

**A Comparison of Graduation Rates:  
Transfers and Continuing Students at 4-year University  
Main Campuses**  
*University System of Ohio Institutions*

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**September 2014**

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## Report Summary

The state of Ohio has developed a comprehensive system that allows transfers and continuing students with equivalent academic records to complete degrees in a comparable manner. Transfer friendly policies in the state have increased individuals' access to higher education, as evidenced in annual transfer volumes comfortably exceeding the 40,000 mark. With a highly developed system helping large-scale transfer movements in the state, it is important to ask how the increased access relates to academic success. This report answers the important question by addressing three specific issues.

- a. How do the average rates of graduation compare between transfers and continuing students attending 4-year university main campuses in the University System of Ohio (USO)?
- b. Why do graduation rates differ between transfers and continuing students?

It is important to note that transfers and continuing students differ with respect to demographic, economic and academic characteristics. The report investigates how differences in the individual characteristics between transfers and continuing students influence their differential rates of graduation.

- c. What is the impact of the Transfer Assurance Guide (TAG) on the graduation rates of transfer students?

TAG is a state initiative that guarantees that credits received in approved pre-major and beginning-major courses transfer and apply to meeting degree requirements in all institutions in the USO. TAG-guarantees are based on the foundation that approved equivalent courses offered at different institutions in the USO have the same learning outcomes. The estimated impact of TAG on graduation rates is used to validate the claim of equivalency of the learning outcomes.

### Results from the report:

#### How do graduation rates compare between transfers and continuing students?

When compared to 4-year university freshman cohorts, transfer students, sophomores and juniors combined, have higher average six-year rates of graduation.

##### Six-Year Graduation Rates

|   |   |
|---|---|
| FY2003-04 Freshman Cohort:<br>4-year university main campus | FY2003-04 Community College Transfers:<br>Sophomores and Juniors combined |
| 60.0%   | 68.4%   |

However, when transfers and 4-year university students are matched by rank, sophomores with sophomores and juniors with juniors, transfer students are found to graduate at lower rates.

##### Six-Year Graduation Rates

|           |   |   |
|-----------|---|---|
|           | FY2003-04 Continuing students:<br>4-year university main campus | FY2003-04 Transfer students:<br>From community colleges |
| Sophomore | 81.6%   | 60.7%   |
| Juniors   | 91.5%   | 75.7%   |

#### Why do graduation rates differ so much in rank-based comparisons?

Community college transfers are different from 4-year university students in important characteristics; they are older, less affluent and academically less prepared. These characteristics are all correlated with lower rates of graduation.

### **Do we know how the individual characteristics influence the differential rates of graduation?**

Yes. The gap in graduation rates between continuing students and transfers narrows considerably when the influence of individual characteristics are taken into account. For sophomores, the gap shrinks from 20.9 points to 7.9 points, and for juniors, the gap reduces from 15.8 points to 7.7 points.

### **Which individual characteristics have the largest influence?**

Students' age: The sophomore community college transfer student is 23.4 year old on average. However, if the transfer student had an average age of 21.1 years, the average age of the 4-year university main campus student, the gap in graduation rates would decline by 7.2 points.

Family income: The sophomore community college student has an average family income of \$63,213. If her income was \$85,067, the average income of 4-year university students, the gap in graduation rates would decline by 2.5 points.

Prior academic preparation: Of sophomore community college transfers, 52.3% had received remedial education prior to transferring to a 4-year university main campus. If the remedial education rate was only 19.2%, the proportion of remedial education recipients among 4-year university students, the gap in graduation rates would shrink by 2.9 points.

### **Why does age have such a big influence on the gap in graduation rates?**

Age represents the combined unfavorable influence of a variety of factors including financial constraints related to family responsibilities and reduced eligibilities for financial aid.

### **What is the impact of the Transfer Assurance Guide (TAG) on the graduation rates of transfer students?**

TAG is an initiative of the Ohio Board of Regents, implemented in FY2005-06. TAG provides statewide guarantees that credits received in beginning major and pre-major courses transfer and apply to meeting degree requirements in institutions in the USO. TAG, therefore, reduces the need for course repetition for transfer students, helping them save time and money.

The TAG-guarantee on credit transfer and application to meeting degree requirement is based on the foundation of course equivalency. TAG-approved courses offered by different institutions in the system are equivalent by design; they have the same learning outcomes.

However, if learning outcomes of TAG-approved equivalent courses are not the same in all institutions, students transferring to the academically demanding institutions, mainly the 4-year university main campuses will not be adequately prepared for the required level of rigor. Consequently, their subsequent academic outcomes will be adversely affected.

On the other hand, if learning outcomes of TAG-approved courses are indeed the same across institutions in the USO, students' mastery of the content of the course would be the same regardless of whether they receive credit for such courses completed at a different institution prior to the transfer or if they complete the equivalent courses at the receiving institution after the transfer. The guarantee of credit transfer under TAG, therefore, will not influence their mastery of the course content or the measures of subsequent academic outcomes including college graduation.

The report validates the claim of equivalency by estimating the impact of TAG on the graduation rates of transfer students. The results show that the graduation rates of transfer students are not influenced by TAG, implying that learning outcomes of TAG-approved courses are the same throughout the system.

## Section I. Introduction

The primary goal of the report is to compare graduation rates of continuing students and transfer students attending 4-year university main campuses in the University System of Ohio (USO). Continuing students are individuals who have been continuously enrolled in the same 4-year university main campuses following initial enrollments as freshman students. Transfer students, in contrast, had transferred to the 4-year main campuses from 2-year institutions, 4-year regional campuses, or other 4-year main campuses. The comparison of graduation rates between the two groups reveals differential success patterns of students who attend 4-year university main campuses at the same point in time but had arrived there following different routes: as freshman starters or via the transfer path.

The report also investigates why transfers and continuing students attending 4-year university main campuses go on to graduate at vastly different rates. Although graduation rates may differ because the two groups take different routes to the 4-year main campuses, it is important to recognize that transfers and continuing students differ also with respect to demographic, academic and economic characteristics, factors that are known to influence academic outcomes. Accordingly, this report investigates how graduation rates compare between continuing students and transfers once their differences in the individual characteristics are taken into account.

Finally, the report estimates the impact of the *Transfer Assurance Guide* (TAG) on the graduation rates of transfer students. TAG, an initiative of the Ohio Board of Regents (OBR), was implemented in FY2005-06. TAG guarantees that credits received in approved equivalent pre-major and beginning-major courses transfer and apply to meeting degree requirements in institutions within the system. Given its statewide guarantee, TAG directly reduces the need for course repetition among students who transfer from one institution to another, saving them time and money.

The TAG-transfer guarantee is based on the foundation that learning outcomes associated with approved equivalent courses offered by different institutions in the system are the same. The determination of course equivalencies follows a rigorous process: Courses offered by different institutions are approved as comparable, compatible and equivalent by panels of USO faculties if they meet the 70% standard of equivalency adopted by the *Ohio Articulation and Transfer Advisory Council*. Equivalencies are determined course-by-course, using both the content and the performance expectations of individual courses.

However, if the learning outcomes of TAG-approved equivalent courses offered by different institutions are not the same, students who transfer to academically demanding institutions will have inadequate preparations for success. It is possible, therefore, that the subsequent academic outcomes of students transferring to especially the 4-year university main campuses could be adversely affected. In light of the substantial expected benefits of TAG and the potential for compromised academic standards, this report estimates the impact of TAG on the graduation rates of transfer students, thereby testing the equivalency of learning outcomes of TAG-approved courses across institutions in the system.

Ohio has a long history of facilitating transfer movements among its public institutions of higher education. Building on the transfer policy of the early 1990s, the state now has a comprehensive system that allows transfers and continuing students with equivalent academic records to complete degrees in a comparable manner. While it is evident that transfer-friendly policies in the state have generally increased individuals' access to higher education – annual transfer volumes comfortably exceed the 40,000 mark – it is important to know how the increased access relates to success. This report, therefore, serves an important purpose as it compares graduation rates of transfers and continuing students, identifies factors influencing such comparisons, and validates the equivalency of learning outcomes of TAG-approved courses.

The report uses two different approaches in comparing graduation rates. The first approach compares average graduation rates between transfer students and freshman cohorts at 4-year university main campuses. Institutional researchers at 4-year universities have commonly used such comparisons to inform enrollment management decisions. The second approach matches transfers and continuing 4-year university main campus students by rank – sophomores with sophomores and juniors with juniors – and compares their average graduation rates. The *comparison by rank* reveals how transfers and continuing students proceed to graduation from a similar point in their academic careers.

Using data from four different cohorts of transfers and continuing students, from FY2003-04, FY2004-05, FY2006-07, and FY2007-08, the report finds that graduation rate comparisons yield different results depending on the approach one follows. When compared to a freshman cohort, as in the first approach, transfer students graduate at higher rates. The 4-year main campus freshman cohort of FY2003-04, for example, has a (six-year) graduation rate of 55.0%, whereas 68.4% of the FY2003-04 cohort of community college transfers to 4-year main campuses – sophomores and juniors combined – graduated in six years. Similarly, among the FY2003-04 4-year regional and main campuses transfers, sophomores and juniors combined, 75.4% and 75.5%, respectively, went on to graduate in six years.

However, when transfers are matched with continuing students by rank, as in the second approach, they graduate at lower rates. Sophomore continuing students at 4-year universities in FY2003-04, for example, have a six-year graduation rate of 81.6%, while the FY2003-04 sophomore transfers from community colleges, 4-year regional campuses, and other 4-year main campuses have six-year graduation rates of 60.7%, 68.0%, and 74.7%, respectively. Similarly, continuing juniors at 4-year main campuses (FY2003-04 cohort) have six-year graduation rates of 91.5%, while junior transfers from community colleges, 4-year regional campuses, and other 4-year main campuses have six-year graduation rates of 75.7%, 83.9%, and 77.0%, respectively.

The following example explains why the two approaches provide different results. Assume that 100 students begin in a 4-year university freshman cohort, and 80 of them advance to the rank of sophomore in the following year. Moreover, 64 of the sophomores go on to graduate. The sophomore continuing students, therefore, have a graduation rate 80% ( $64 \div 80$ ), although the freshman cohort graduation rate is only 64% ( $64 \div 100$ ). Now assume that 100 sophomore students transfer to the 4-year university, and 70 of them go on to graduate (70% rate of graduation). When the sophomore transfer students are compared to the freshman cohort, as in the first approach, transfers graduate at a higher rate – 70% vs. 64%. However, when sophomore transfers are compared to sophomore continuing students, as in the second approach, continuing students graduate at a higher rate – 80% vs. 70%.

It is evident that when matched by rank, continuing students at 4-year main campuses graduate at substantially higher rates relative to students who transfer to the same campuses, prompting questions on why such large differences occur. The report finds that differences in the demographic, economic, and academic characteristics between transfers and continuing students account for a large part of the difference in their average rates of graduation. In fact, the observed difference in the average rates of graduation between continuing students and the community college transfers declines from 20.9 points to 7.9 points when the influences of the individual characteristics are taken into account. The result highlights the fact that the pathways to the 4-year university main campuses – freshman enrollment or the transfer route – have a smaller influence on students' eventual graduation outcomes.

Finally, the report estimates the impact of TAG on the graduation rates of transfer students. The difference-in-difference (DID) estimator used in the report compares graduation rates before and after TAG implementation separately for transfers and the continuing students. Because transfer students received the benefits of TAG, any post-TAG change in their average rate of graduation represents the impact of TAG plus the influence of other factors that also changed after the implementation of TAG.

Continuing students, on the other hand, did not receive the benefits of TAG. As such, any change in their average rates of graduation represents only the influence of the other factors. A comparison of the two differences, accordingly, nets out the influences of the other factors, and provides the impact of TAG.

Learning outcomes of TAG-approved courses are the same across institutions in the system by design. Consequently, students' command over the content of TAG-approved courses should be the same regardless of whether they complete such courses at 2-year institutions or at 4-year university main campuses. By the same token, subsequent academic outcomes of transfer students should be the same regardless of whether they receive credit for TAG-approved courses completed at other institutions prior to the transfer or if they complete such courses at the receiving institutions after the transfer. TAG, therefore, should not affect average academic outcomes including graduation outcomes of students who transfer to 4-year university main campuses.

The report finds that TAG indeed does not influence graduation rates of transfer students. The data show that the average graduation rate of sophomore transfers from community colleges increased by 2.7 points after TAG. The average graduation rate of the sophomore continuing students also increased after TAG implementation, by 1.1 points. Once the two differences are compared, TAG appears to have increased the average graduation rate of the sophomore transfers by 1.6 points. However, the estimate is statistically insignificant, meaning that TAG did not influence graduation rates of the sophomore community college transfer students. The report finds similarly statistically insignificant impacts of TAG on the graduation rates of the junior transfer students. These estimates clearly validate the underlying premise of the TAG initiative: Learning outcomes of TAG approved courses are the same in the USO.

The rest of the report is organized as follows: definitions are described in section II, while descriptive statistics and analytical results are presented in sections III and IV, respectively. The impact of TAG is described in section V, and concluding remarks are in section VI.

## **Section II. Definitions**

This section provides definitions of key concepts used in the report, namely transfers, continuing students, and graduation rates.

The report follows two approaches in comparing graduation rates of transfers and continuing students.

**Comparison with a freshman cohort:** Graduation rates of all transfer students – sophomores and juniors combined – are compared to graduation rates of selected freshman cohorts.

**Comparison by rank:** Graduation rates of sophomore transfer students are compared to the graduation rates of sophomore continuing students. Similarly, graduation rates of junior transfer students are compared to the graduation rates of junior continuing students.

In both approaches, the core groups of transfer students – sophomores and juniors – are defined in an identical manner. This section begins with the common definition of transfer students, followed by alternative definitions of continuing students, and definitions of graduation rates.

### **II.A Definition of transfer students**

A student is considered a transfer student if s/he satisfies separate conditions on transfer, attendance intensity, rank, and highest degree received prior to the transfer. Students transferring from 4-year university regional campuses have to satisfy a separate condition regarding their destination campuses. Although the report uses data from four different cohorts, definitions of important concepts are illustrated with reference to the FY2003-04 cohort.

**Transfer requirement:** A student (from the FY2003-04 cohort) meets the transfer requirement if she satisfies any of the following three conditions.

- a. The student attended an institution in the USO in FY2002-03 and formally transferred credits to a 4-year university main campus in the USO in FY2003-04.
- b. The student attended an institution in the USO in FY2002-03 and did not formally transfer credit to a 4-year university main campus in FY2003-04. However, the student attended a single 4-year university main campus in the USO in FY2003-04 that was different from her original college of attendance in FY2002-03.
- c. The student attended an institution in the USO in FY2002-03 and did not formally transfer credit to a 4-year university main campus in FY2003-04. However, the student attended multiple institutions in FY2003-04 and attempted the maximum number of hours in a 4-year university that was different from her original college of attendance in FY2002-03.

**Attendance intensity requirement:**

Upon transferring, the student attended the 4-year university as a full-time student; full-time attendance requires the student to attempt at least 12 semester or quarter hours in one term or at least 24 semester or equivalent hours in the entire academic year.

**Rank requirement:**

The rank is determined by the 4-year university and is from students' first term of attendance in the institution in FY2003-04. This report considers transfer students of two specific ranks: sophomores and juniors.

**Highest degree requirement:**

The student did not receive a baccalaureate degree in FY2002-03 or previous years.

**Regional campus students:**

Transfer students from regional campuses of 4-year universities transferred to their respective affiliated main campuses.

**II.B Definition of continuing students**

A continuing sophomore or junior at a 4-year university main campus has to satisfy conditions on continued enrollment, attendance intensity, rank, highest degree, and non-transfer.

**Continued enrollment requirements:**

- a. The student was enrolled at a 4-year university main campus in the USO in FY2002-03. The student is required to have begun her college education as a first-time freshman student at the same 4-year university main campus in FY2002-03 or previous years.
- b. The student was enrolled in the same 4-year university main campus in FY2003-04.

**Attendance intensity requirements:**

The student was enrolled as a full-time student in the 4-year university main campus in 2003-04; full-time attendance is defined identically for continuing and transfer students.

**Rank requirement:**

The rank is from students' first term of attendance in the institution in 2003-04. This report considers continuing students of two specific ranks: sophomores and juniors.

**Highest degree requirement:**

The student did not receive a baccalaureate degree in 2002-03 or previous years.

**Non-transfer requirement:**

The student did not transfer out of the 4-year university in 2003-04.

## **II.C Rationale for selection criteria**

Four important exclusion criteria contribute to the selection of the samples used in this report. First, students with less than full-time attendance in a 4-year university in 2003-04 are excluded; the exclusion is in line with the tradition of calculating graduation rates for a stable component of the student body – full-time students. The second and the third criteria lead to the exclusion of freshman and senior students, respectively; the need to compare appropriately matched representative groups of transfer and continuing students drives those two exclusions.

Freshman students are excluded because those students retained the freshman rank in 2002-03 and also in 2003-04. Students who retain the same freshman rank in two consecutive years are generally a small and non-representative section of continuing students at 4-year universities.

The exclusion of senior students is based on the observation that seniors transferring from especially community colleges had accumulated enough 4-year university credits prior to the transfer. As a result, graduation rates of senior transfer students do not reflect on the academic performance of community college transfers to 4-year universities.

Students from regional campuses usually transfer to their affiliated main campuses. Because post-transfer progression patterns of regional campus students who transfer to non-affiliated main campuses can be very different from those transferring to affiliated campuses, this report includes only the latter.

## **II.D Definition of graduation rates**

### **Graduation rates for transfer students:**

#### **Rank-based comparison:**

In rank-based comparison, graduation rates are calculated separately for sophomore and junior transfer students. For each group, graduation rates are defined as the respective proportion that received a baccalaureate degree from any 4-year university in the USO in six years following the transfer. For the FY2003-04 transfer cohort for example, graduation outcomes are tracked until FY2008-09.

#### **Comparison with a freshman cohort:**

In the comparison with a freshman cohort, graduation rates are calculated for the combined group of sophomore and junior transfer students. For the combined group, graduation rates are defined as the proportion that received a baccalaureate degree from any 4-year university in the USO in the six-year period following the transfer.

### **Graduation rates for continuing students:**

#### **Rank-based comparison:**

In rank-based comparison, graduation rates are calculated separately for sophomore and junior continuing students. For each group, graduation rates are defined as the respective proportion that received a baccalaureate degree from any 4-year university in the USO in six years following the transfer; for the FY2003-04 cohort, for example, graduation outcomes are tracked until FY2008-09.

#### **Comparison with a freshman cohort:**

In comparison with a freshman cohort, graduation rates are calculated as the proportion of the freshman cohort that received a baccalaureate degree from any institution in the USO in six years after initial enrollment.

### Section III. Results: Descriptive statistics

#### III.A Samples

The report uses two samples, one for sophomores and one for juniors. Each sample comprises continuing students at 4-year university main campuses and students who transfer to 4-year main campuses from community colleges, 4-year regional campuses, and other 4-year main campuses. The report draws on data for each sample from four cohorts: FY2003-04, FY2004-05, FY2006-07, and FY2007-08. Table 1 and 2 provide breakdowns of sample compositions for sophomores and juniors, respectively.

**Table 1.** Transfers and Continuing Students from FY2003-04, FY2004-05, FY2006-07, and FY2007-08: Sophomores Only.

| Cohort    | Sample size | Continuing students | All transfers | Transfer students from: |                          |                      |
|-----------|-------------|---------------------|---------------|-------------------------|--------------------------|----------------------|
|           |             |                     |               | Community Colleges      | 4-year regional campuses | 4-year main campuses |
| FY2003-04 | 26,881      | 23,414              | 3,467         | 1,500                   | 1,062                    | 905                  |
| FY2004-05 | 26,708      | 23,210              | 3,498         | 1,538                   | 990                      | 970                  |
| FY2006-07 | 26,384      | 22,547              | 3,837         | 1,682                   | 1,177                    | 978                  |
| FY2007-08 | 27,147      | 23,180              | 3,967         | 1,644                   | 1,299                    | 1,024                |

**Table 2.** Transfers and Continuing Students from FY2003-04, FY2004-05, FY2006-07, and FY2007-08: Juniors Only.

| Cohort    | Sample size | Continuing students | All transfers | Transfer students from: |                          |                      |
|-----------|-------------|---------------------|---------------|-------------------------|--------------------------|----------------------|
|           |             |                     |               | Community Colleges      | 4-year regional campuses | 4-year main campuses |
| FY2003-04 | 24,706      | 21,783              | 2,923         | 1,562                   | 915                      | 446                  |
| FY2004-05 | 24,276      | 21,311              | 2,965         | 1,655                   | 852                      | 458                  |
| FY2006-07 | 24,990      | 22,011              | 2,979         | 1,702                   | 868                      | 409                  |
| FY2007-08 | 24,474      | 21,434              | 3,040         | 1,772                   | 867                      | 401                  |

Table 1 shows that continuing students account for a lion's share of the sophomore sample for each of the four cohorts. Among transfer students, community college students are easily the largest section, as they account for more than 40% of the transfer student body. Students transferring from 4-year regional campuses and from other 4-year main campuses are similar in number.

Table 2 shows that similar to the sophomore sample in table 1, continuing students account for a very large part of the junior sample as well. The transfer student body, however, is substantially different between the sophomore and junior years. The important difference is with respect to numbers; fewer students transfer to 4-year university main campuses in the junior year than in the sophomore year. Interestingly, the decline in the number of transfers in the junior year is contained almost exclusively among those who transfer from one 4-year university main campus to another.

### III.B Comparison of graduation rates

#### Comparison with a freshman cohort:

An important goal of this report is to compare graduation rates of transfers and continuing students at 4-year university main campuses. The comparison is obtained following two different approaches. The first approach compares graduation rates of incoming transfer students from a given year to the graduation rates of the freshman cohort at 4-year institutions from the same year. The particular approach is common among institutional researchers; enrollment managers at individual institutions utilize this information to predict future enrollment levels. Table 3 presents a comparison of graduation rates using this approach.

**Table 3.** Six-year Graduation rates of 4-Year University Freshman Cohorts and Transfers students (sophomores and juniors combined): FY2003-04 to FY2007-08 Cohorts.

| Cohorts   | Graduation rates                              |                  |  |  |  |
|-----------|---|------------------|--|--|--|
|           | [1]   | [2]              | [3]                                      | [4]  | [5]  |
|           | Freshman students:<br>4-year main<br>campuses | All<br>transfers | Transfers from:<br>Community<br>Colleges | Transfers from:<br>4-Year Regional<br>Campuses | Transfers from:<br>4-year Main<br>Campuses |
| FY2003-04 | 60.0%   | 72.1%            | 68.4%                                    | 75.4%  | 75.5%                                      |
| FY2004-05 | 61.0%   | 73.1%            | 69.3%                                    | 78.1%  | 75.2%                                      |
| FY2006-07 | 62.0%   | 74.7%            | 70.3%                                    | 78.8%  | 79.3%                                      |
| FY2007-08 | -   | 73.8%            | 70.0%                                    | 77.2%  | 77.9%                                      |

Note: The six-year graduation rate for the FY2007-08 freshman cohort was not available at the time the report was finalized.

Table 3 shows that transfer students have a higher rate of graduation relative to freshman cohorts at 4-year institutions. For example, the FY2003-04 freshman cohort at 4-year university main campuses have a six-year graduation rate of only 60.0% while transfer students to 4-year universities from the same year have average graduation rates of 72.1%. Columns [3], [4] and [5] of table 3 show that graduation rates vary substantially among the transfer students as well: students transferring from community colleges, 4-year regional campuses and other 4-year university main campuses (from the FY2003-04 cohort) have average graduation rates of 68.4%, 75.4% and 75.5%, respectively.

Although transfer students from 4-year regional and main campuses graduate at higher rates relative to the community college transfers, the latter still graduates at higher rates relative to the 4-year main campus freshman cohorts, as seen in columns [1] and [3] of table 3. This particular feature of the data, i.e., transfer students from all sources graduating at higher rates relative to 4-year main campus freshman cohorts, owes to the composition of the two groups. Transfer students include sophomores and juniors whereas the freshman cohort has only freshman students, as its name suggests. The implications of comparing graduation rates between groups comprising students with different ranks are given below.

Assume that there are 100 students in a 4-year main campus freshman cohort. Also assume that 20 of them leave college in the first year while the remaining 80 advances to the rank of sophomore in the following year. Subsequently, 64 of the 80 sophomores go on to graduate. Based on the above, the average rate of graduation for the sophomore continuing students is 80% ( $64 \div 80$ ) although the freshman cohort graduation rate is only 64% ( $64 \div 100$ ). Now assume that 100 students, all with the rank

of sophomore, transfer to the institution. Further assume that 70% of those transfer students go on to graduate. Based on the above information, it is easy to see that when compared with the sophomore transfers, the freshman cohort has a lower rate of graduation – 64% to 70%. However, when the sophomore continuing students are compared to the sophomore transfers, they have a higher rate of graduation – 80% to 70%.

**Comparison with rank-based matching:**

In rank-based comparison, graduation rates are compared between 4-year main campus continuing students and incoming transfers with the same ranks – sophomores with sophomores or juniors with juniors. Table 4 provides rank-based comparisons between continuing students and transfers with the rank of sophomore while table 5 reports the comparison for juniors.

Table 4 reveals two prominent features. First, continuing sophomore students graduate at a higher rate relative to sophomore transfer students. Among the FY2003-04 cohort sophomores for example, continuing students have a six-year graduation rate of 81.6% while transfers from community colleges, 4-year regional campuses and 4-year main campuses graduate at 60.7%, 68.0% and 74.7%, respectively. Second, graduation rates for both continuing students and transfer students stay stable over time; continuing students have the highest graduation rate of 82.6% for the FY2006-07 cohort, and the lowest graduation rate of 81.0% for the FY2004-05 cohort. Similarly, variations in graduation rates of transfer students among different cohorts are also small.

**Table 4.** Six-year Graduation rates of 4-Year University Continuing Students and Transfers students: Sophomores from FY2003-04 to FY2007-08 Cohorts.

| Cohorts          | Graduation Rates   |                             |                   |               |
|------------------|--|-----------------------------|-------------------|---------------|
|                  | Sophomore continuing students at 4-year university main campuses | Sophomore Transfer students |                   |               |
|                  |  | Community colleges          | Regional campuses | Main campuses |
|                  | [1]  | [2]                         | [3]               | [4]           |
| FY2003-04 cohort | 81.6%  | 60.7%                       | 68.0%             | 74.7%         |
| FY2004-05 cohort | 81.0%  | 61.4%                       | 70.8%             | 73.5%         |
| FY2006-07 cohort | 82.6%  | 65.0%                       | 72.6%             | 76.0%         |
| FY2007-08 cohort | 82.1%  | 62.5%                       | 72.5%             | 77.1%         |

Similar to table 4, table 5 shows that continuing (juniors) students graduate at higher rates relative to the junior transfers. Among the FY2003-04 juniors for example, the 4-year main campus continuing students have a six-year graduation rate of 91.5% while transfer students from community colleges, 4-year regional campuses, and 4-year main campuses have average graduation rates of 75.7%, 83.9% and 77.0%, respectively. Graduation rates for both continuing students and transfer students are stable over time; continuing students have the highest graduation rate of 91.5% for the FY2003-04 cohort, and the lowest rate of graduation of 90.2% for the FY2004-05 cohort. Similar to table 4, table 5 also shows that variations in graduation rates of transfer students from different cohorts are small.

**Table 5.** Six-year Graduation rates of 4-Year University Continuing Students and Transfers students: Juniors from FY2003-04 to FY2007-08 Cohorts.

| Cohorts          | Graduation Rates  |                          |                   |               |
|------------------|---|--------------------------|-------------------|---------------|
|                  | Junior continuing students at 4-year university main campuses | Junior Transfer students |                   |               |
|                  |   | Community colleges       | Regional campuses | Main campuses |
|                  | [1]   | [2]                      | [3]               | [4]           |
| FY2003-04 cohort | 91.5%   | 75.7%                    | 83.9%             | 77.0%         |
| FY2004-05 cohort | 90.2%   | 76.3%                    | 86.5%             | 78.8%         |
| FY2006-07 cohort | 91.1%   | 75.7%                    | 83.4%             | 80.7%         |
| FY2007-08 cohort | 91.0%   | 77.0%                    | 84.2%             | 80.0%         |

From a comparison of tables 4 and 5, it is apparent that juniors graduate at much higher rates relative to sophomores. For example, column [1] of table 4 shows that continuing 4-year main campus sophomore students from the FY2003-04 cohort have an average rate of graduation of 81.6%. However, column [1] of table 5 shows that continuing 4-year main campus junior students from FY2003-04 have an average graduation rate of 91.5%. Based on the above, 4-year university continuing students appear to increase the probability of graduation by almost 10-points when they successfully convert from the rank of sophomore to the rank of junior.

The extent of the gain in graduation rates by persisting from the rank of sophomore to the rank of junior, however, is much larger for transfer students. For example, column [2] of table 4 shows that the sophomore community college transfer students from the FY2003-04 cohort have an average rate of graduation of only 60.7%. However, column [2] of table 5 shows that junior community college transfer students from the same cohort have an average six-year graduation rate of 75.7%. In other words, graduation probabilities of community college transfer students are 15.0 points higher when they have enough pre-transfer credit to be assigned the rank of junior (relative to sophomores) after transferring to 4-year main campuses. By the same token, FY2003-04 junior transfers from 4-year regional campuses also have a substantially higher rate of graduation relative to the sophomores.

**Comparison results in a nutshell:**

1. When compared to the freshman cohorts at 4-year universities, transfer students, sophomores and juniors combined, graduate at higher rates.
2. When graduation rates of transfers and continuing students are compared by student rank, transfer students graduate at substantially lower rates. The difference in the graduation rates are the largest between continuing students and community college transfers.
3. Graduation rates of transfers and continuing students are substantially higher among juniors than they are among sophomores. The observation implies that transfer students from community colleges and 4-year regional campuses have a much higher chance of success once they persist to the rank of juniors (from the rank of sophomores).

**Section IV. Analytical results**

**IV.A Why do continuing students graduate at a higher rate?**

The rank-based comparison in tables 4 and 5 shows that among students at a similar point in their higher education careers, those who begin and continue at 4-year university main campuses go on to graduate at higher rates relative to students who transfer to the 4-year universities.

What causes graduation rates to differ between transfers and the continuing students? While some of the differences in the average rates of graduation between continuing students and transfers could be due to their differences in the pathways to the 4-year university main campuses, it must be taken into consideration that transfers and continuing students differ also with respect to other important determinants of education outcomes. The differences in demographic, economic, and academic characteristics between the two groups could drive their differences in graduation rates to some extent.

This section describes differences in the individual characteristics between transfers and continuing students. Table 6 reports the summary statistics on individual characteristics between sophomore continuing students and sophomore transfer students, and table 7 reports the same statistics for junior continuing students and junior transfers. The data on tables 6 and 7 refer to the FY2003-04 cohort. Similar tables on the FY2004-05, FY2006-07, and the FY2007-08 cohorts are available on request.

**Table 6.** Individual Characteristics of FY2003-04 Sophomores Students: 4-Year University Continuing Students and Transfer Students from Community colleges, 4-year Regional, and Main Campuses.

|   | 4-Year Main Campus Continuing Students<br>N=23,414 | Transfers: From               |                                     |                               |
|---|--|-------------------------------|-------------------------------------|-------------------------------|
|   |  | Community Colleges<br>N=1,500 | 4-Year Regional Campuses<br>N=1,062 | 4-Year Main Campuses<br>N=905 |
| <b>Graduation Rate</b>                      | <b>81.6%</b>                                       | <b>60.7%</b>                  | <b>68.0%</b>                        | <b>74.7%</b>                  |
| Male  | 46.6%  | 51.1%                         | 49.6%                               | 45.6%                         |
| Age (in years)                              | 21.1   | 23.4                          | 22.5                                | 21.3                          |
| White                                       | 82.8%  | 80.8%                         | 91.5%                               | 85.3%                         |
| Black                                       | 9.0%   | 10.3%                         | 3.2%                                | 7.7%                          |
| Asian                                       | 2.6%   | 2.3%                          | 1.5%                                | 1.1%                          |
| Hispanic                                    | 1.7%   | 2.0%                          | 0.5%                                | 1.2%                          |
| American Indian                             | 0.4%   | 0.3%                          | 0.2%                                | 0.3%                          |
| Races not known                             | 4.3%   | 4.3%                          | 3.0%                                | 4.3%                          |
| <b>Remedial education and family income</b> |  |                               |                                     |                               |
| Had received remedial education             | 19.2%  | 52.3%                         | 36.3%                               | 24.0%                         |
| Family Income (in 2008-09 prices)           | \$85,067   | \$63,213                      | \$73,103                            | \$82,316                      |

Table 6 shows that demographic, economic, and academic characteristics generally differ between continuing students and transfers, and the differences are the most pronounced between continuing students and community college transfers.

The differences in individual characteristics between continuing students and community college transfers are concentrated in students' age, family income, and the proportion of remedial education recipients. Community college transfer students are older, less affluent, and with a higher proportion of remedial education recipients among them. The average family income of continuing students and community college transfers are \$85,067 and \$63,213, respectively, a gap of more than \$20,000. Similarly, the proportion of remedial education recipients – 19.2% and 52.3%, respectively – show a wide difference in prior academic experience between the two groups. The average community college transfer student is also almost two years older than the average continuing student. Table 6, however, does not show substantial differences with respect to either ethnicity or gender between continuing students and community college transfers. The statistics presented in table 6 suggest that differences in age, income, and remedial education proportions are likely contributors to the large difference in graduation rates between the two groups.

**Table 7.** Individual Characteristics of FY2003-04 Junior Students: 4-Year University Continuing Students and Transfer Students from Community colleges, 4-year Regional and Main Campuses.

|   | 4-Year Main Campus Continuing Students | Transfers: From    |                          |                      |
|---|--|--------------------|--------------------------|----------------------|
|   |  | Community Colleges | 4-Year Regional Campuses | 4-Year Main Campuses |
|   | N=21,783                               | N=1,562            | N=915                    | N=446                |
| <b>Graduation Rate</b>                      | 91.5%                                  | 75.7%              | 83.9%                    | 76.9%                |
| Male  | 45.8%                                  | 48.8%              | 40.2%                    | 46.4%                |
| Age (in years)                              | 22.1                                   | 25.0               | 24.3                     | 22.8                 |
| White                                       | 84.7%                                  | 80.9%              | 93.7%                    | 85.7%                |
| Black                                       | 6.9%                                   | 10.0%              | 2.8%                     | 7.4%                 |
| Asian                                       | 2.9%                                   | 2.6%               | 1.1%                     | 1.1%                 |
| Hispanic                                    | 1.5%                                   | 1.7%               | 0.3%                     | 0.9%                 |
| American Indian                             | 0.3%                                   | 0.3%               | 0.5%                     | 0.2%                 |
| Races not known                             | 3.8%                                   | 4.5%               | 1.5%                     | 4.7%                 |
| <b>Remedial education and family income</b> |  |                    |                          |                      |
| Had received remedial education             | 16.9%                                  | 39.2%              | 36.1%                    | 17.3%                |
| Family Income (in 2008-09 prices)           | \$80,120                               | \$56,775           | \$61,410                 | \$73,998             |

Table 7 reveals a pattern similar to the one observed in table 6. Junior continuing students and transfers differ with respect to individual characteristics but such differences are the largest when community college transfers are concerned. Continuing students are different from students transferring from 4-year regional or main campuses but those differences are less substantial.

Similar to the observations for the sophomores, differences between the junior continuing students and the junior community college transfers are concentrated around age, family income, and the proportion of remedial education recipients.

#### **IV.B Comparison of graduation rates: Adjustments for individual characteristics**

Summary statistics presented in tables 6 and 7 reveal that individual characteristics differ between transfers and continuing students, especially when transfer students from community colleges are concerned. Because age, remedial education, and family income are correlated with academic success, it is possible that parts of the observed lower rates of graduation for transfer students are due to their specific individual characteristics. This section presents comparisons of average graduation rates after adjusting the rates to reflect the influences of student and (overall) institutional characteristics. The section also identifies factors that have the largest impacts on the differential rates of graduation.

The adjusted graduation rates are obtained using estimates from a logit model in which the binary outcome variable – 1 if the student graduates and 0 otherwise – is expressed as a function of the characteristics of the student, the influence of institutions, and most importantly, variables that indicate whether the student was a continuing student at a 4-year university or if she had transferred from a community college, an affiliated regional campus, or another 4-year university in the US. Among individual characteristics, the model includes variables indicating gender, ethnicity, age, family income, and remedial education.<sup>1</sup>

#### **Comparison of actual and adjusted graduation outcomes**

Table 8 reports differences between the actual and the adjusted rates of graduation for sophomore continuing students and sophomore community college transfers from the FY2003-04 cohort. Additional tables reporting similar differences for the FY2004-05, FY2006-07 and the FY2007-08 cohorts are available on request.

Column [2] of table 8 reports differences in the actual rates of graduation, derived by subtracting average graduation rates of sophomore transfer students from the same of sophomore continuing students. Column [3] of table 8 presents differences in graduation rates but after the rates have been adjusted to take account of the influences of individual and institutional characteristics. Table 9 reports similar differences between junior continuing students and junior transfer students from the FY2003-04 cohort.

Column [2] of table 8 shows that relative to sophomore continuing students at 4-year university main campuses, sophomore transfers from community colleges, 4-year regional campuses and other 4-year university main campuses graduated at 20.9, 13.6, and 6.9 percentage points lower rates, respectively. Column [3] of table 8, however, shows that the differences between the adjusted rates of graduation are considerably smaller: for community college transfers, the 20.9 point difference in actual rates in column [2] reduces to a difference of only 7.9 points in the adjusted rates in column [3], implying that differences in individual characteristics account for more than 60% of the observed difference in graduation rates between continuing students and the community college transfers.

Table 8 also shows that the difference in the actual rate of graduation for the 4-year regional college transfer declines from 13.6 points to a difference of 10.1 points in adjusted rates, and the difference in the actual rate of difference 6.9 points reduces to a difference of 6.0 points in adjusted rates for transfers from other 4-year main campuses. From the above, the reductions in the difference of graduation rates are the largest for the community college transfers. The finding is consistent with the observation that 4-year main campus continuing students and the community college transfer students are the most different with respect to the individual characteristics.

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<sup>1</sup> The logit model also explicitly accounts for clusters within institutions in the data.

**Table 8.** Differences between Actual and Adjusted Six-year Graduation Rates: 2003-04 Cohort Sophomores.

| [1]  | [2]  | [3]   |
|--|--|---|
|  | Actual graduation rate (continuing)<br>–<br>Actual graduation rate (transfers) | Adjusted graduation rate (continuing) –<br>Adjusted graduation rate (transfers) |
| <b>Results: Relative to sophomore continuing students at 4-year university main campuses</b> |  |   |
| <b>Transfers from 2-Year colleges</b>  | Graduated at 20.9 percentage points lower rate                                 | Graduated at 7.9 percentage points lower rate                                   |
| <b>Transfers from 4-Year regional campuses</b>   | Graduated at 13.6 percentage points lower rate                                 | Graduated at 10.1 percentage points lower rate                                  |
| <b>Transfers from 4-Year main campuses</b>   | Graduated at 6.9 percentage points lower rate                                  | Graduated at 6.0 percentage points lower rate                                   |

Table 9 presents differences in graduation rates – actual and adjusted – between junior continuing students and transfers. Column [2] of table 9 reports differences in actual graduation rates and column [3] reports differences in the adjusted rates.

**Table 9.** Differences between Actual and Adjusted Six-year Graduation Rates: 2003-04 Cohort Juniors.

| [1]   | [2]  | [3]   |
|---|--|---|
|   | Actual graduation rate (continuing)<br>–<br>Actual graduation rate (transfers) | Adjusted graduation rate (continuing) –<br>Adjusted graduation rate (transfers) |
| <b>Results: Relative to Junior continuing students at 4-year university main campuses</b> |  |   |
| <b>Transfers from 2-Year colleges</b>   | Graduated at 15.8 percentage points lower rate                                 | Graduated at 7.7 percentage points lower rate                                   |
| <b>Transfers from 4-Year regional campuses</b>  | Graduated at 8.6 percentage points lower rate                                  | Graduated at 5.0 percentage points lower rate                                   |
| <b>Transfers from 4-Year main campuses</b>  | Graduated at 14.9 percentage points lower rate                                 | Graduated at 11.4 percentage points lower rate                                  |

Table 9 shows that differences in the adjusted rates of graduation are smaller than the differences in the actual rates of graduation for juniors as well. Column [2] of table 9 shows that relative to junior continuing students at 4-year university main campuses, transfer students from community colleges, 4-year regional campuses, and other 4-year university main campuses graduated at 15.8, 8.6, and 14.9 point lower rates, respectively. Column [3] shows that for transfer students from community colleges, regional campuses, and other 4-year main campuses, the differences in adjusted rates drop to 7.7, 5.0, and 11.4 points, respectively.

#### **IV.C Student characteristics that matter the most**

The results from the previous section – tables 8 and 9 – show that the observed lower graduation rates for transfer students in rank-based matching with 4-year university main campus continuing students are due, to a large extent, to the specific characteristics of the transfer students.

The adjusted rates of graduation are obtained using estimates from a logit model of college graduation; these estimates reveal that graduation rates decline with the age of the student, and the recipients of remedial education graduate at lower rates. Moreover, higher levels of family income are related to higher rates of graduation, and male students graduate at lower rates relative to the female students, while Black, Asian, and students of Hispanic origins graduate at lower rates relative to White students.

We build on these estimates to ask the following counterfactual question: What would be the average rate of graduation for transfer students if they were similar to continuing students with respect to one or more characteristics? The answers to the question are obtained using a series of simulation exercises. This report presents the results only for the FY2003-04 cohort of community college transfer students.

First consider the simulation of graduation rates using one specific characteristic of the student: her age. The average age of the sophomore continuing student from the FY2003-04 cohort is 21.1 years. In contrast, community college transfer students from the same cohort were 23.4 year old on average. Now consider the counterfactual; if the sophomore community college transfer students were 21.1 year old on average – the average age for continuing students – what would be their average rate of graduation? Once the counterfactual (simulated) graduation rate is obtained, it is easy to show the contribution of students' age to their graduation rates by comparing the simulated rate of graduation to the actual rate of graduation. Similar exercises with family income, remedial education, race and gender would show the respective contributions of those variables.

The results from the simulations for sophomore community college transfers from the FY2003-04 cohort are presented in table 10. Row [1] of table 10 shows that age has a very strong association with the graduation outcome for sophomore community college transfer students; when the age of community college transfers is set equal to 21.3 years – the average age of continuing students – graduation rates for community college transfers increase from the actual value of 60.7% to the simulated value of 67.9% – a 7.2 point gain. From row [2] of table 10, family income has a positive influence on graduation outcomes; if the family income of sophomore community college transfer student was set equal to \$85,067 – the average income of sophomore continuing students – graduation rates for community college transfers would increase from the actual value of 60.7% to the simulated value of 63.2%, an increase of 2.5 points. Row [3] of table 10 shows the impact of remedial education; changing the proportion of remedial education recipients would cause the average graduation rate of community college transfers to increase from its actual value of 60.7% to the counterfactual value of 63.6%, an increase of 2.9 points. Rows [4] and [5] of table 3, however, show that students' race and gender had negligible influence on the lower graduation rates for transfer students.

**Table 10.** What if 2-Year College Transfer Students Looked Like Continuing 4-Year University Main Campus Students? Actual and Simulated Graduation Rates of Sophomores: 2003-04 Cohort.

| <b>[1]: Variable used in simulation: Age</b>  |  |  |                           |
|---|--|--|---------------------------|
| What values are used?   | Actual age of community college transfers: 23.4 years                    | Average age of continuing 4-year university students of 21.1 years       | Gain in graduation rates? |
| Graduation rates?   | 60.7%<br>Actual graduation rate  | 67.9%<br>Simulated graduation rate                                       | 7.2 points                |
| <b>[2]: Variable in simulation: Actual average family income (in 2009 constant price)</b> |  |  |                           |
| What values are used?   | Average family income of community college transfers: \$63,213           | Average family income of continuing 4-year university students: \$85,067 | Gain in graduation rates? |
| Graduation rates?   | 60.7%<br>Actual graduation rate  | 63.2%<br>Simulated graduation rate                                       | 2.5 points                |
| <b>[3]: Variable in simulation: Proportion receiving remedial education</b>               |  |  |                           |
| What values are used?   | Proportion of community college transfers with remedial education: 52.3% | Proportion of continuing students with remedial education: 19.2%         | Gain in graduation rates? |
| Graduation rates?   | 60.7%<br>Actual graduation rate  | 63.6%<br>Simulated graduation rate                                       | 2.9 points                |
| <b>[4]: Variable in simulation: Gender – proportion of male students</b>                  |  |  |                           |
| What values are used?   | Male student proportion among community college transfers: 51.1%         | Male student proportion among continuing students: 46.6%                 | Gain in graduation rates? |
| Graduation rates?   | 60.7%<br>Actual graduation rate  | 61.1%<br>Simulated graduation rate                                       | 0.4 points                |
| <b>[5]: Variable in simulation: Ethnicity – proportion of black students</b>              |  |  |                           |
| What values are used?   | Black student proportion among community college transfers: 10.3%        | Black student proportion among continuing students: 9.0%                 | Gain in graduation rates? |
| Graduation rates?   | 60.7%<br>Actual graduation rate  | 60.9%<br>Simulated graduation rate                                       | 0.2 points                |

Table 11 presents results from simulation exercises for the junior community college transfer students. Similar to the findings in table 10, students' age and family income continue to be the most important contributors to the lower rates of graduation for the community college transfer students. Changing the age of the student reveals a gain of 5.4 points; similarly, increasing the family income of the student leads to a 1.9 point gain in graduation rates. Gender and race continue to have negligible contributions to the lower rate of graduation for transfers from community colleges. In contrast to the findings for

sophomores, remedial education does not contribute in a large way to the lower rate of graduation for the junior transfer students from community colleges.

**Table 11.** What if 2-Year College Transfer Students Looked Like Continuing 4-Year University Main Campus Students? Actual and Simulated Graduation Rates of Juniors: 2003-04 Cohort.

| <b>[1]: Variable used in simulation: Age</b>  |  |  |                           |
|---|--|--|---------------------------|
| What values are used?   | Average age of community college transfers: 25.0 years                   | Average age of continuing 4-year university students of 22.1 years       | Gain in graduation rates? |
| Graduation rates?   | 75.7%<br>Actual graduation rate  | 81.1%<br>Simulated graduation rate                                       | 5.4 points                |
| <b>[2]: Variable in simulation: Actual average family income (in 2009 constant price)</b> |  |  |                           |
| What values are used?   | Average family income of community college transfers: \$56,775           | Average family income of continuing 4-year university students: \$80,120 | Gain in graduation rates? |
| Graduation rates?   | 75.7%<br>Actual graduation rate  | 77.6%<br>Simulated graduation rate                                       | 1.9 points                |
| <b>[3]: Variable in simulation: Proportion receiving remedial education</b>               |  |  |                           |
| What values are used?   | Proportion of community college transfers with remedial education: 39.2% | Proportion of continuing students with remedial education – 16.9%        | Gain in graduation rates? |
| Graduation rates?   | 75.7%<br>Actual graduation rate  | 76.6%<br>Simulated graduation rate                                       | 0.9 points                |
| <b>[4]: Variable in simulation: Gender – proportion of male students</b>                  |  |  |                           |
| What values are used?   | Male student proportion among community college transfers: 48.8%         | Male student proportion among continuing students: 45.8%                 | Gain in graduation rates? |
| Graduation rates?   | 75.7%<br>Actual graduation rate  | 76.1%<br>Simulated graduation rate                                       | 0.4 points                |
| <b>[5]: Variable in simulation: Ethnicity – proportion of black students</b>              |  |  |                           |
| What values are used?   | Black student proportion among community college transfers: 10.0%        | Black student proportion among continuing students: 6.9%                 | Gain in graduation rates? |
| Graduation rates?   | 75.7%<br>Actual graduation rate  | 76.2%<br>Simulated graduation rate                                       | 0.5 points                |

In light of the strong association between students' age and their graduation outcomes, it is necessary to look for explanations of why older students graduate at lower rates. An explanation of the age-graduation association begins with the understanding of what causes community college transfers to be older. A student is older if she had delayed entry to college after completing high school or if her initial post-enrollment attendance has been characterized with one or more interruptions. Both delayed

entrance and interrupted attendance patterns are associated with lower academic success. As such, struggles with academic requirements, financial constraints, and lowered expectations of post-graduation financial gains may prevent older students from continuing their pursuits of a college degree.

The results on the contribution of remedial education are also informative. Simulation exercises in table 10 show that having a lower proportion of remedial education recipients among the sophomore transfers results in a higher rate of graduation. However, simulation exercises for the junior community college transfers – reported in table 11 – show that a lowering of remedial education proportions has only a negligible influence on graduation rates. These results imply that graduation outcomes of community college transfer students are influenced by their (lack of) academic preparation, as indicated by the impact of remedial education. However, once transfer students persist in college long enough to progress to the rank of junior, remedial education received in pre-transfer years are less of a concern with respect to subsequent graduation outcomes.

### **Section V. Impact of TAG on graduation Rates**

The Transfer Assurance Guide (TAG) is an initiative of the Ohio Board of Regents, implemented in FY2005-06. TAG guarantees that credits received in approved equivalent courses transfer and meet pre-major and beginning-major requirements in the receiving institutions, allowing students to transfer a core of courses counting toward the major program. The foundation of the TAG-transfer guarantee is the equivalency of learning outcomes of approved equivalent courses in institutions in the system. TAG-approved beginning-major and pre-major courses are approved by panels consisting of faculties from USO institutions.

Although the statewide guarantee under TAG is likely to help students save time and money, there are concerns regarding whether TAG may have an adverse effect on the academic outcomes of transfer students. The argument goes in the following way: learning outcomes of TAG approved courses are not the same in all institutions in the state. Consequently, although transfer students receive credit for completed TAG-approved courses, some of them may not be able to master the content of the courses. As a result, their subsequent academic outcomes would be adversely affected. TAG, therefore, could have an adverse impact on the graduation rates of transfer students.

This report examines the validity of the claim by estimating the impact of TAG on graduation rates of transfer students. If learning outcomes of TAG approved courses are the same in different institutions, then TAG would not influence graduation rates of transfer students. However, if the learning outcomes are not really equivalent, then TAG would have an adverse impact on the graduation rates of students transferring to academically more demanding institutions, especially the 4-year university main campuses.

This report uses data from cohorts of students from FY2003-04 and FY2004-05, both from before the implementation of TAG, and on cohorts from FY2006-07 and FY2007-08, after the implementation of TAG, to estimate the impact of TAG on graduation rates of transfer students.

The methodology for estimating the impact of TAG is commonly known as the difference-in-difference estimator. TAG impacts are quantified in the following manner. First a before-and-after comparison of graduation rates for the transfer students shows the impact of TAG and the influence of changes in the other determinants (not related to TAG) of graduation outcomes. Similarly, a before-and-after comparison of graduation rates for continuing students reveals only the influence of changes in the other determinants of TAG because the continuing students, by definition, are not exposed to TAG. When the two differences are compared, the influence of the other factors is netted out, yielding the impact of TAG. The methodology is described in table 12 and the estimated impacts of TAG for the sophomore and junior transfers are presented in tables 13 and 14, respectively.

**Table 12.** The Structure of the Difference-in-Difference Estimator

| Groups of students                                  | Graduation Rates                       |                                       | Difference in Graduation Rates                      |
|---|--|---------------------------------------|---|
|   | Before TAG                             | After TAG                             |   |
|   | Cohorts : FY2003-04 & FY2004-05        | Cohorts : FY2006-07 & FY2007-08       |   |
| Transfer students (TAG beneficiaries)               | Graduation Rate<br>$GR_{(Before TAG)}$ | Graduation Rate<br>$GR_{(After TAG)}$ | <b>X:</b><br>$GR_{(Before TAG)} - GR_{(After TAG)}$ |
| Continuing students (Control group)                 | Graduation Rate<br>$GR_{(Before TAG)}$ | Graduation Rate<br>$GR_{(After TAG)}$ | <b>Y:</b><br>$GR_{(Before TAG)} - GR_{(After TAG)}$ |
| Difference-in-Difference estimator (Impact of TAG ) |  |                                       | <b>X – Y</b>  |

**Table 13.** Estimated Impact of the Transfer Assurance Guide (TAG) on Graduation Rates of Sophomore Transfer Students from Community Colleges.

| Groups of students                                  | Graduation Rates                |                                 | Difference in Graduation Rates   |
|---|---------------------------------|---------------------------------|--|
|   | Before TAG                      | After TAG                       |  |
|   | Cohorts : FY2003-04 & FY2004-05 | Cohorts : FY2006-07 & FY2007-08 |  |
| Transfer students (TAG beneficiaries)               | 61.1%                           | 63.8%                           | <b>X:</b><br>63.8- 61.1=2.7 points                                       |
| Continuing students (Control group)                 | 81.3%                           | 82.4%                           | <b>Y:</b><br>82.4- 81.3=1.1 points                                       |
| Difference-in-Difference estimator (Impact of TAG ) |                                 |                                 | <b>X – Y:</b><br>2.7 – 1.1 = 1.6 points<br>(Statistically Insignificant) |

Table 13 shows that graduation rates of transfer students increased moderately, by 2.7 points, after the implementation of TAG. The increase in graduation rate is due to any impact of TAG and to the influences of other determinants of graduation outcomes that changed after TAG. Table 13 shows that graduation rates of continuing students also increased after TAG, by 1.1 points. The 1.1 point increase represents the influence of changes in other factors. When the two increases are compared, TAG appears to have increased the average rate of graduation of sophomore community college transfer students by 1.6 points. However, the estimated value of the impact is small and also statistically insignificant, meaning that TAG did not have an influence on the graduation rates of sophomore transfer students from community colleges. Table 14 shows a similar picture for the junior transfer students; TAG did not influence graduation rates of the junior transfer students from community colleges.

The estimated impacts of TAG are found to be small and statistically insignificant for both sophomore and junior transfers from 4-year university main campuses as well; the estimates are available on request. The report does not estimate the impact of TAG for 4-year regional campus transfers because those students had guarantees of credit transfer from their affiliated main campuses even before the implementation of TAG.

**Table 14.** Estimated Impact of the Transfer Assurance Guide (TAG) on Graduation Rates of Junior Transfer Students from Community Colleges.

| Groups of students                                  | Graduation Rates                |                                 | Difference in Graduation Rates   |
|---|---------------------------------|---------------------------------|--|
|   | Before TAG                      | After TAG                       |  |
|   | Cohorts : FY2003-04 & FY2004-05 | Cohorts : FY2006-07 & FY2007-08 |  |
| Transfer students (TAG beneficiaries)               | 76.0%                           | 76.4%                           | <b>X:</b><br>76.4- 76.0=0.4 points                                       |
| Continuing students (Control group)                 | 90.8%                           | 91.1%                           | <b>Y:</b><br>91.1- 90.8=0.3 points                                       |
| Difference-in-Difference estimator (Impact of TAG ) |                                 |                                 | <b>X – Y:</b><br>0.4 – 0.3 = 0.1 points<br>(Statistically Insignificant) |

### Section VI. Concluding remarks

This report compares graduation rates between continuing students and transfers in the University System of Ohio. Given large differences in the demographic, economic, and academic characteristics between the two groups, the report extends the analyses by comparing graduation rates after adjustments for the influence of individual characteristics. The report also shows which of the individual characteristics have larger influences on graduation rates for transfer students. Finally, the report presents estimated impacts of the Transfer Assurance Guide (TAG), a key transfer initiative of the Ohio Board of Regents.

The results show that when compared to a freshman cohort at 4-year universities, transfer students graduate at higher rates. However, when transfers and continuing students are matched by rank – sophomores with sophomores and juniors with juniors – transfer students graduate at lower rates. The apparent contradiction in the results follows from the particular definitions used in the comparisons.

The report finds that the large difference in graduation rates between continuing students and transfers, observed when matched by rank, are due mostly to the differences between the two groups in their individual characteristics. Transfer students from especially community college are less affluent, older, and with a higher proportion of remedial education recipients among them. These factors, especially age and family income are found to have large influences on the differential graduation rates.

Finally, the report finds that the Transfer Assurance Guide (TAG) did not influence graduation rates of transfer students. The no-impact result is consistent with the underlying premise of the Transfer Assurance Guide: Learning outcomes of TAG-approved courses in different institutions are the same. When learning outcomes of TAG-approved courses are the same, students transferring between institutions are expected to have similar academic preparations whether they receive credit for TAG-approved courses or complete the course at the receiving institution. Consequently, academic outcomes including graduation rates are not affected but students are able to enjoy the benefits of TAG, namely increased potentials for saving time and money.