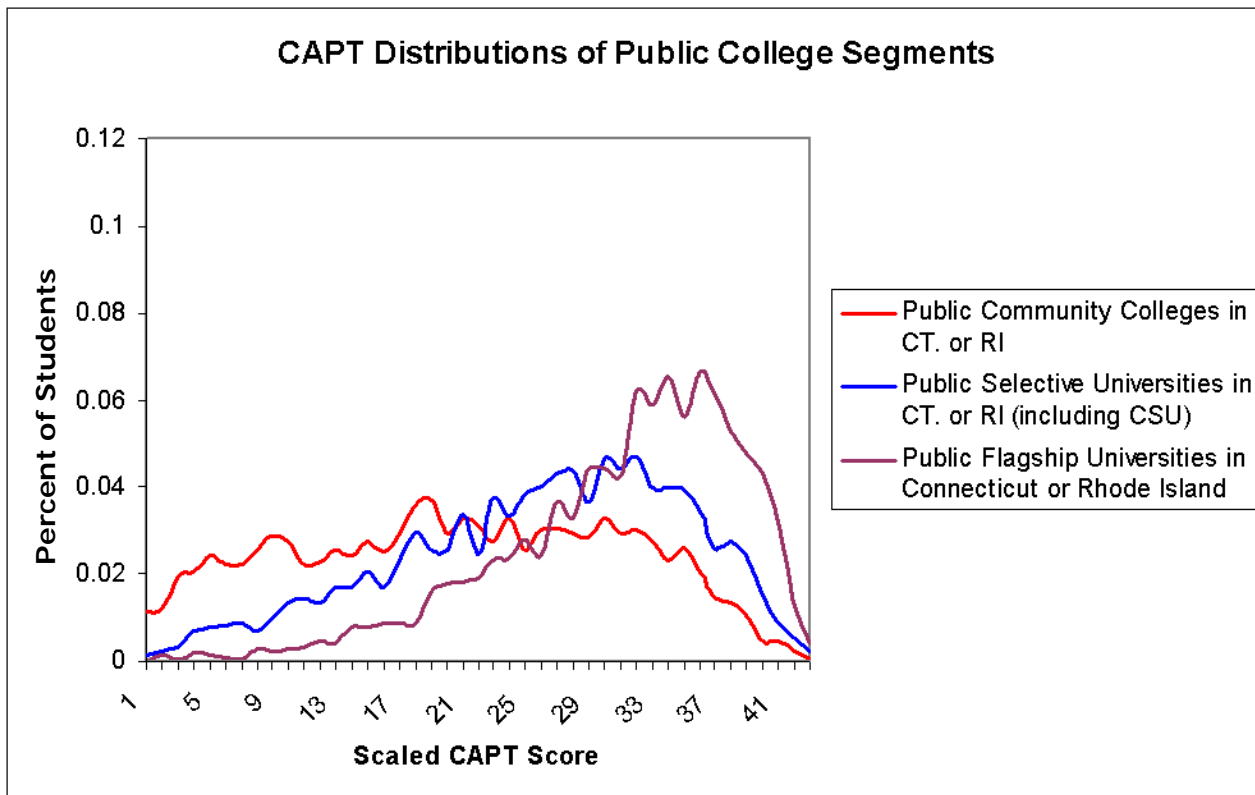
|  | By Numbers of Students | By Percentage of Students |
|--|------------------------|---------------------------|
| 4 Yr Highly Selective Private Colleges                 | 145                    | 0.7%                      |
| 4 Yr Selective Private Colleges                        | 1,222                  | 5.7%                      |
| 2 Yr Private Junior Colleges                           | <u>164</u>             | <u>0.8%</u>               |
| Subtotal Private Institutions                          | 1,531                  | 7.1%                      |
| Public Flagships                                       | 2,378                  | 11.1%                     |
| State College System                                   | 3,378                  | 15.7%                     |
| Community College System                               | <u>3,715</u>           | <u>17.3%</u>              |
| Subtotal Public Institutions                           | <u>9,471</u>           | <u>44.0%</u>              |
| Connecticut and Rhode Island Colleges and Universities | 11,002                 | 51.1%                     |
| Massachusetts Colleges and Universities                | 1,665                  | 7.7%                      |
| Vermont, New Hampshire and Maine Colleges              | 814                    | 3.8%                      |
| New York Colleges                                      | 1,427                  | 6.6%                      |
| New Jersey Colleges                                    | 99                     | 0.5%                      |
| Pennsylvania Colleges                                  | 588                    | 2.7%                      |
| Colleges Outside of the Northeast                      | 2,426                  | 11.3%                     |
| Unknown Colleges                                       | 3,472                  | 16.1%                     |
| Uncodable <sup>1</sup>                                 | <u>22</u>              | <u>0.1%</u>               |
| Likely Going to College                                | 21,515                 | 100.0%                    |
| Not Going to College                                   | <u>11,138</u>          | <u>34.1%</u>              |
| Total Taking CAPT in 1996                              | 32,653                 | 100.0%                    |

<sup>1</sup>Includes 1 at Bay Path Graduate Prog., 2 at N.E. School of Law, 7 at differently coded UConn programs, and another 9 difficult to code  
Since the HS graduating class of 1998, there appear to be significant increases in College attendance of Connecticut HS graduates  
in Connecticut

## 2. Integrated activities of CT Public Higher Education

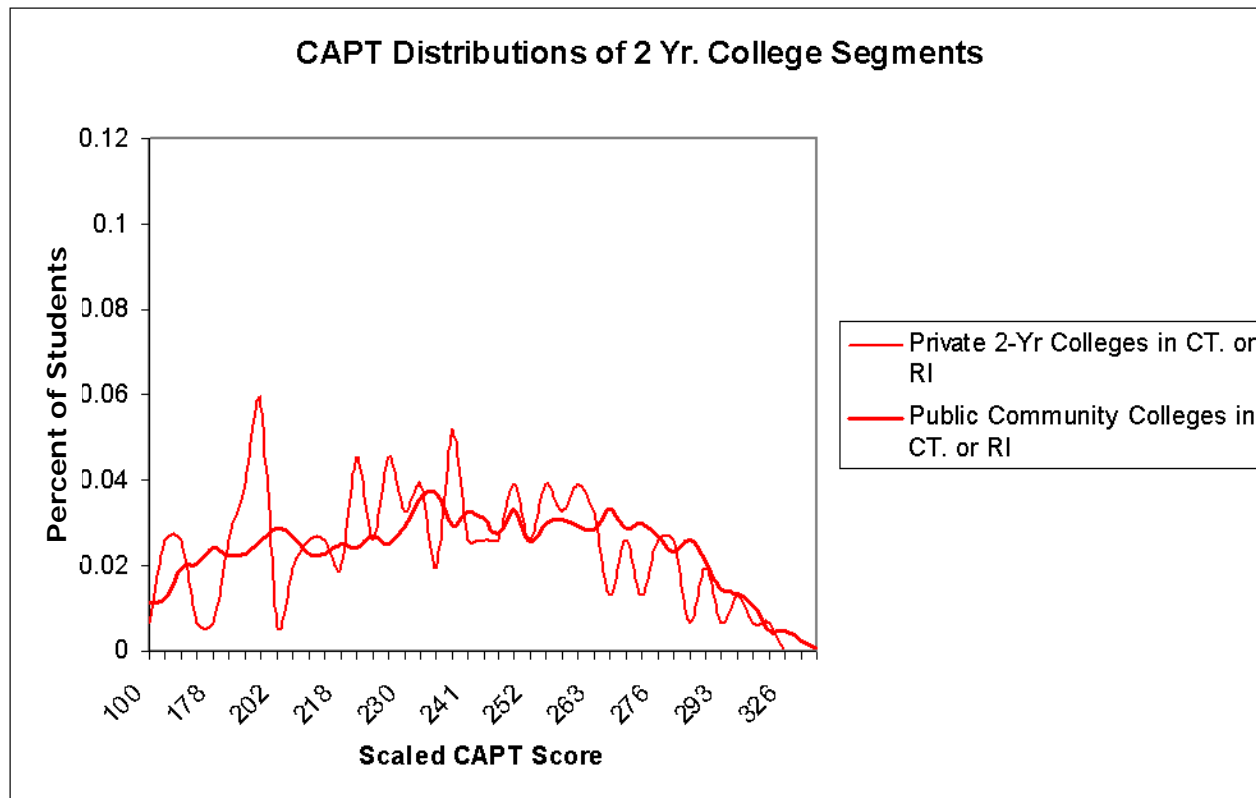
a.i. providing a diversity of access, opportunity, and competition across the various segments

➤ The three public sectors do what is expected of them



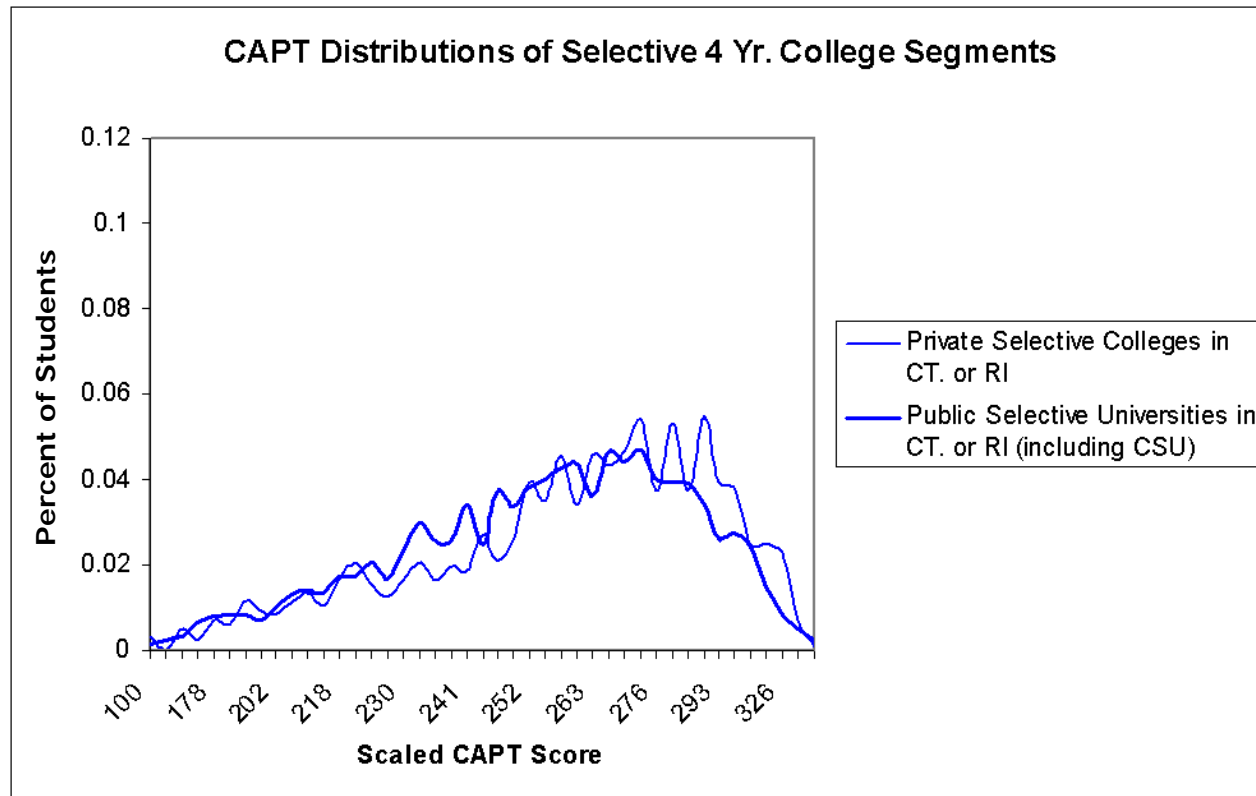
## 2. Integrated activities of CT Public Higher Education

a.ii. open admissions provide a start for students at all levels of talent while keeping Comm. Colleges competitive with private 2-Yr institutions



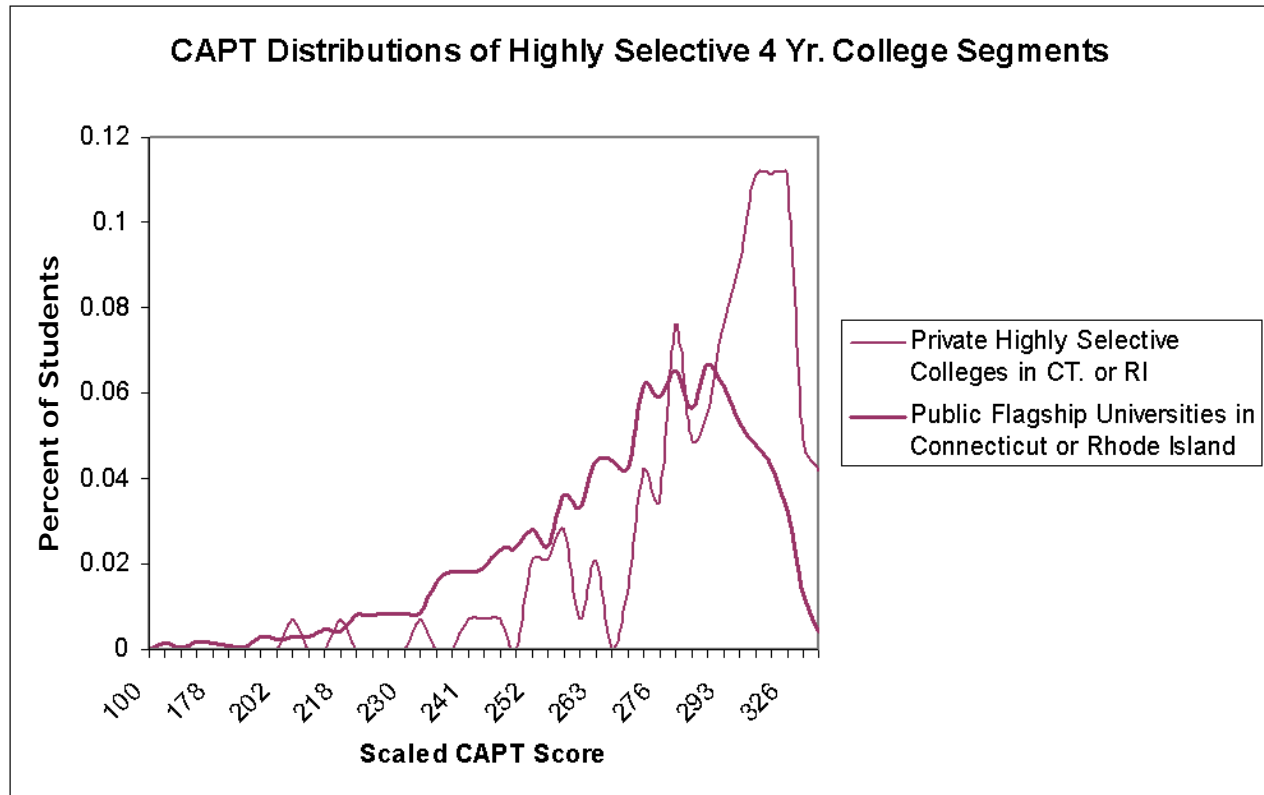
## 2. Integrated activities of CT Public Higher Education

a.iii. The 4-Yr CSU system, provides more entering competition, yet looks like the large number of private selective colleges



## 2. Integrated activities of CT Public Higher Education

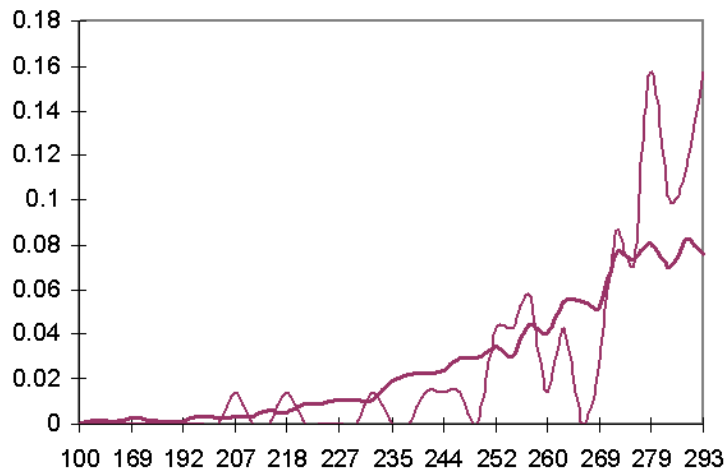
a.iv. Up to 293 on CAPT, the cumulative distribution of CAPT scores at the Univ. of Connecticut is quite similar to those at the highly selective institutions of the region



## 2. Integrated activities of CT Public Higher Education

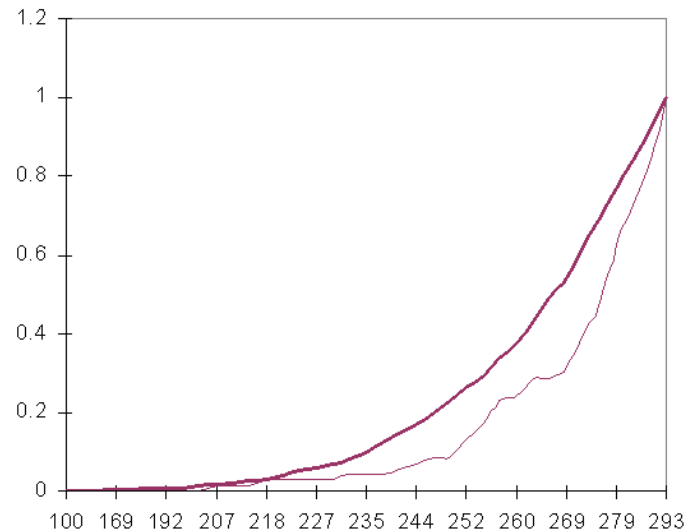
a.iv. Up to 293 and certainly to 279 on CAPT, UConn looks even more like the highly selective institutions of the region

**Conditional Probability of CAPT Scores  $\leq 293$ , Comparing Private Highly Selective Colleges and The University of Connecticut**



— Public Flagship Universities in Connecticut or Rhode Island  
— Private Highly Selective Colleges in CT. or RI

**Cumulative Distribution of CAPT Scores  $\leq 293$**

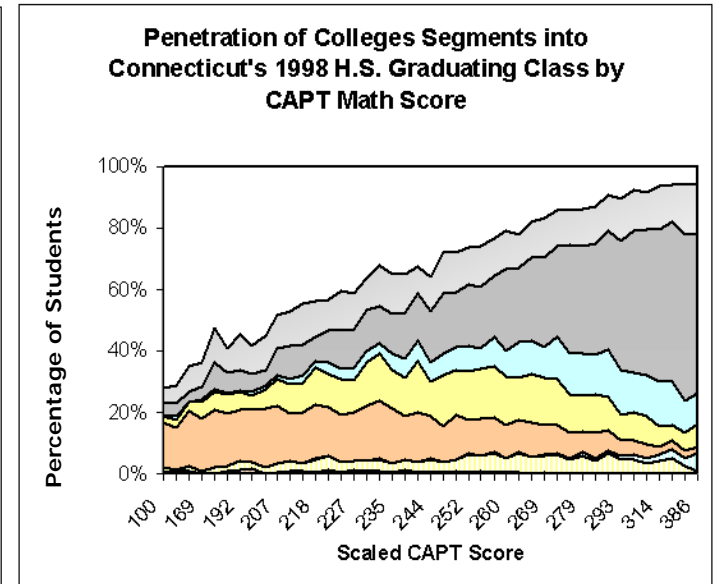
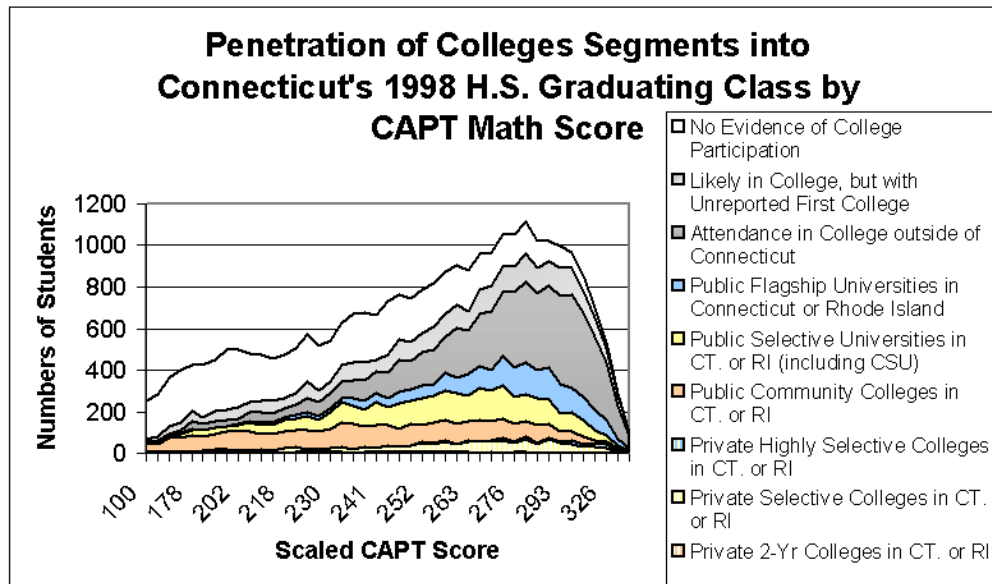


— Public Flagship Universities in Connecticut or Rhode Island  
— Private Highly Selective Colleges in CT. or RI

### 3. There is a Significant Connecticut Brain-drain

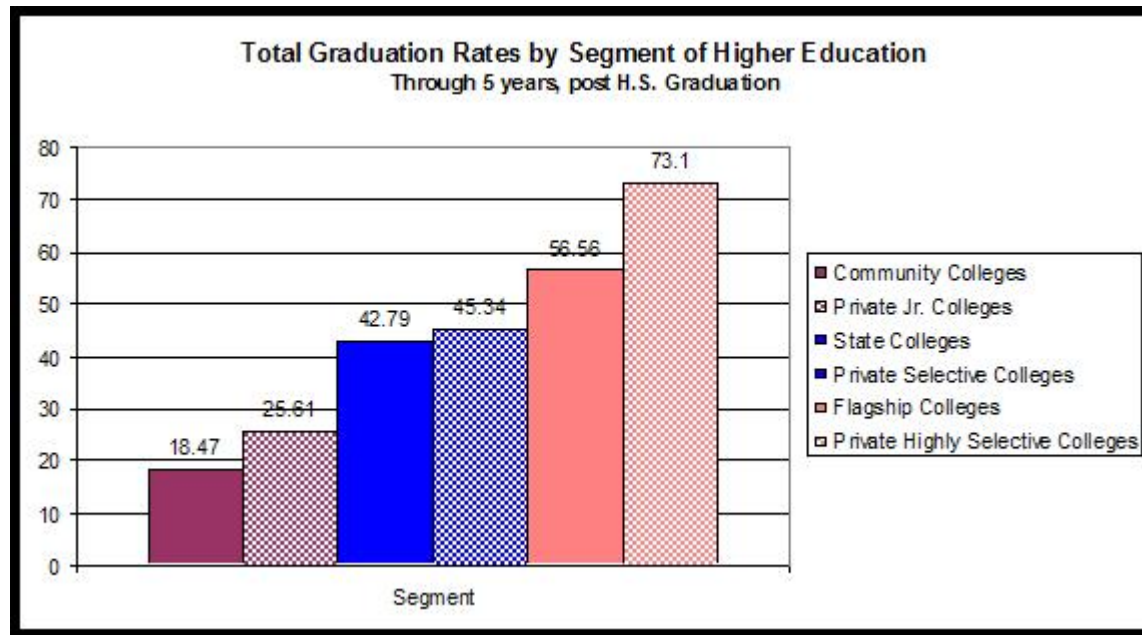
a. a too large a portion of bright kids don't go to any college after high school, and

b. for those who go to College, all too often, the brightest go out-of-State



## 4. Higher Ed. Strategies for Workforce Development

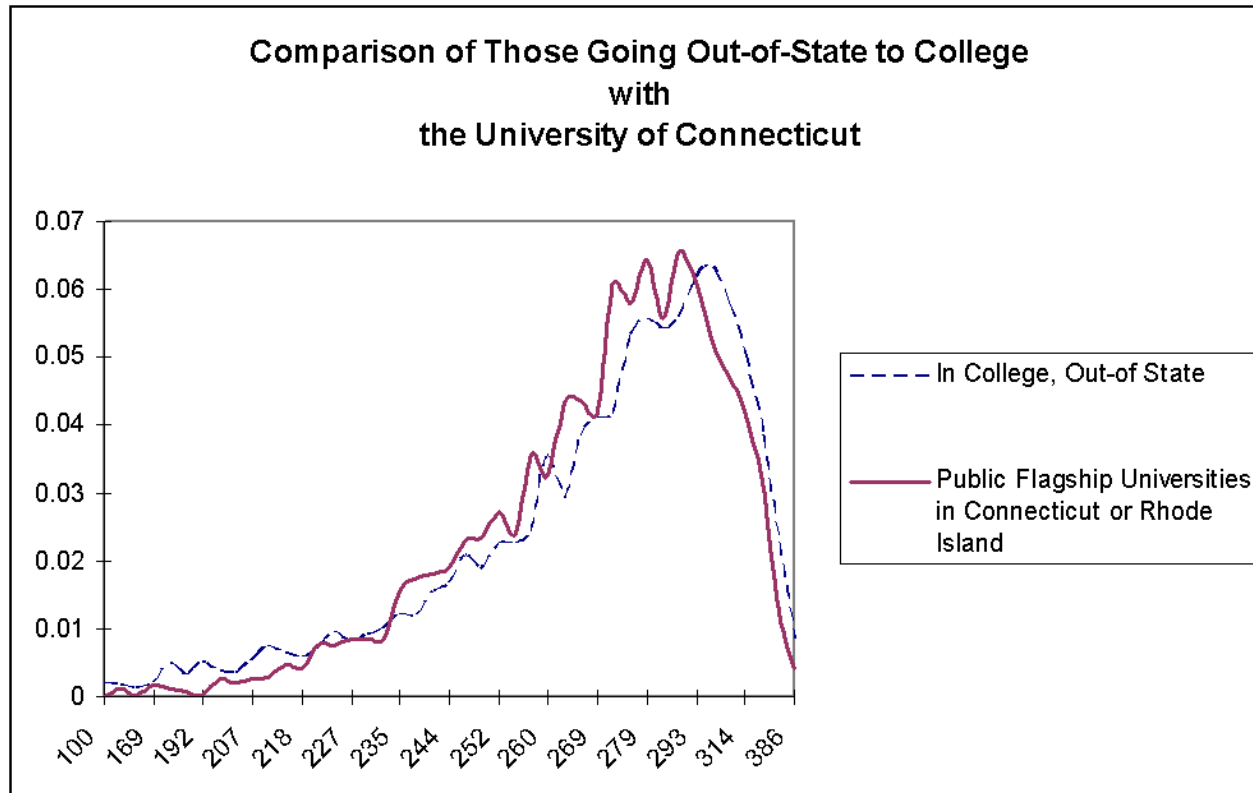
### a. Public Sector Graduation Outcomes nearly equal Private Institutions



Note: this is a cohort of students who largely graduated from high school in 1998, starting college in the named NMEF segment. Not all students included in the figure would have had five years of enrollment in college, since some may have started college after a substantial delay after high school. Others may have started and left by attrition. Still others may need a sixth or seventh year of study. Expectations are that this will relatively increase public college graduation rates. Also note that graduation may be from any institution, not necessarily one in the named segment.

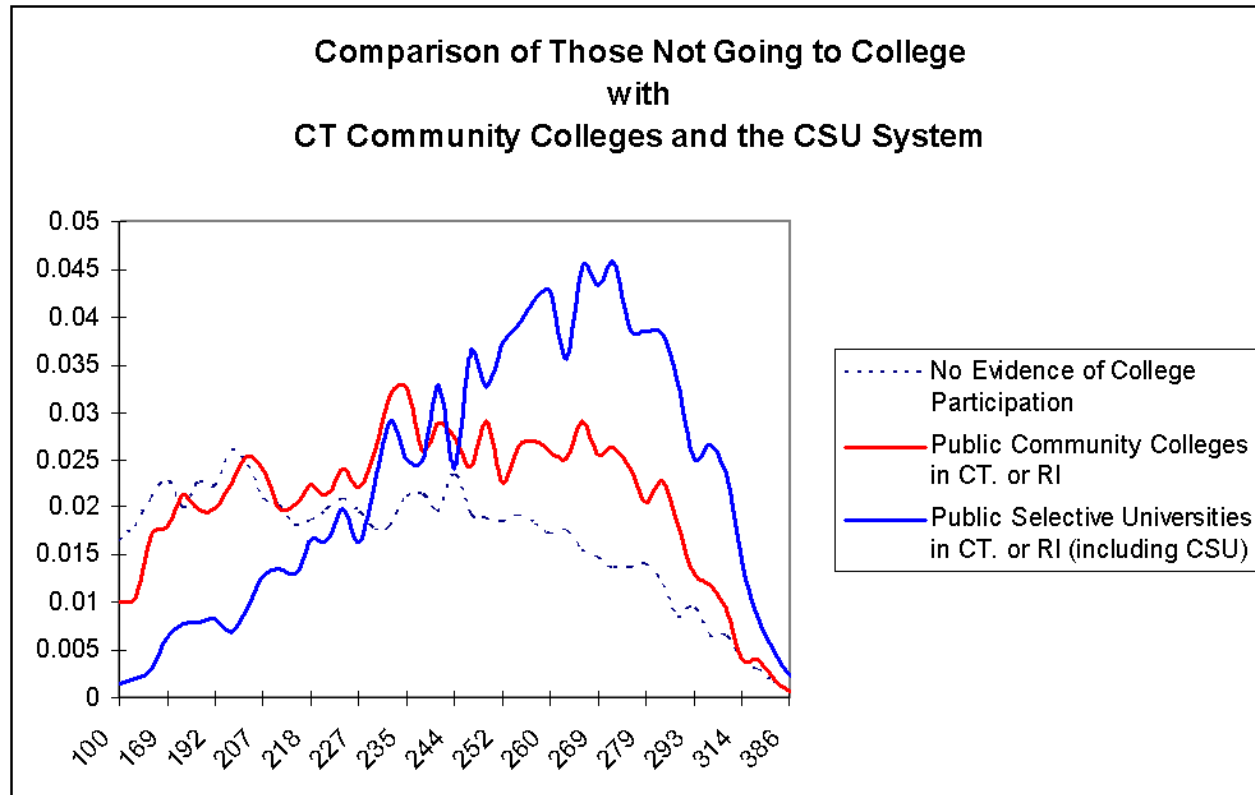
## 4. Higher Ed. Strategies for Workforce Development

b. Quality of Those Leaving the State and Those at UConn are equal



## 4. Higher Ed. Strategies for Workforce Development

c. Quality of Not Continuing to College and Those at CSU are equal



## 4. Higher Ed. Strategies for Workforce Development

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### At the University of Connecticut

- ❖ Build capacity at UConn to attract those leaving the State
- ❖ Strengthen the UConn Valedictorian/Salutatorian Scholarship Program

### At CSU and the Community Colleges

- ❖ Establish Programs at CSU and the Community Colleges to attract those not currently continuing after high school

### And, everywhere:

- ❖ Implement loan interest reduction programs for students depending on speed of completing their programs and eventual location for work
- ❖ Involve students while still in college in more internship opportunities to develop student knowledge of Connecticut business
- ❖ Consider entrepreneur opportunities for students who graduate from Connecticut colleges and who stay in State