Houston Christian University

Longitudinal Report

Inbound
158
107
80

Outbound
46
58
55

Assessment Periods:

June 1, 2022 - May 31, 2023
June 1, 2023 - May 31, 2024
June 1, 2024 - May 31, 2025

Academic Level/Assessment Solution:

Masters Business Administration

Aggregates:

AACSB Accredited - The Association to Advance Collegiate Schools of Business

ACBSP Region 6 (Southwestern Council)

Faith-based Institution

Southern Association of Colleges and Schools Commission on Colleges

PEREGRINE GLOBAL SERVICES

Data Included in Report

Programs

- MBA, n=410
- Masters in Human Resource Management, n=94

Longitudinal Report — Houston Christian University

Description of the report:

The Longitudinal Analysis Report is a side-by-side comparison of the same exam over different exam periods. Up to five exam periods can be shown on the report. The report is most often used to evaluate academic change and to understand the trends over time. Examples include comparing an exam period before a change was made with the exam results after the change was made. Understanding the effects of change leads to continuous quality improvement. The report is also used to help satisfy accreditation requirements associated with the number of data points to report.

Prepared By:

Peregrine Global Services

640 North Highway 14-16

Gillette, WY 82716

Phone: +1 (307) 685-1555

Email: ClientServices@PeregrineGlobal.com

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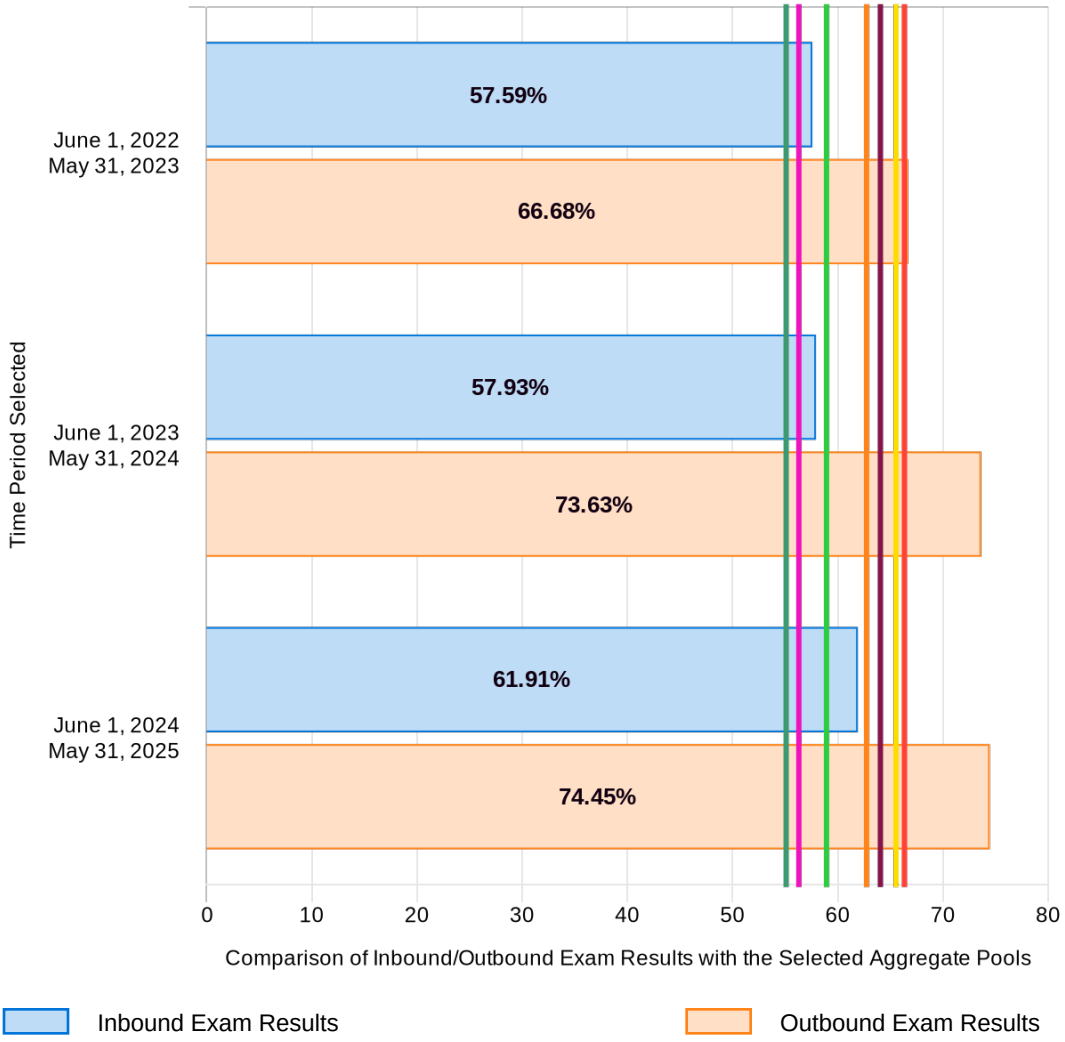
Table of Contents

Data Included in Report	ii
Description of the Report	iii
Table Of Contents	iv
Total	1
Accounting	3
Business Communications	5
Business Ethics	7
Business Finance	9
Business Integration and Strategic Management	11
Business Leadership	13
Economics	15
Economics: Macroeconomics	17
Economics: Microeconomics	19
Global Dimensions of Business	21
HRM Advanced Topic I	23
HRM Advanced Topic II	25
HRM Advanced Topic III	27
HRM Advanced Topic IV	29
Management	31
Management: Human Resource Management	33
Management: Operations/Production Management	35
Management: Organizational Behavior	37
Marketing	39
Quantitative Research Techniques and Statistics	41
How to Read and Understand the Longitudinal Report	43
Best Practices	45
Validity and Reliability	46
Glossary of Terms	48

Longitudinal Report — Houston Christian University

Masters Business Administration

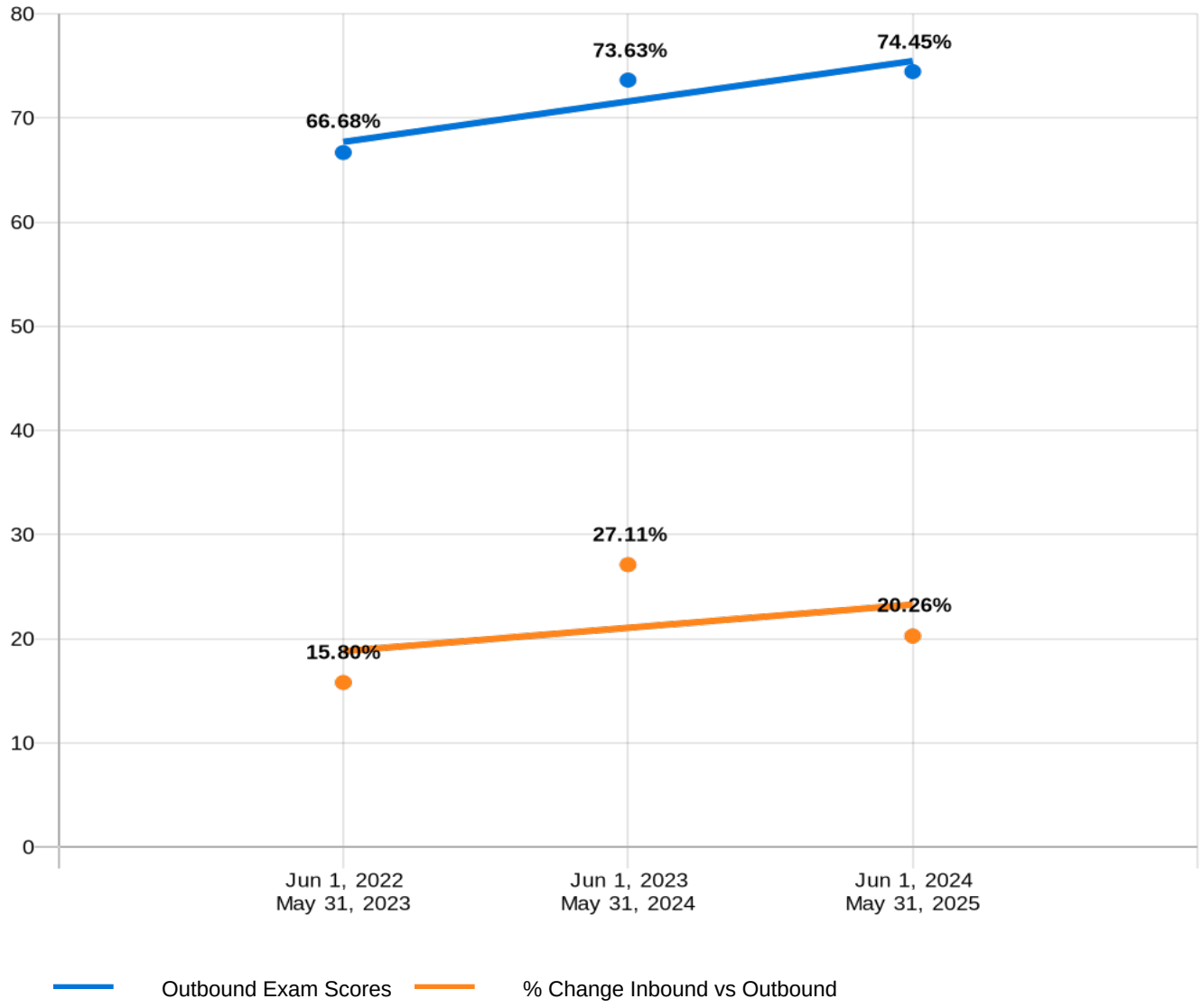
Longitudinal Comparison: Total



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	62.73%
ACBSP Region 6 (Southwestern Council)	58.93%	66.34%
Faith-based Institution	56.30%	64.05%
Southern Association of Colleges and Schools Commission on Colleges	55.09%	65.53%

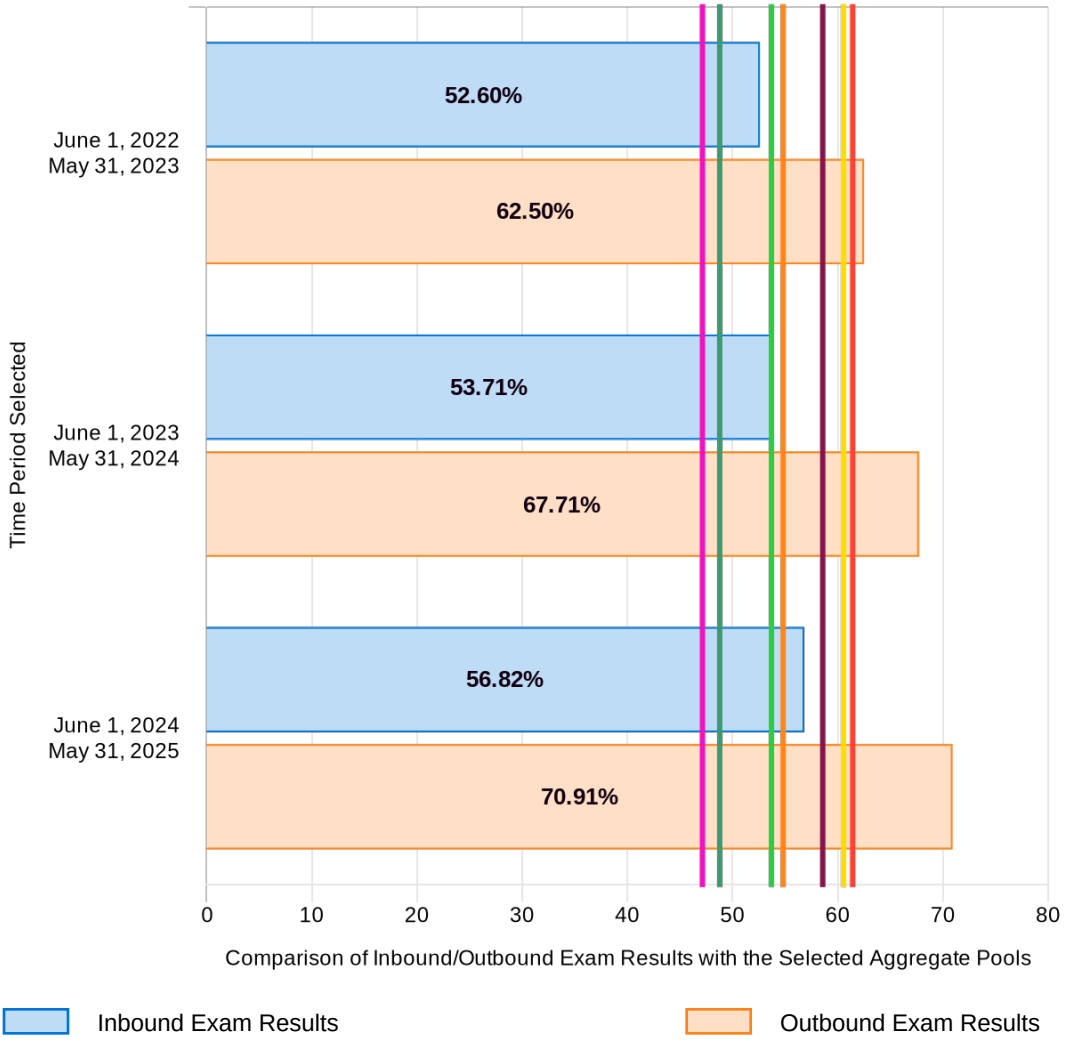
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	9.10	15.80%
Jun 1, 2023 - May 31, 2024	107	58	15.70	27.11%
Jun 1, 2024 - May 31, 2025	80	55	12.54	20.26%

Regression Analysis: Total



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.83
% Change Inbound vs Outbound	0.15

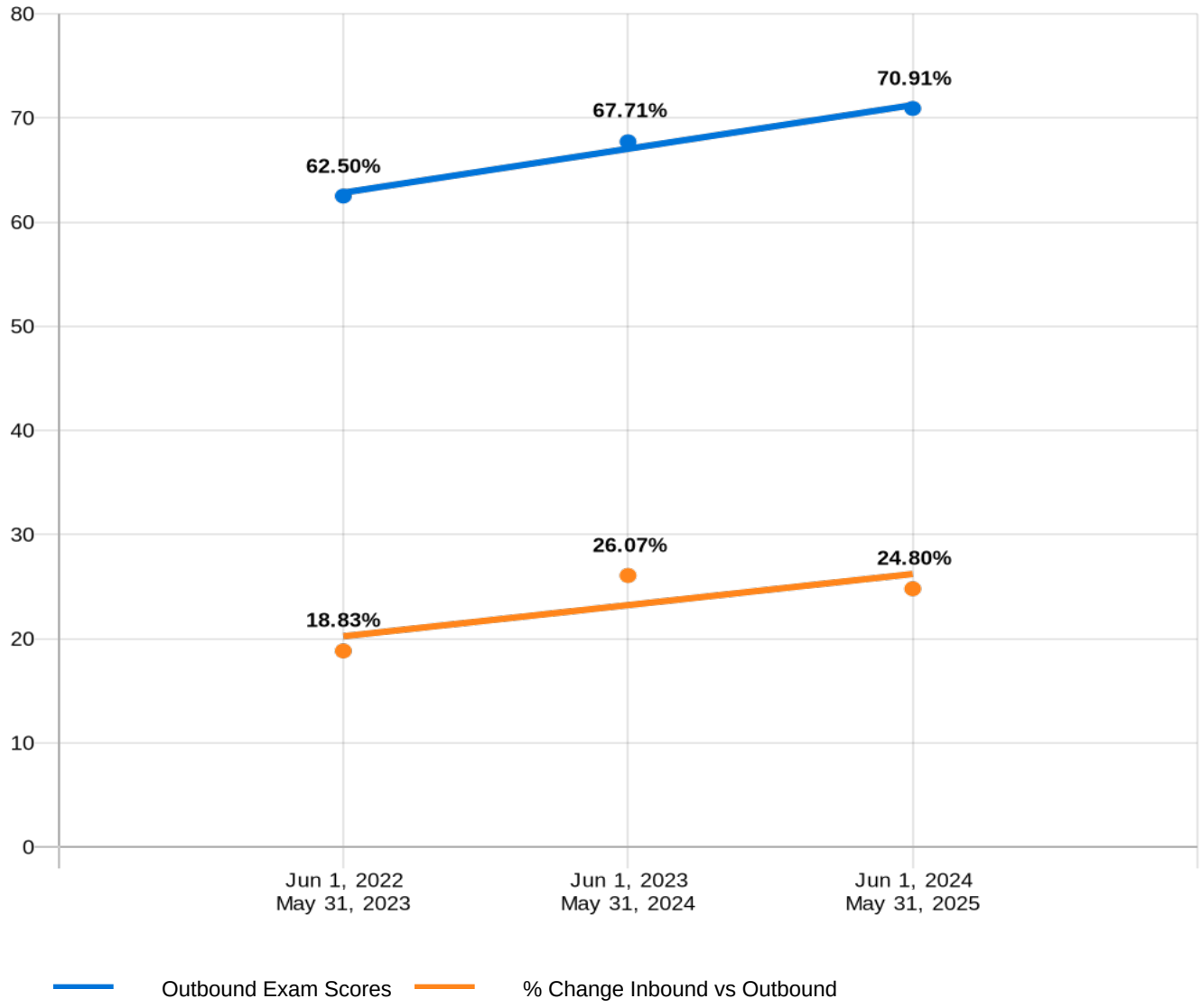
Longitudinal Comparison: Accounting



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	54.81%
ACBSP Region 6 (Southwestern Council)	53.70%	61.42%
Faith-based Institution	47.14%	58.57%
Southern Association of Colleges and Schools Commission on Colleges	48.78%	60.56%

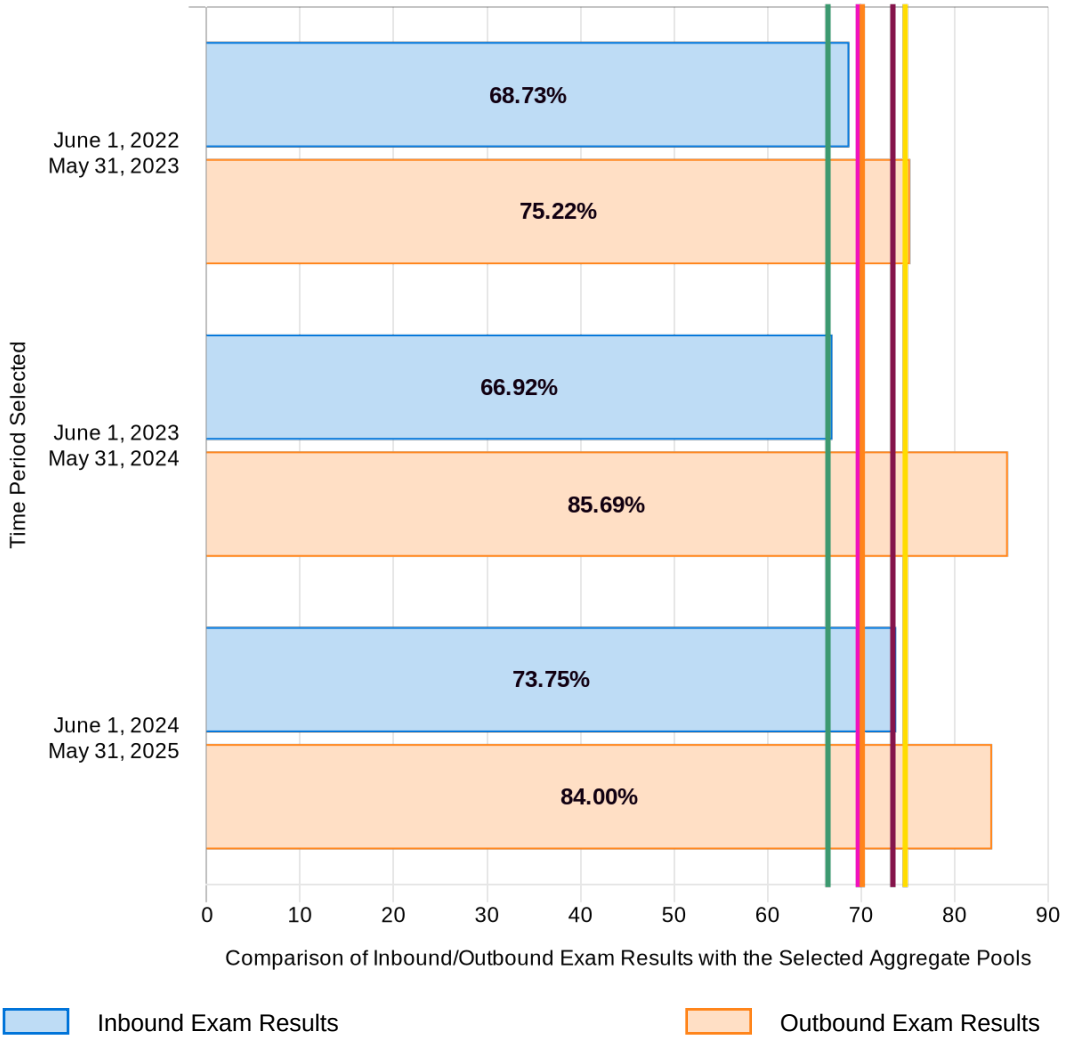
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	9.90	18.83%
Jun 1, 2023 - May 31, 2024	107	58	14.00	26.07%
Jun 1, 2024 - May 31, 2025	80	55	14.09	24.80%

Regression Analysis: Accounting



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.98
% Change Inbound vs Outbound	0.60

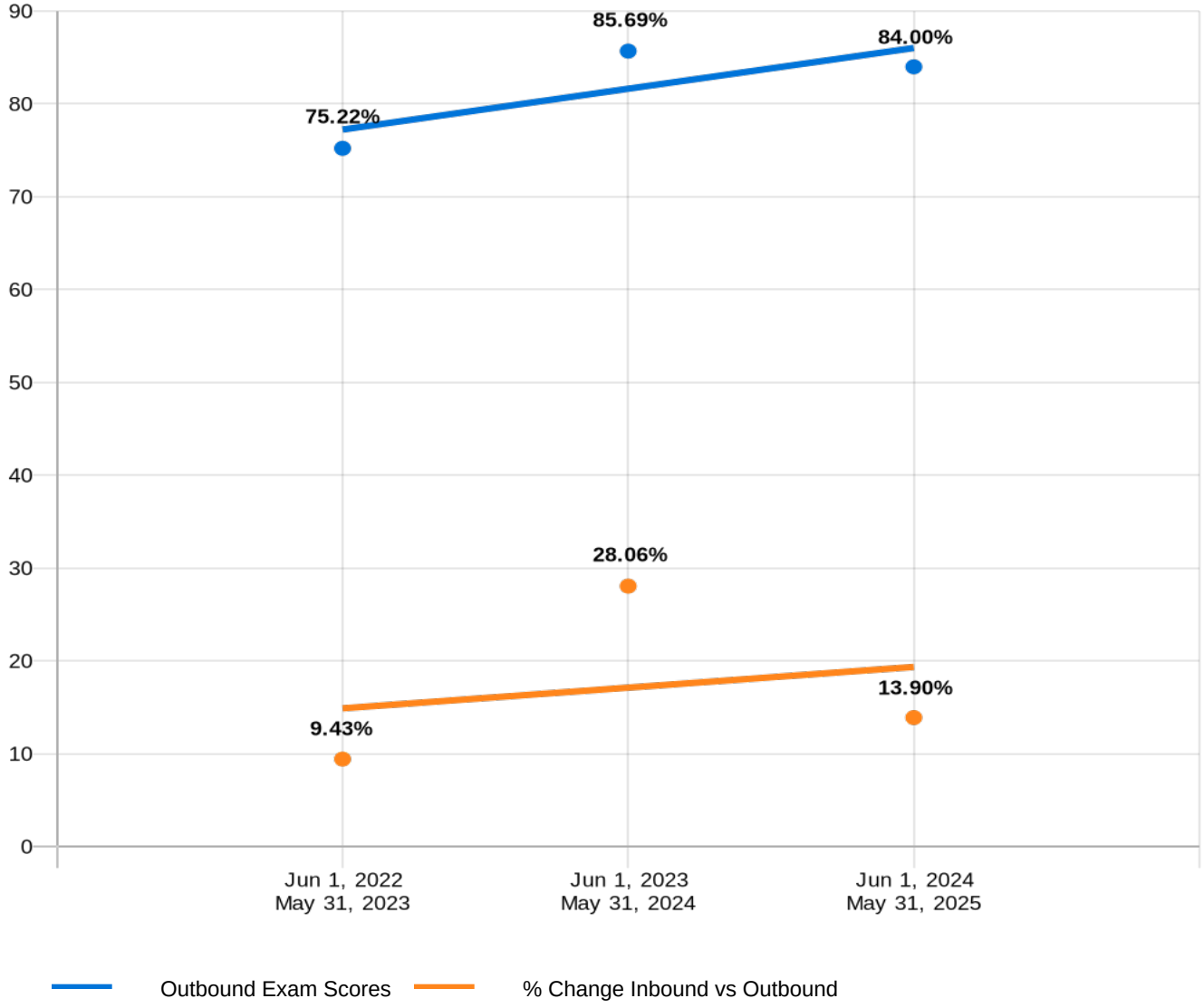
Longitudinal Comparison: Business Communications



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	70.12%
ACBSP Region 6 (Southwestern Council)	N/A	N/A
Faith-based Institution	69.69%	73.39%
Southern Association of Colleges and Schools Commission on Colleges	66.45%	74.71%

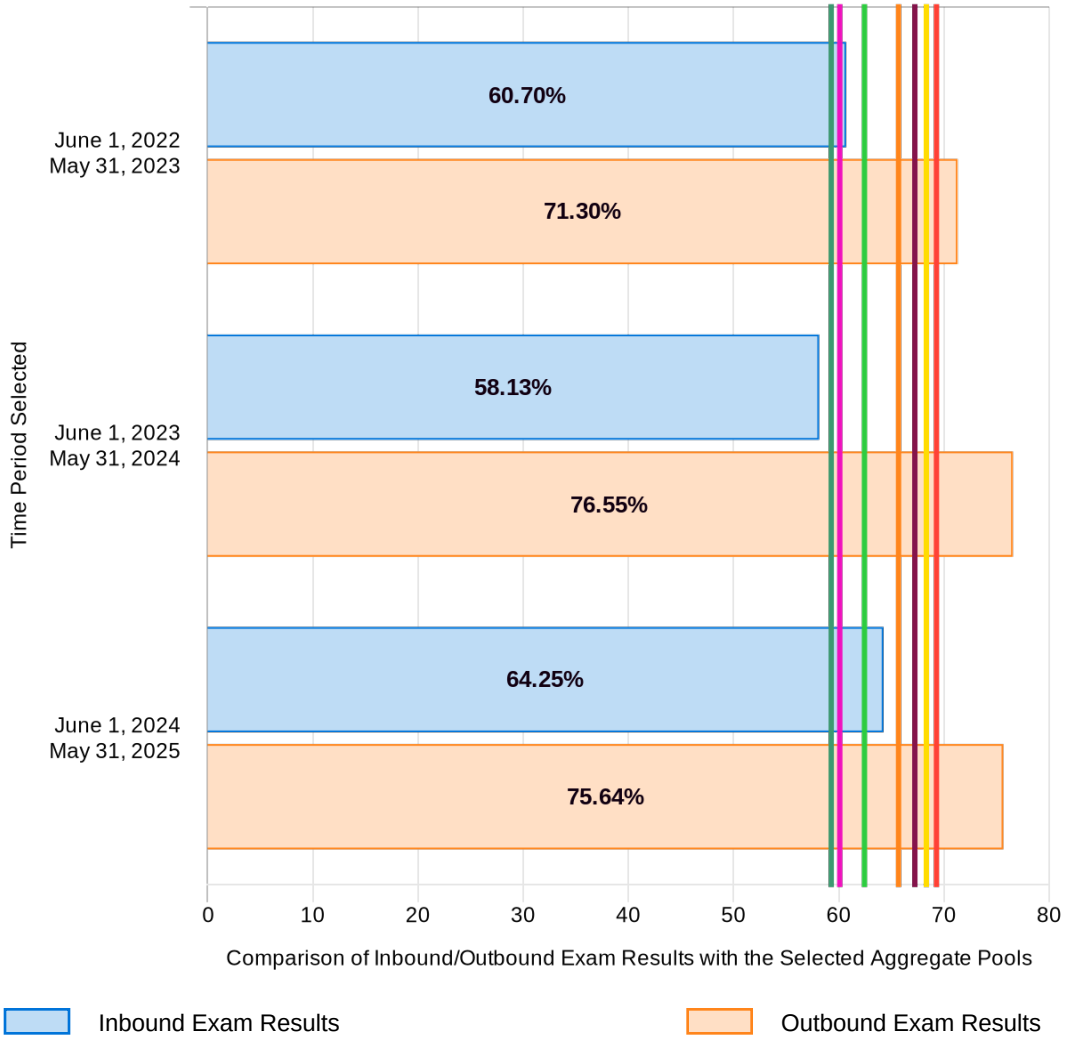
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	6.48	9.43%
Jun 1, 2023 - May 31, 2024	107	58	18.77	28.06%
Jun 1, 2024 - May 31, 2025	80	55	10.25	13.90%

Regression Analysis: Business Communications



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.61
% Change Inbound vs Outbound	0.05

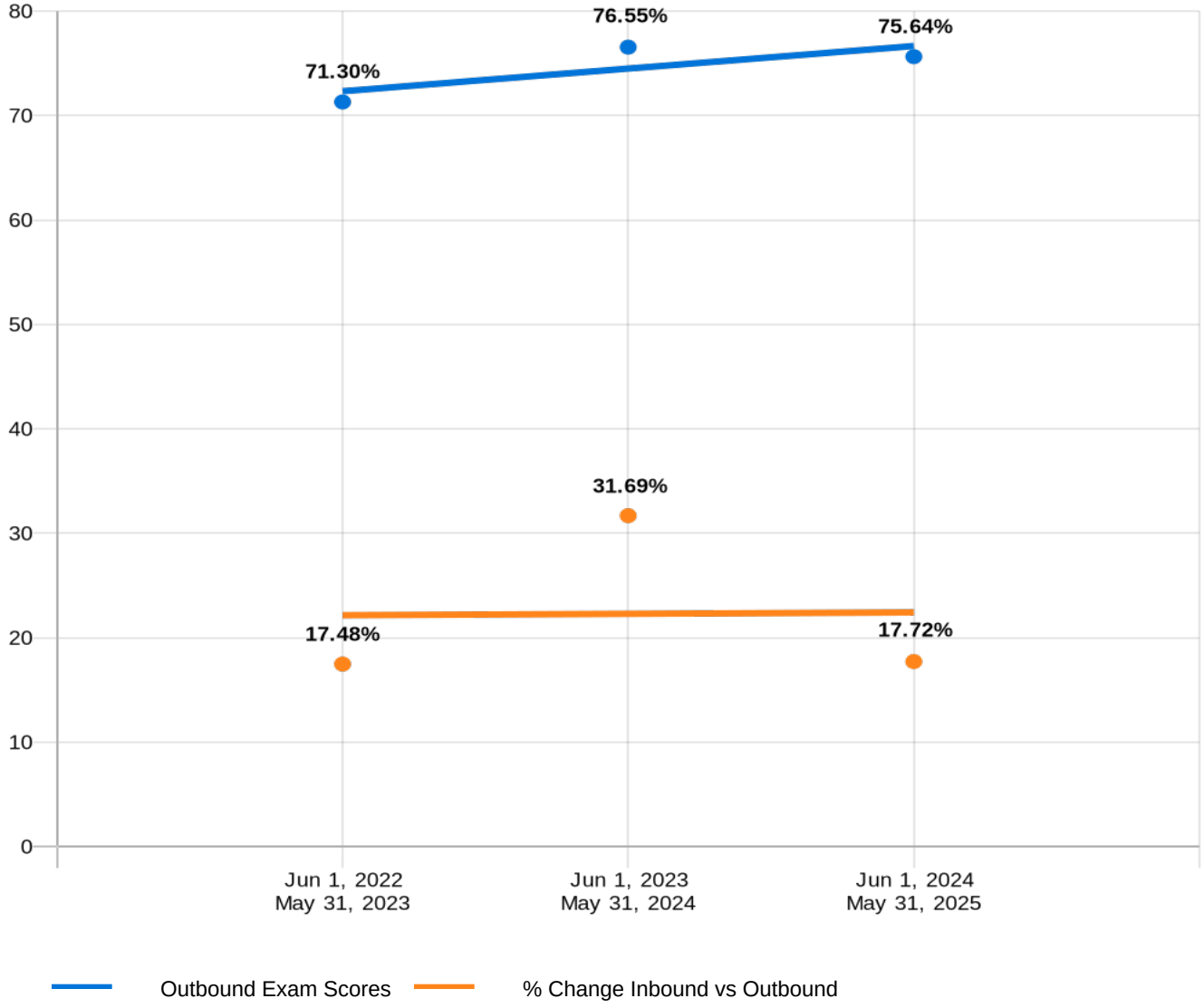
Longitudinal Comparison: Business Ethics



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	65.68%
ACBSP Region 6 (Southwestern Council)	62.44%	69.28%
Faith-based Institution	60.10%	67.23%
Southern Association of Colleges and Schools Commission on Colleges	59.28%	68.32%

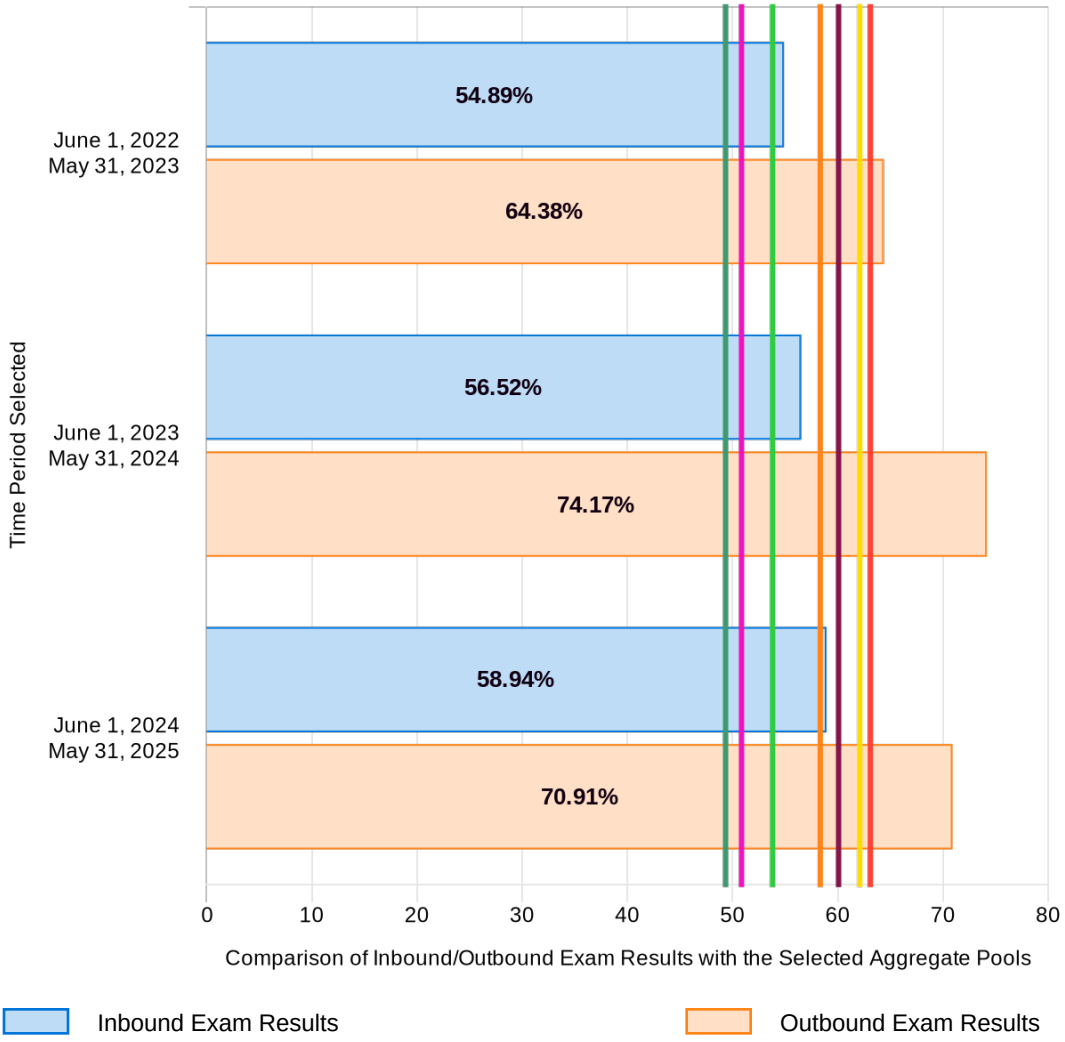
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	10.61	17.48%
Jun 1, 2023 - May 31, 2024	107	58	18.42	31.69%
Jun 1, 2024 - May 31, 2025	80	55	11.39	17.72%

Regression Analysis: Business Ethics



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.60
% Change Inbound vs Outbound	0.00

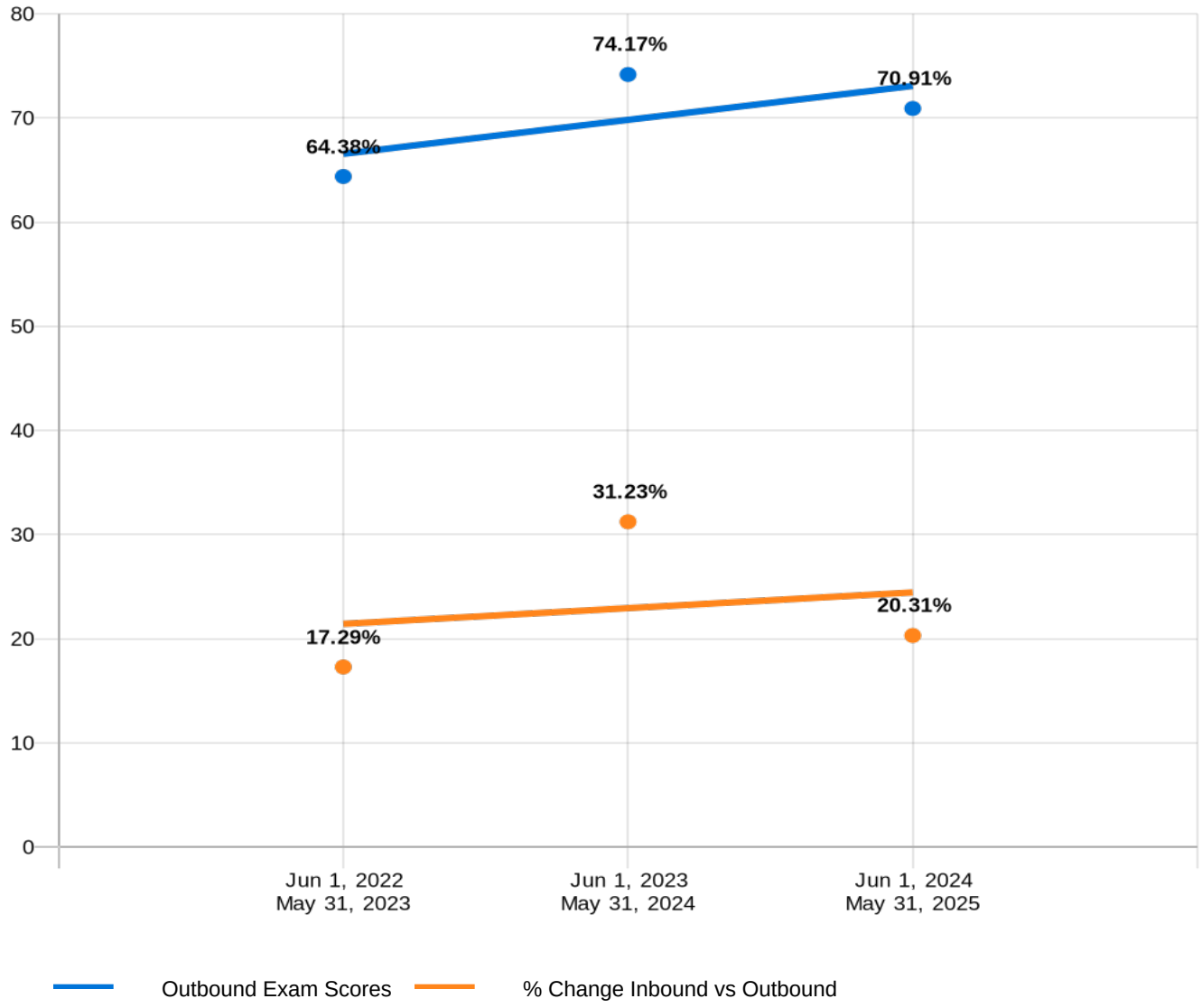
Longitudinal Comparison: Business Finance



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	58.33%
ACBSP Region 6 (Southwestern Council)	53.81%	63.10%
Faith-based Institution	50.85%	60.08%
Southern Association of Colleges and Schools Commission on Colleges	49.34%	62.09%

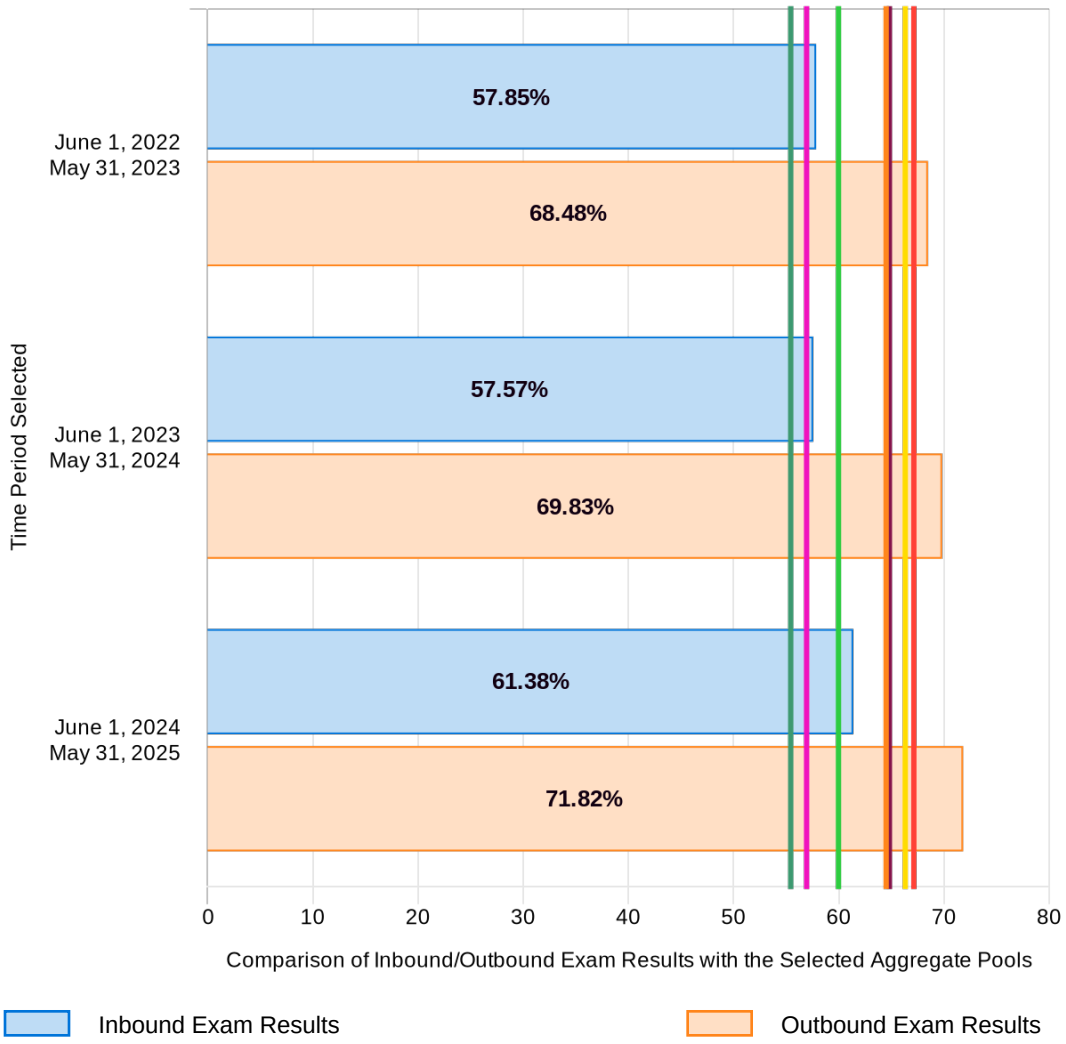
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	9.49	17.29%
Jun 1, 2023 - May 31, 2024	107	58	17.65	31.23%
Jun 1, 2024 - May 31, 2025	80	55	11.97	20.31%

Regression Analysis: Business Finance



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.43
% Change Inbound vs Outbound	0.04

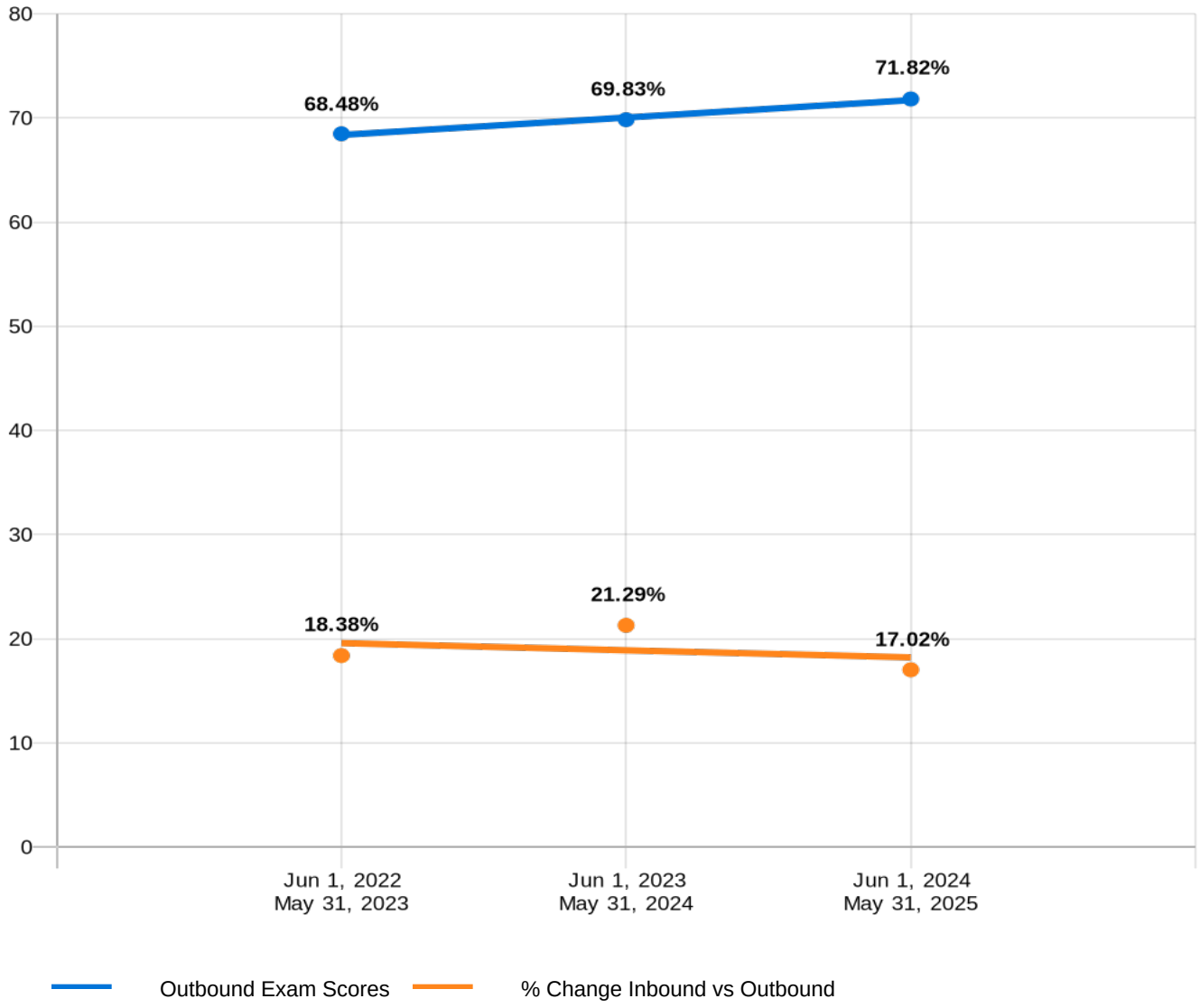
Longitudinal Comparison: Business Integration and Strategic Management



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	64.50%
ACBSP Region 6 (Southwestern Council)	59.97%	67.14%
Faith-based Institution	56.94%	64.81%
Southern Association of Colleges and Schools Commission on Colleges	55.43%	66.32%

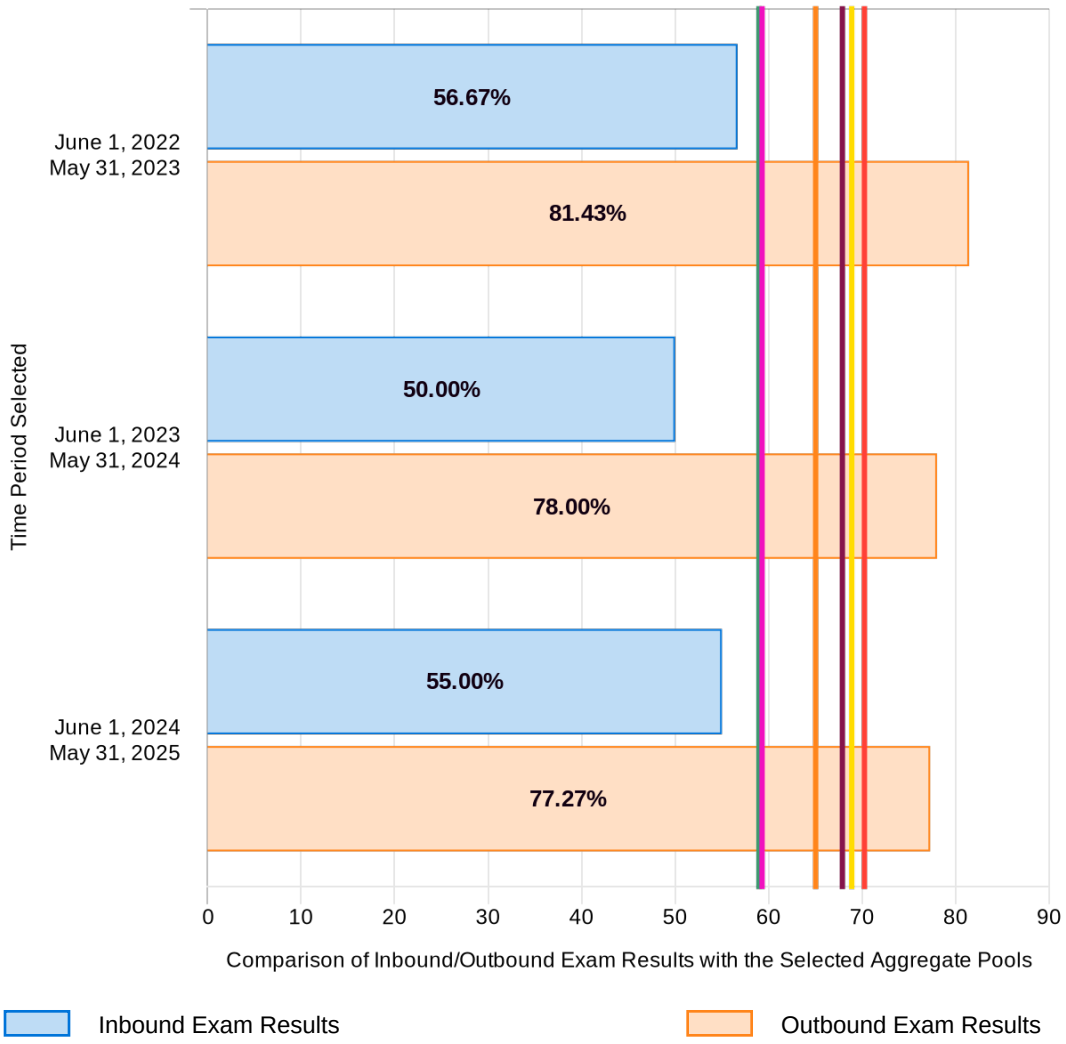
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	10.63	18.38%
Jun 1, 2023 - May 31, 2024	107	58	12.26	21.29%
Jun 1, 2024 - May 31, 2025	80	55	10.44	17.02%

Regression Analysis: Business Integration and Strategic Management



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.99
% Change Inbound vs Outbound	0.10

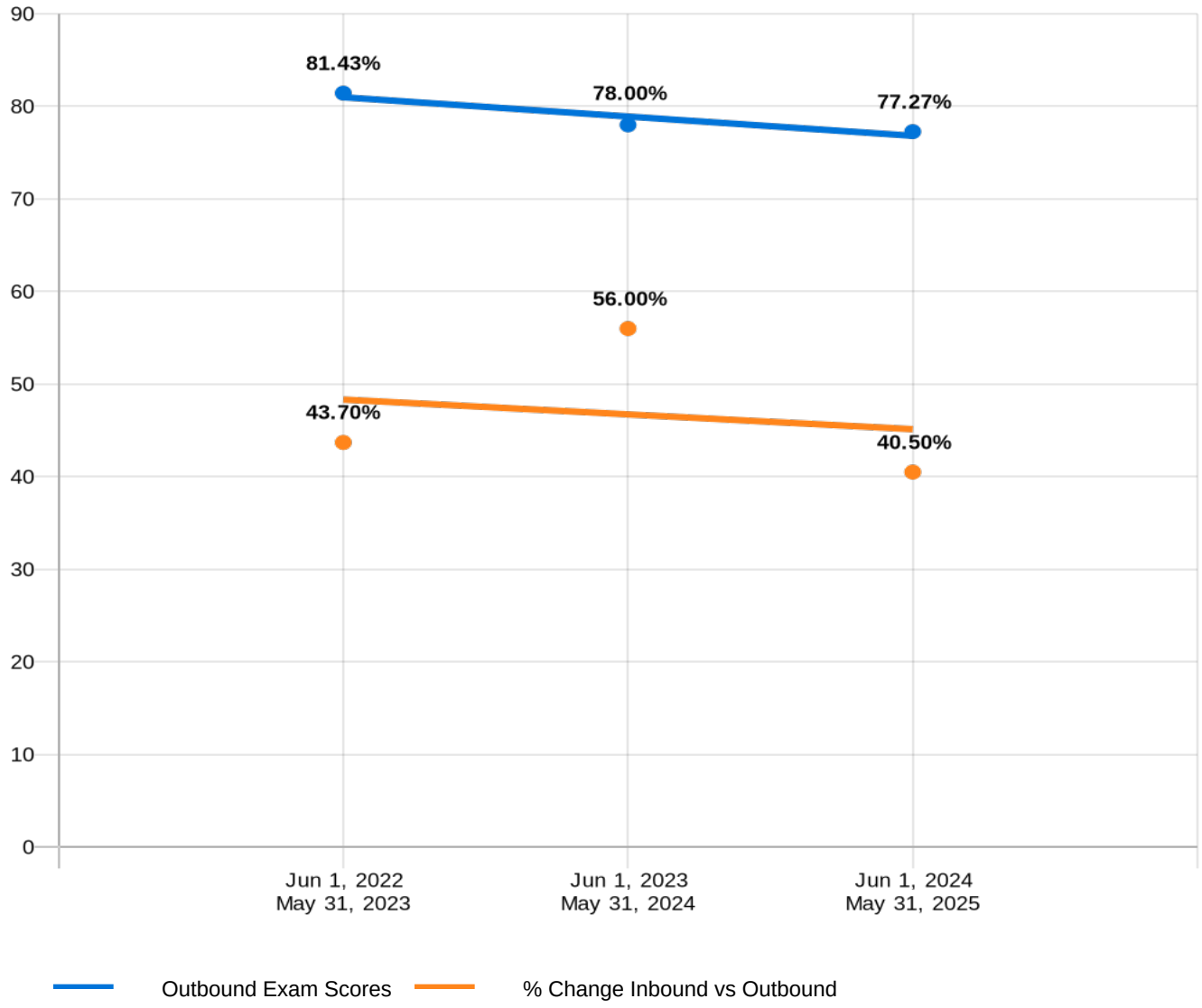
Longitudinal Comparison: Business Leadership



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	65.03%
ACBSP Region 6 (Southwestern Council)	N/A	70.24%
Faith-based Institution	59.30%	67.89%
Southern Association of Colleges and Schools Commission on Colleges	58.96%	68.89%

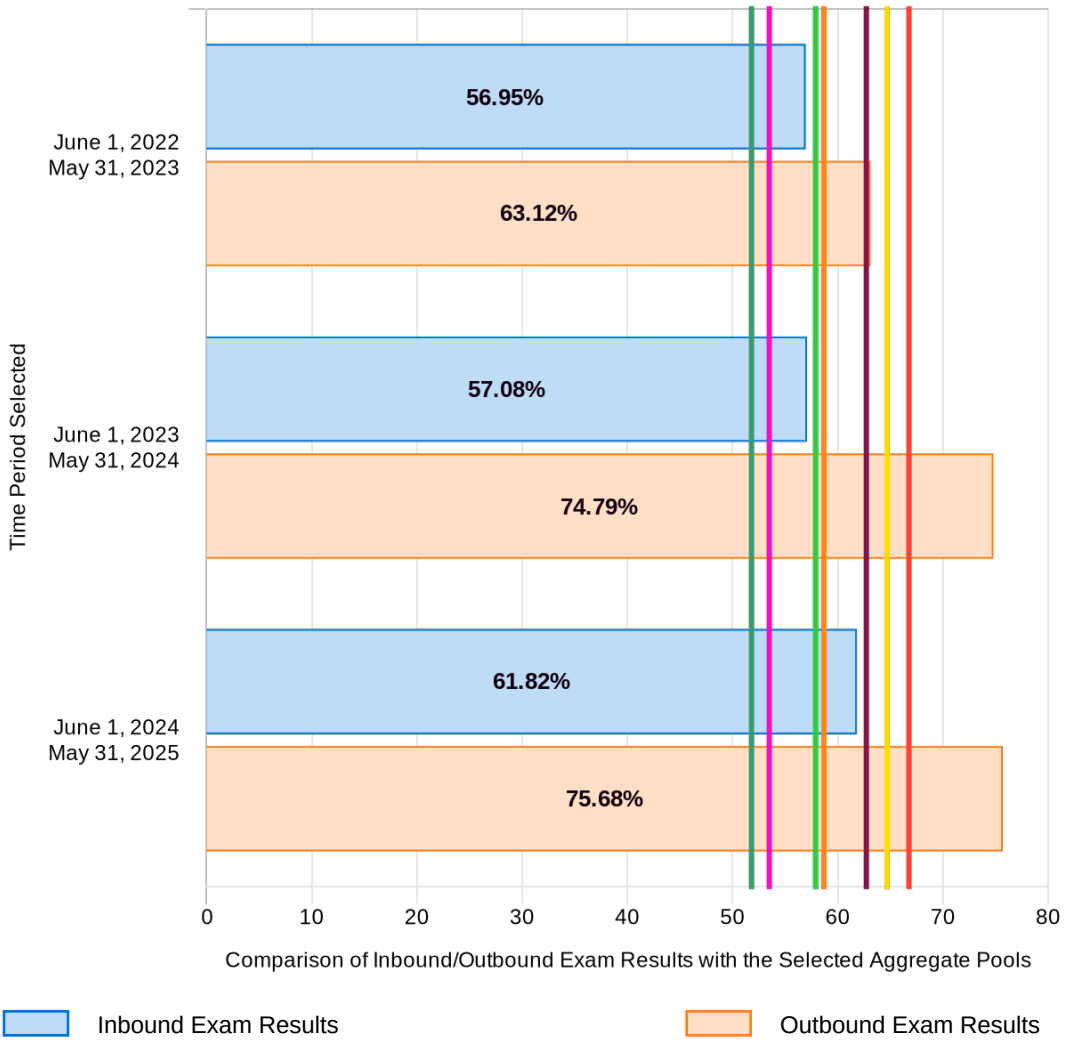
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	24.76	43.70%
Jun 1, 2023 - May 31, 2024	107	58	28.00	56.00%
Jun 1, 2024 - May 31, 2025	80	55	22.27	40.50%

Regression Analysis: Business Leadership



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.88
% Change Inbound vs Outbound	0.04

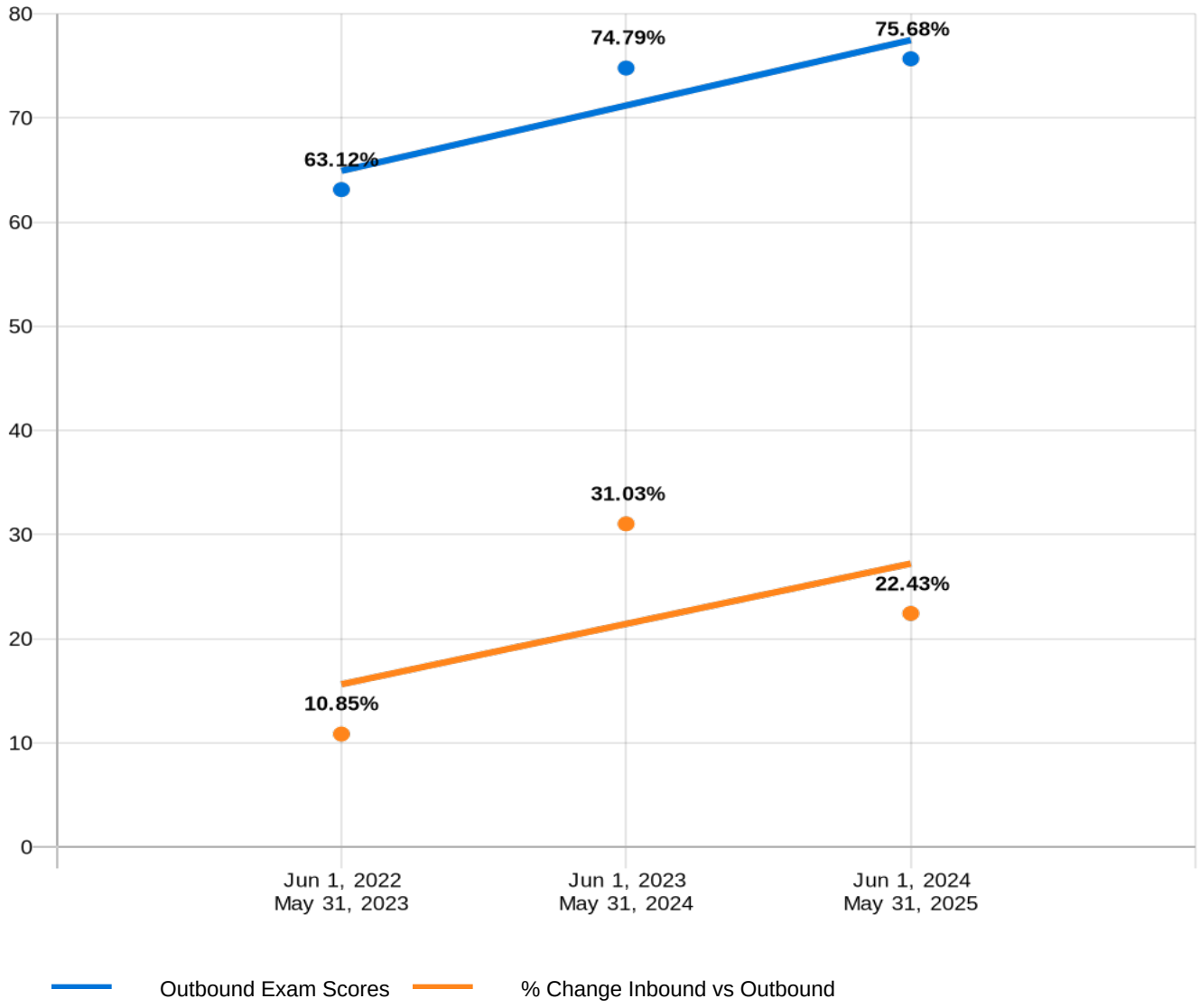
Longitudinal Comparison: Economics



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	58.69%
ACBSP Region 6 (Southwestern Council)	57.89%	66.77%
Faith-based Institution	53.49%	62.71%
Southern Association of Colleges and Schools Commission on Colleges	51.80%	64.68%

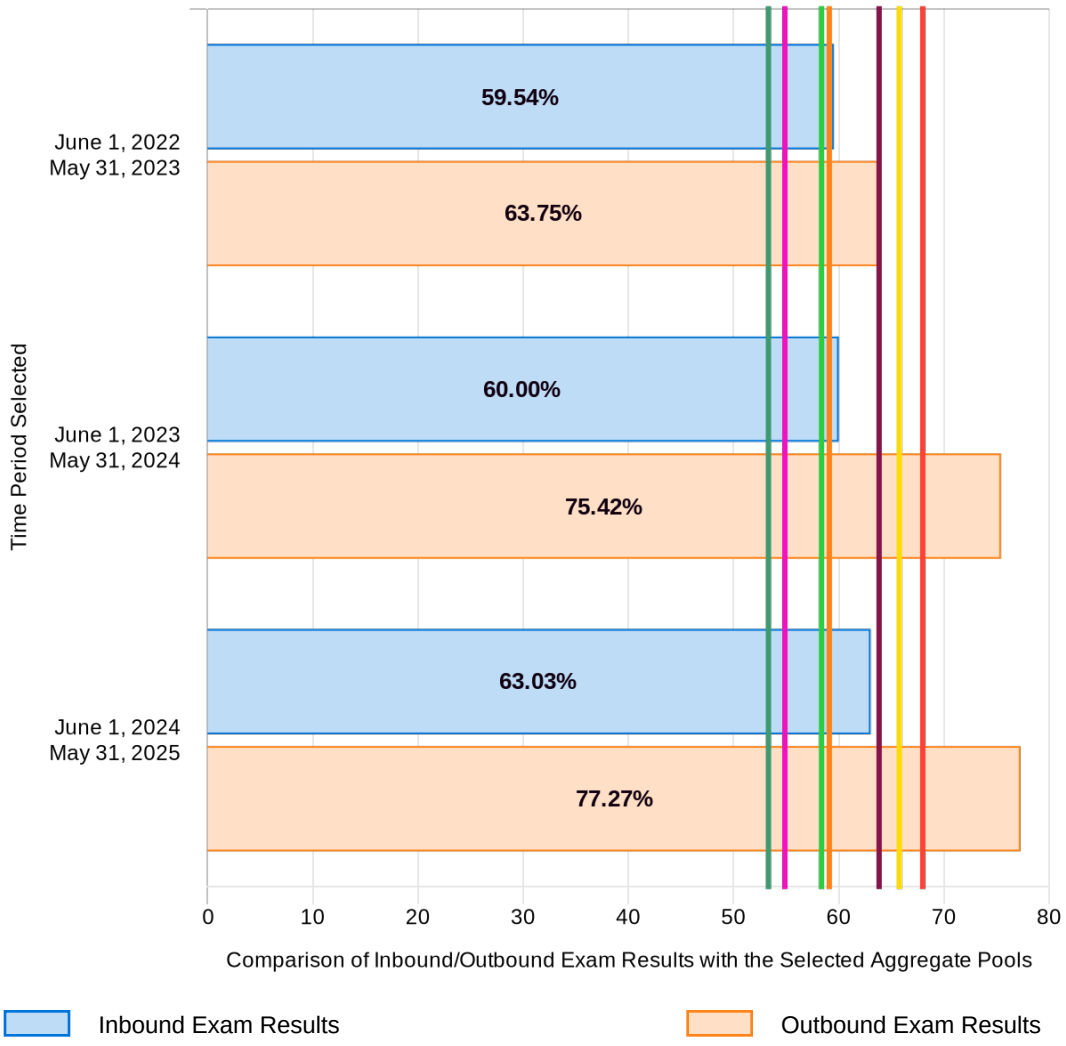
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	6.18	10.85%
Jun 1, 2023 - May 31, 2024	107	58	17.71	31.03%
Jun 1, 2024 - May 31, 2025	80	55	13.86	22.43%

Regression Analysis: Economics



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.80
% Change Inbound vs Outbound	0.33

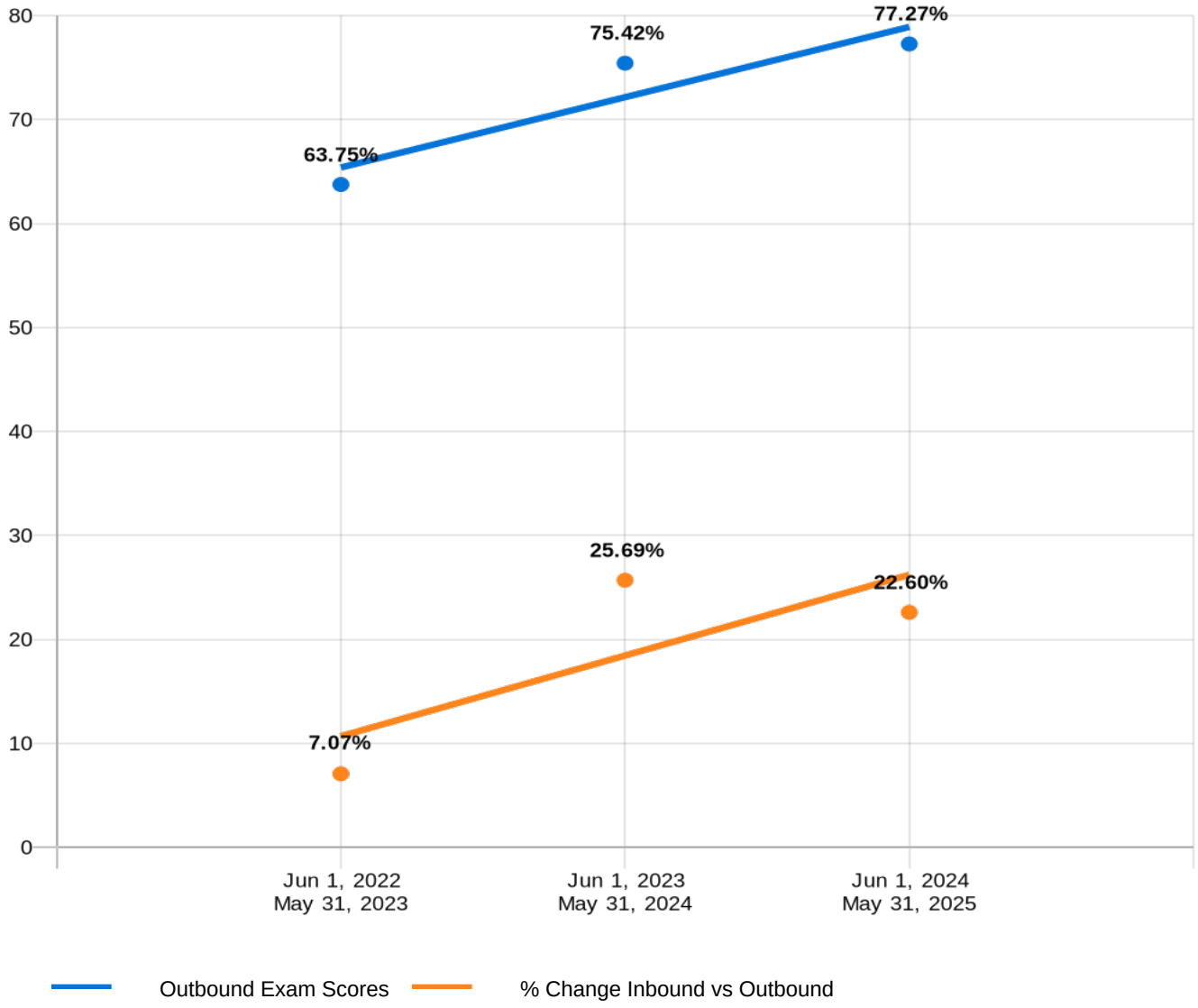
Longitudinal Comparison: Economics: Macroeconomics



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	59.10%
ACBSP Region 6 (Southwestern Council)	58.36%	67.98%
Faith-based Institution	54.88%	63.83%
Southern Association of Colleges and Schools Commission on Colleges	53.32%	65.75%

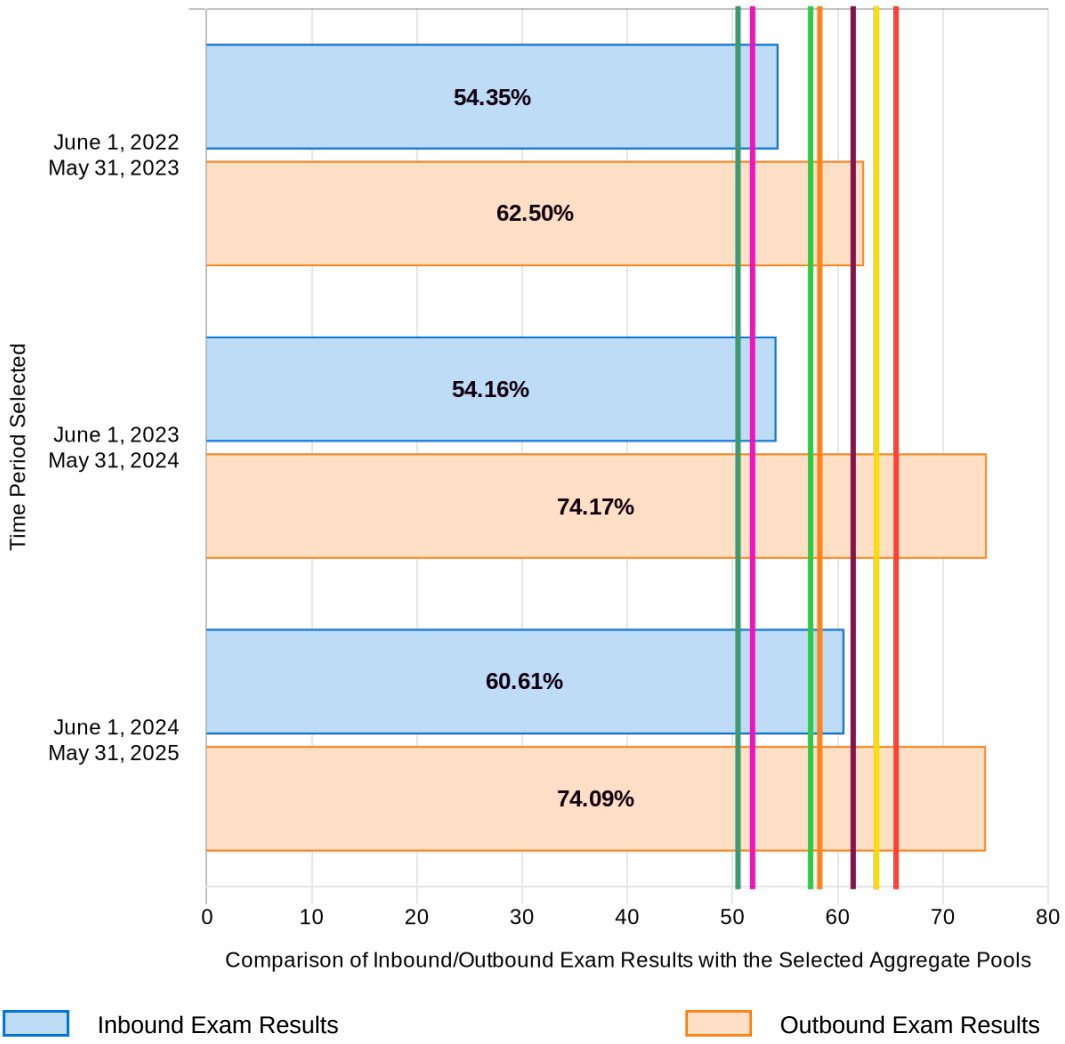
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	4.21	7.07%
Jun 1, 2023 - May 31, 2024	107	58	15.42	25.69%
Jun 1, 2024 - May 31, 2025	80	55	14.24	22.60%

Regression Analysis: Economics: Macroeconomics



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.85
% Change Inbound vs Outbound	0.60

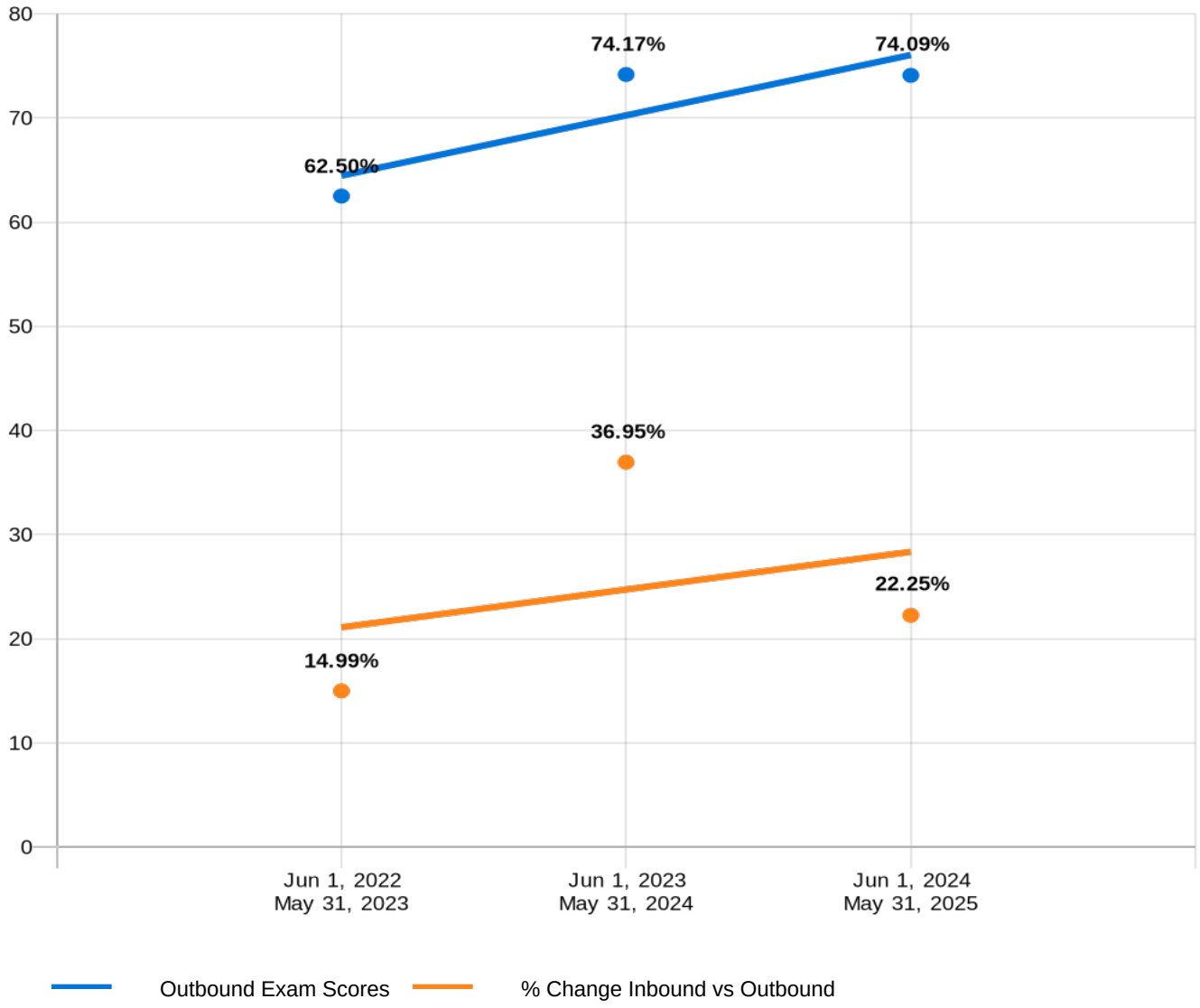
Longitudinal Comparison: Economics: Microeconomics



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	58.29%
ACBSP Region 6 (Southwestern Council)	57.42%	65.55%
Faith-based Institution	51.90%	61.47%
Southern Association of Colleges and Schools Commission on Colleges	50.52%	63.68%

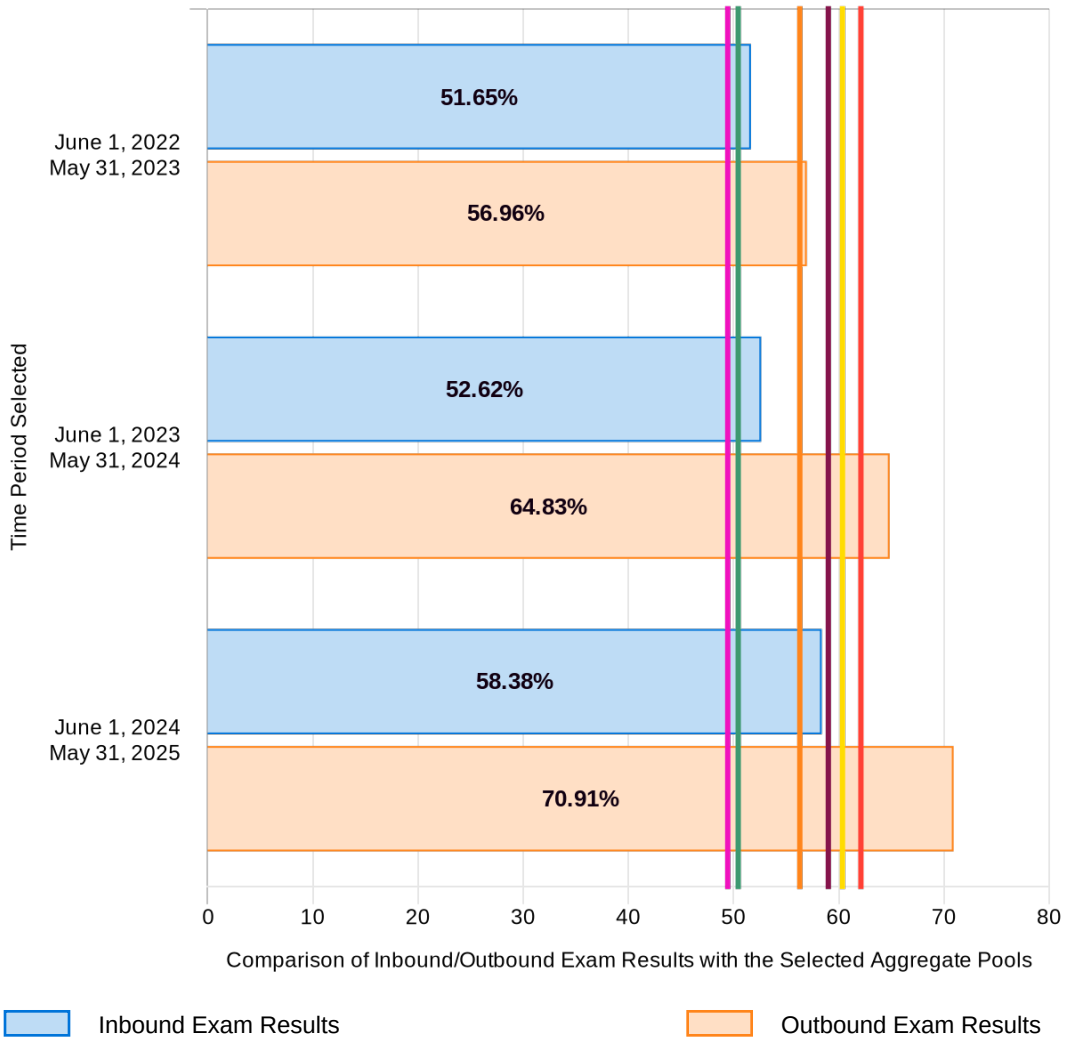
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	8.15	14.99%
Jun 1, 2023 - May 31, 2024	107	58	20.01	36.95%
Jun 1, 2024 - May 31, 2025	80	55	13.48	22.25%

Regression Analysis: Economics: Microeconomics



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.74
% Change Inbound vs Outbound	0.10

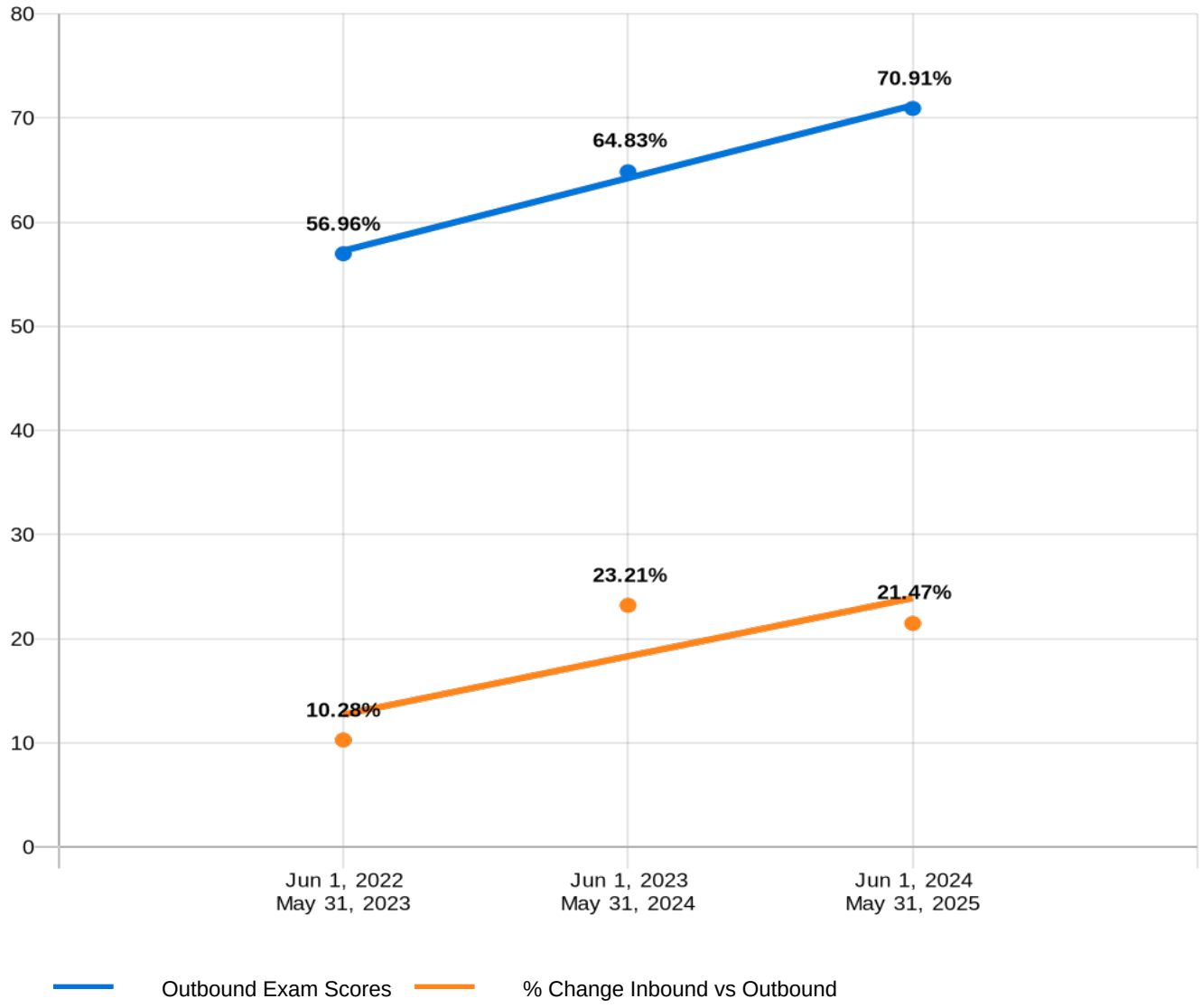
Longitudinal Comparison: Global Dimensions of Business



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	56.30%
ACBSP Region 6 (Southwestern Council)	N/A	62.10%
Faith-based Institution	49.45%	59.01%
Southern Association of Colleges and Schools Commission on Colleges	50.44%	60.35%

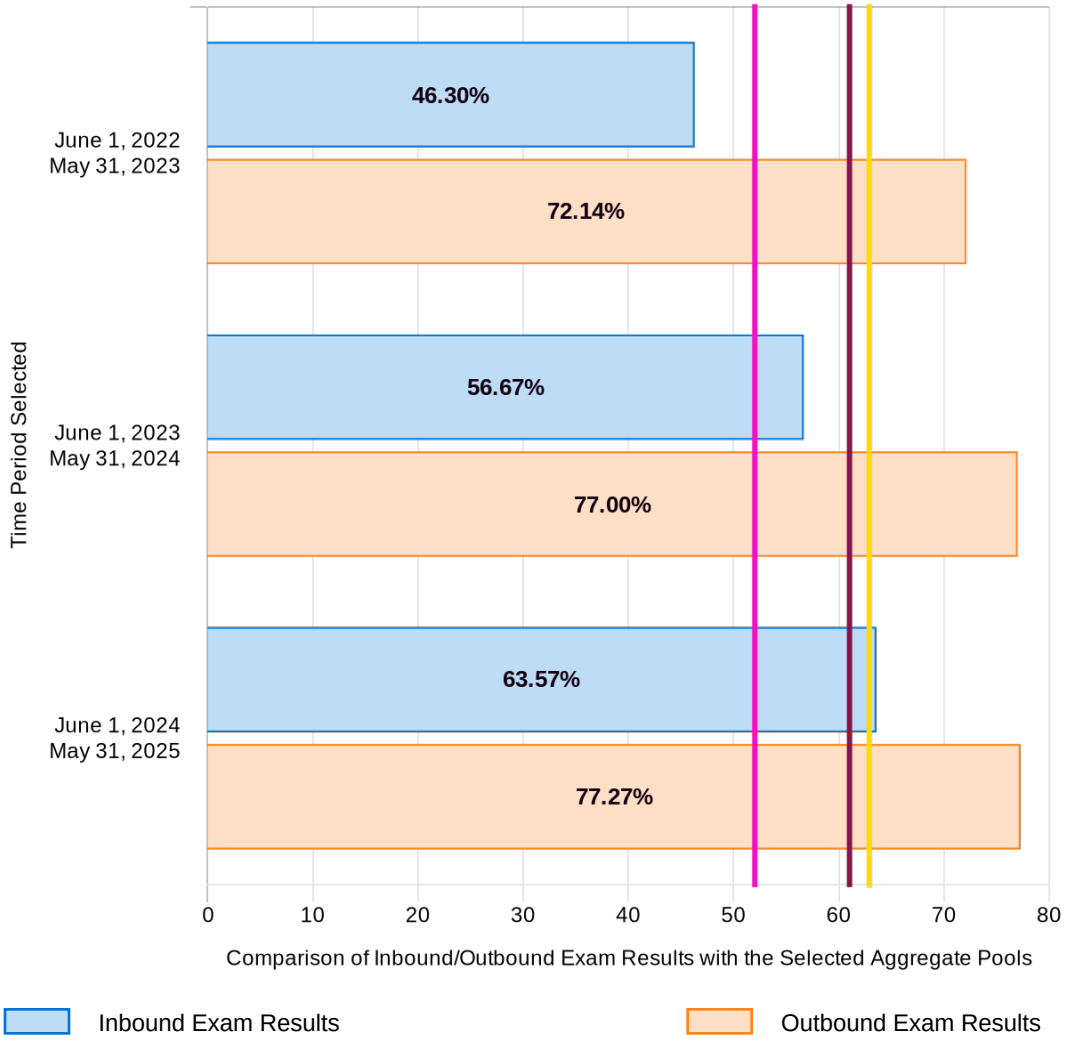
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	5.31	10.28%
Jun 1, 2023 - May 31, 2024	107	58	12.21	23.21%
Jun 1, 2024 - May 31, 2025	80	55	12.53	21.47%

Regression Analysis: Global Dimensions of Business



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.99
% Change Inbound vs Outbound	0.64

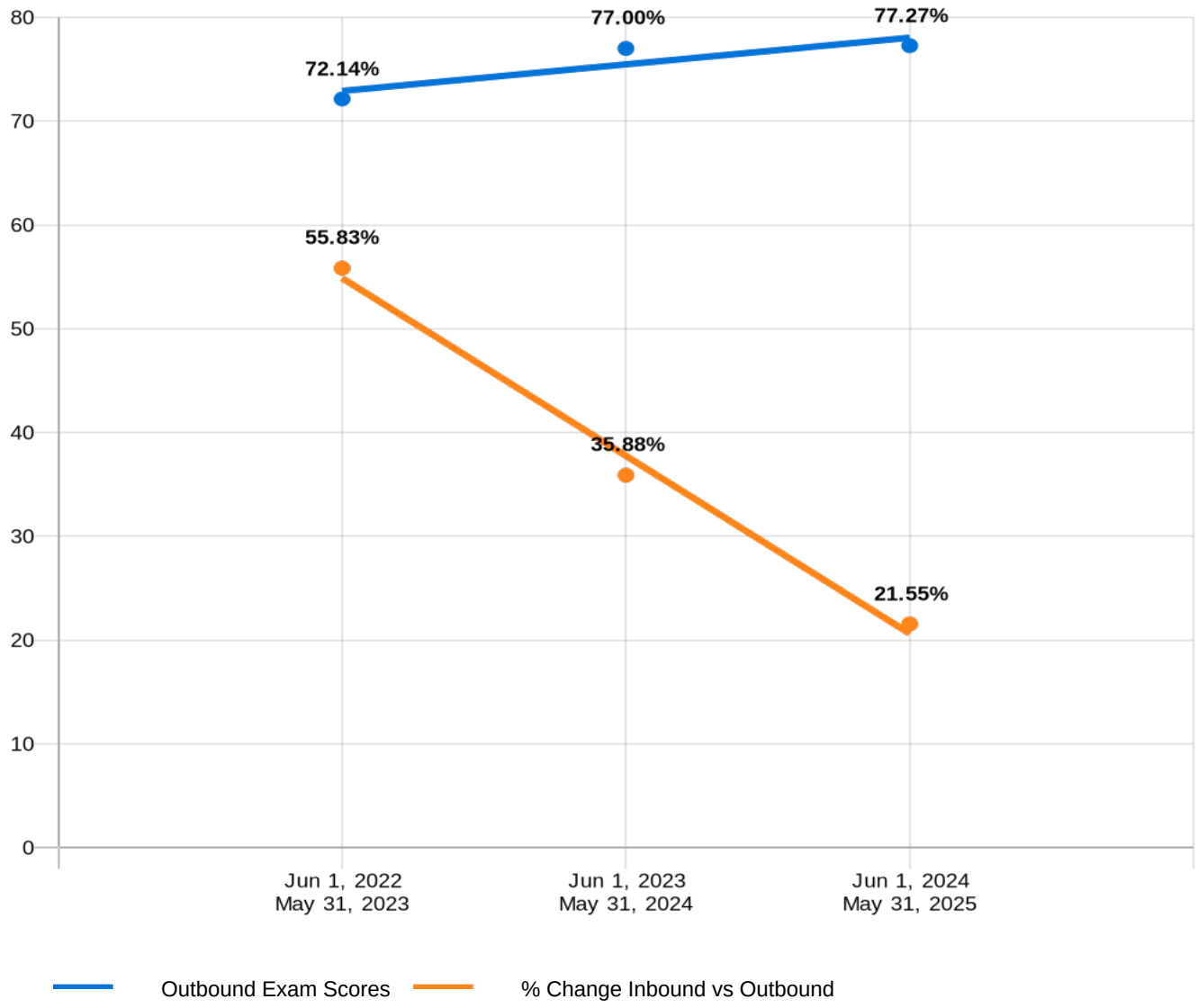
Longitudinal Comparison: HRM Advanced Topic I



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	N/A
ACBSP Region 6 (Southwestern Council)	N/A	N/A
Faith-based Institution	52.02%	61.02%
Southern Association of Colleges and Schools Commission on Colleges	N/A	62.90%

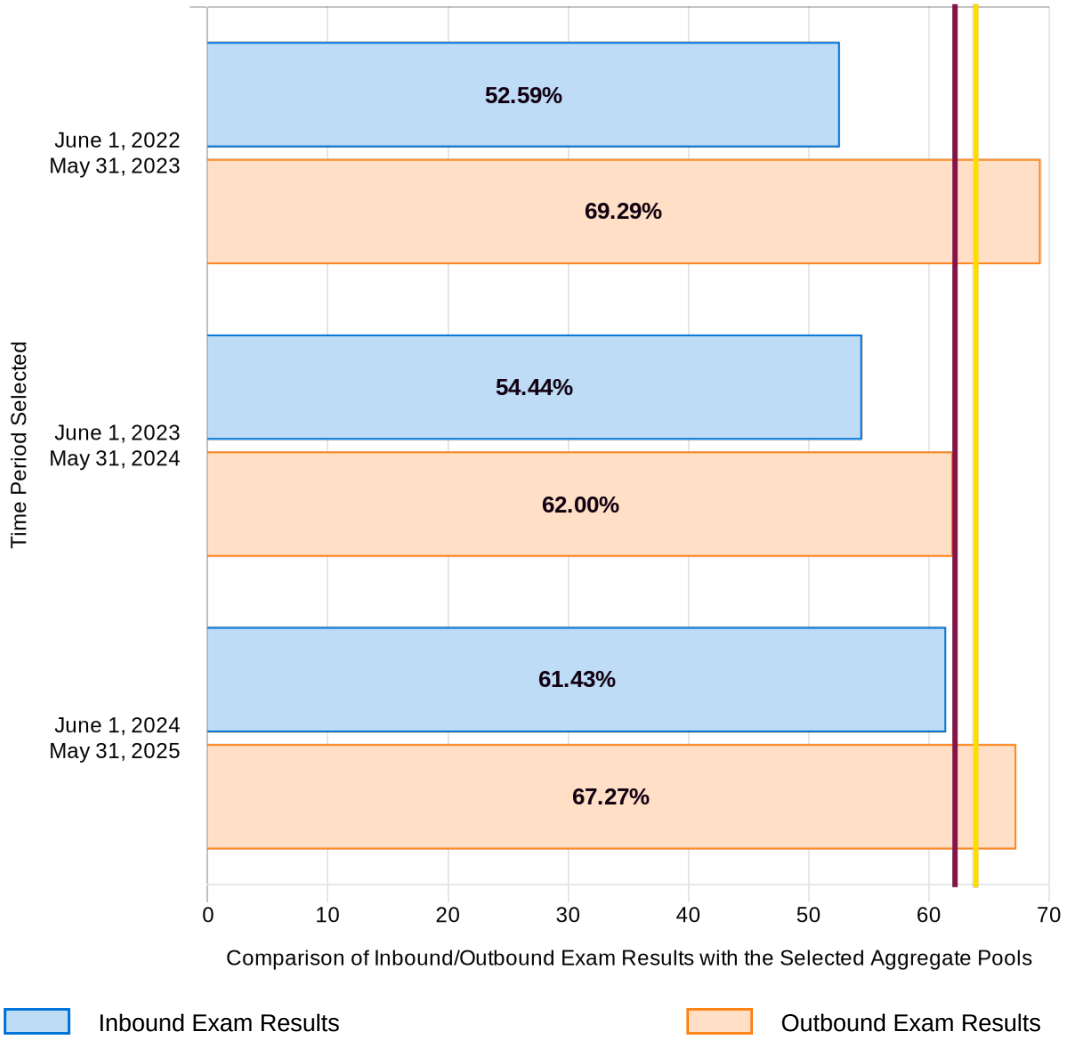
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	25.85	55.83%
Jun 1, 2023 - May 31, 2024	107	58	20.33	35.88%
Jun 1, 2024 - May 31, 2025	80	55	13.70	21.55%

Regression Analysis: HRM Advanced Topic I



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.79
% Change Inbound vs Outbound	0.99

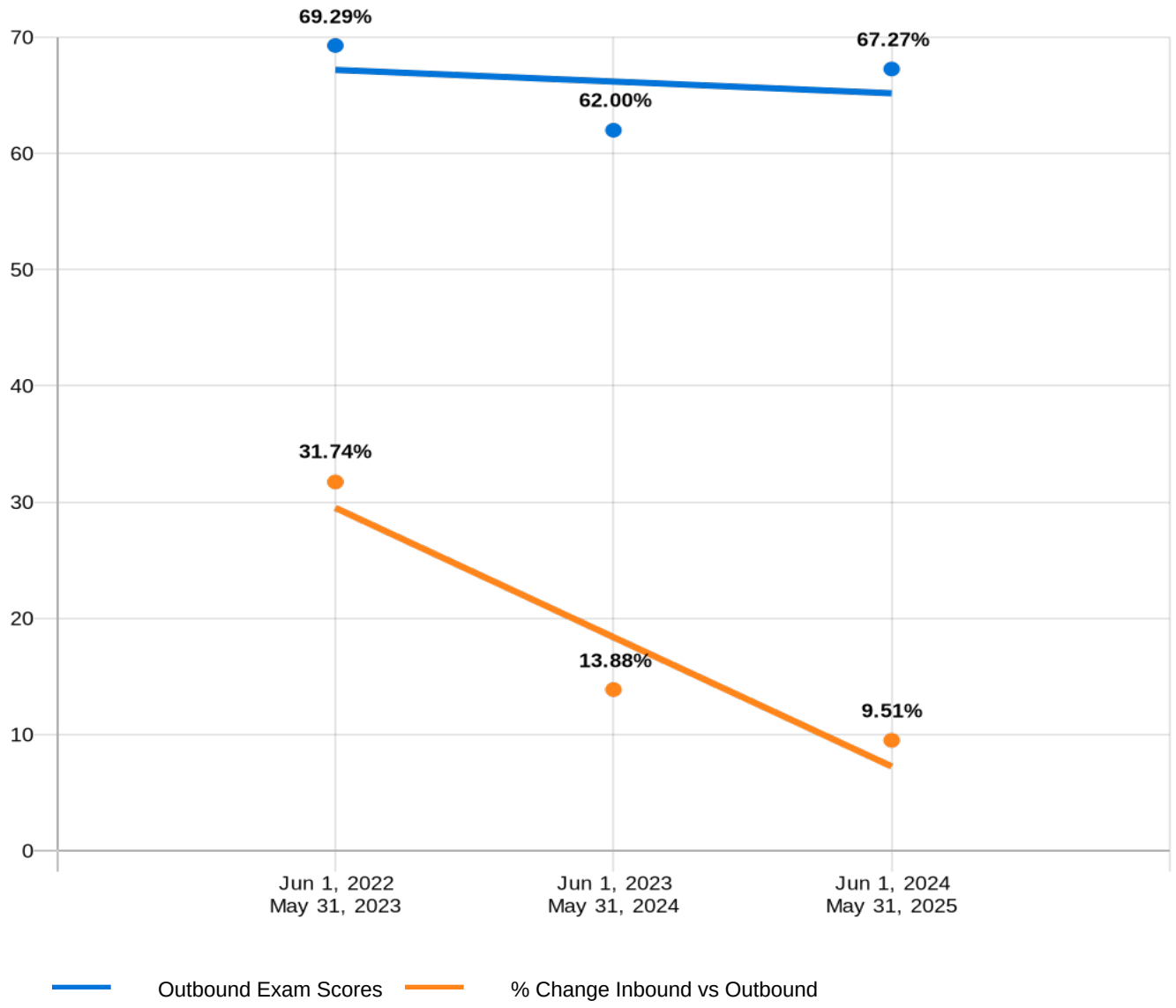
Longitudinal Comparison: HRM Advanced Topic II



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	N/A
ACBSP Region 6 (Southwestern Council)	N/A	N/A
Faith-based Institution	N/A	62.17%
Southern Association of Colleges and Schools Commission on Colleges	N/A	63.90%

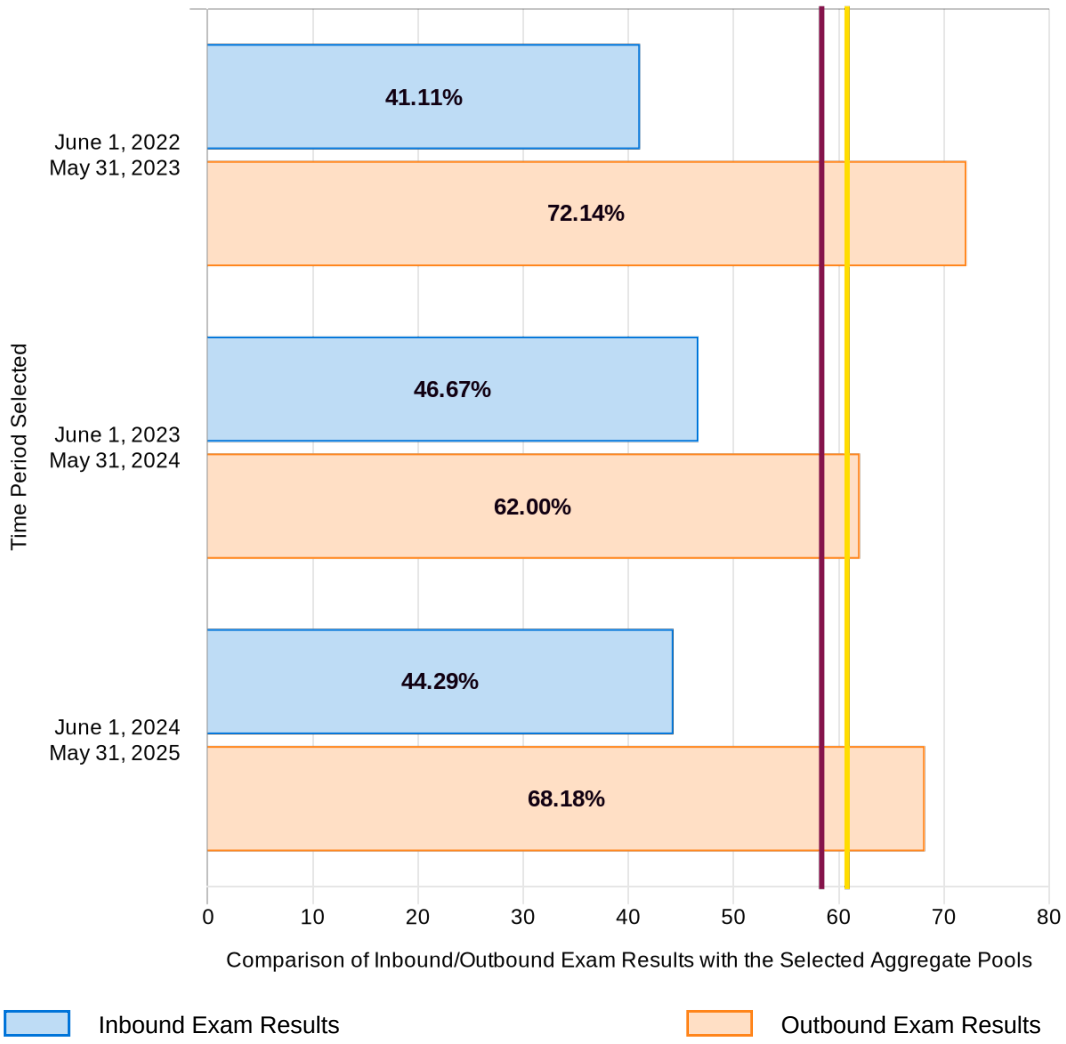
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	16.69	31.74%
Jun 1, 2023 - May 31, 2024	107	58	7.56	13.88%
Jun 1, 2024 - May 31, 2025	80	55	5.84	9.51%

Regression Analysis: HRM Advanced Topic II



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.07
% Change Inbound vs Outbound	0.89

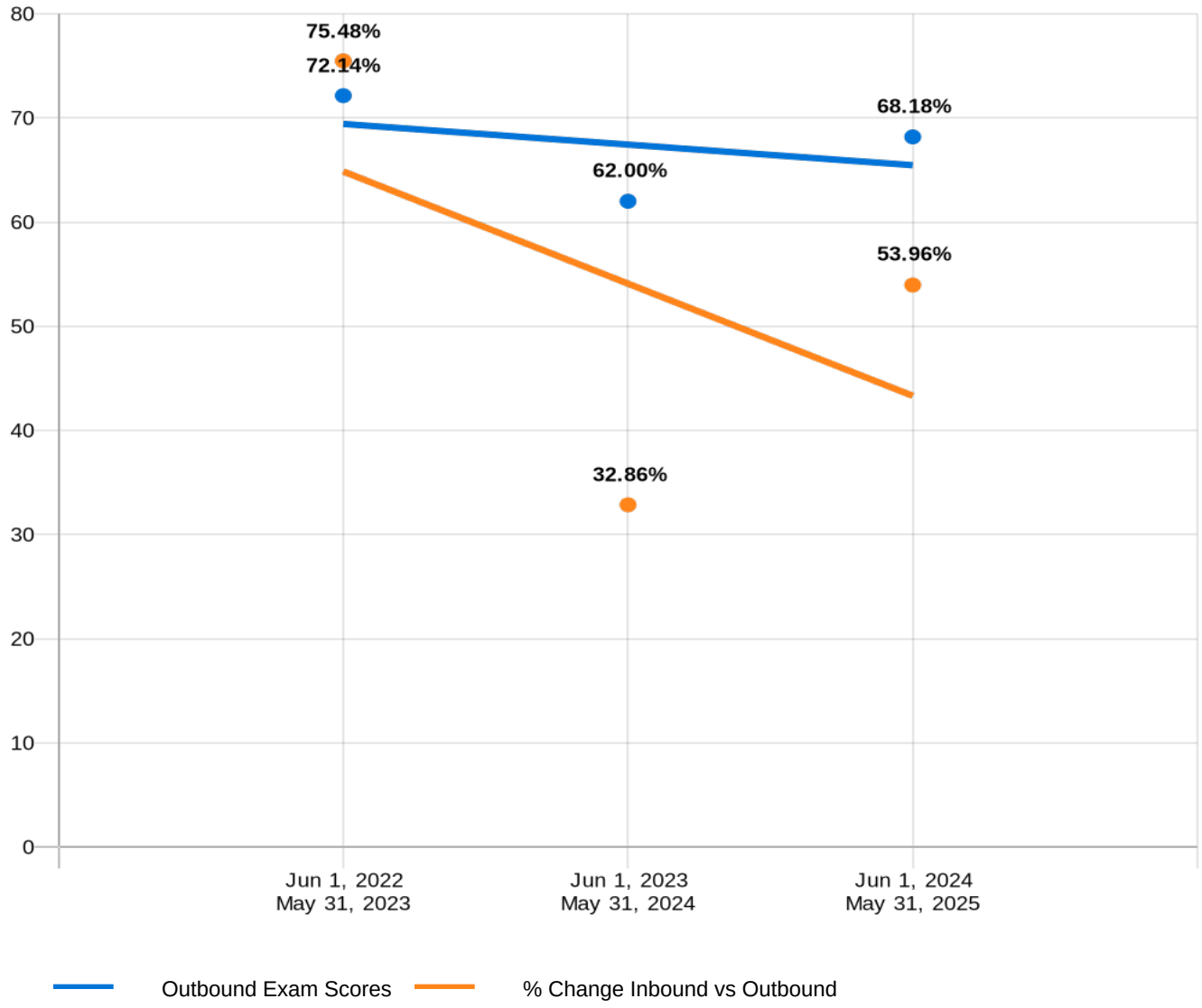
Longitudinal Comparison: HRM Advanced Topic III



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	N/A
ACBSP Region 6 (Southwestern Council)	N/A	N/A
Faith-based Institution	N/A	58.38%
Southern Association of Colleges and Schools Commission on Colleges	N/A	60.79%

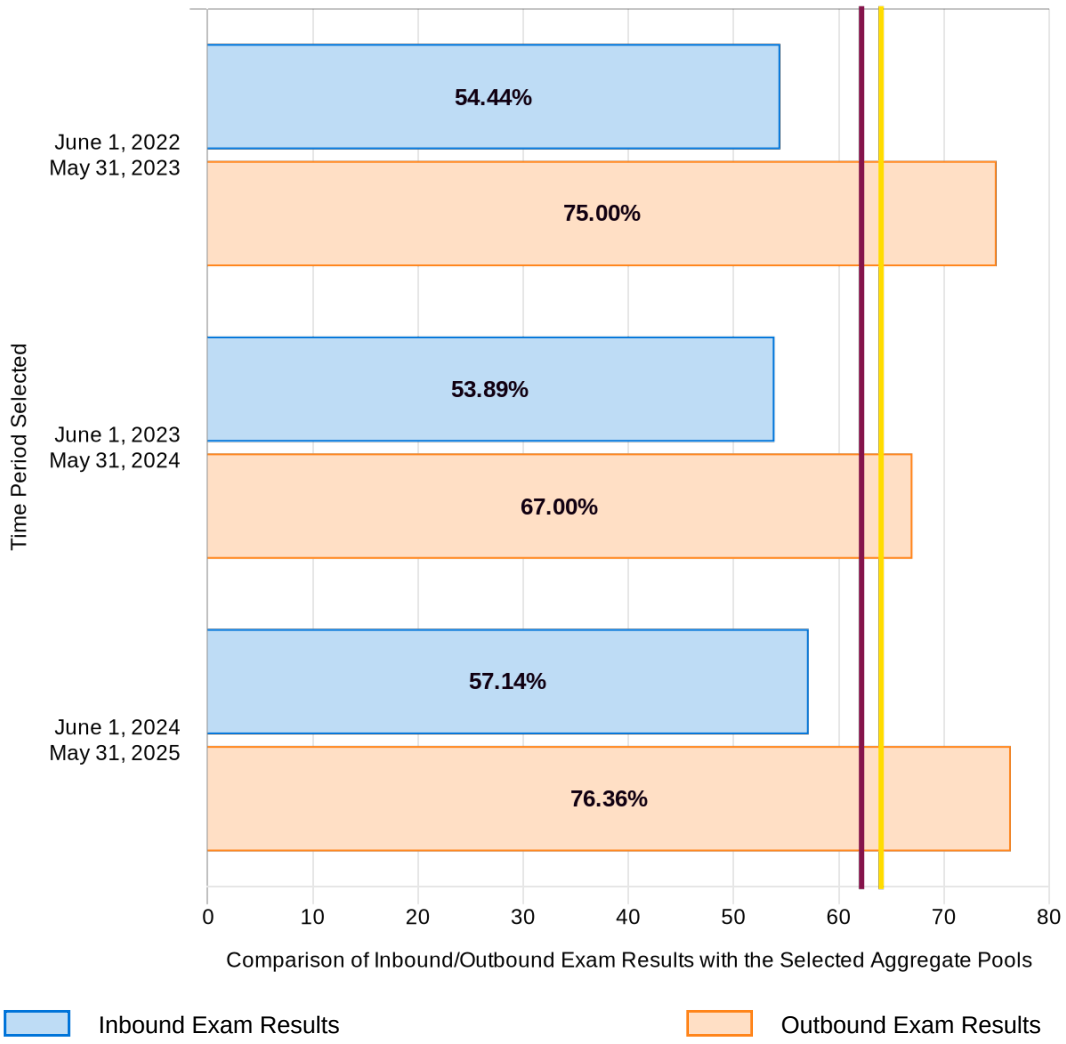
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	31.03	75.48%
Jun 1, 2023 - May 31, 2024	107	58	15.33	32.86%
Jun 1, 2024 - May 31, 2025	80	55	23.90	53.96%

Regression Analysis: HRM Advanced Topic III



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.15
% Change Inbound vs Outbound	0.26

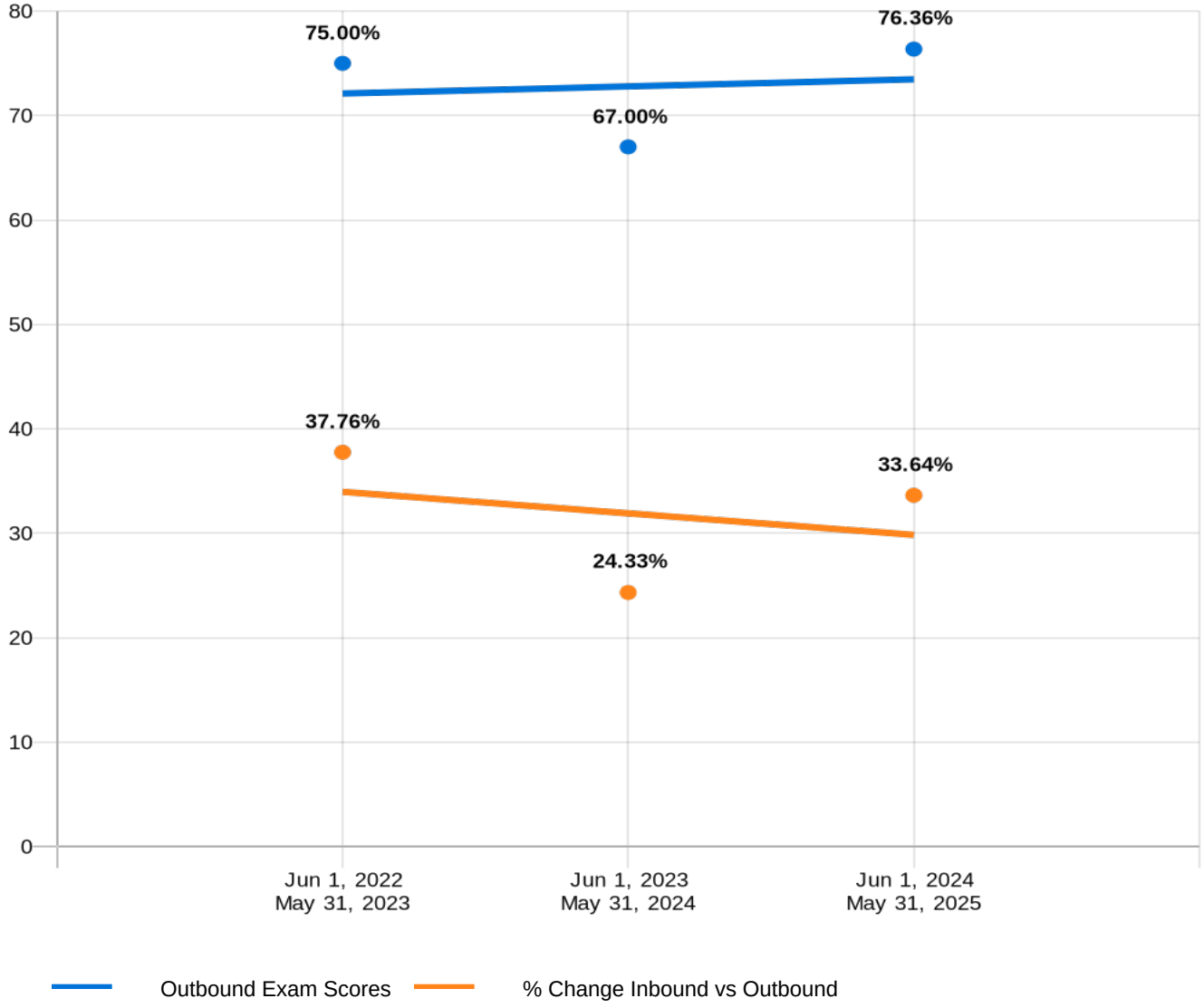
Longitudinal Comparison: HRM Advanced Topic IV



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	N/A
ACBSP Region 6 (Southwestern Council)	N/A	N/A
Faith-based Institution	N/A	62.17%
Southern Association of Colleges and Schools Commission on Colleges	N/A	64.03%

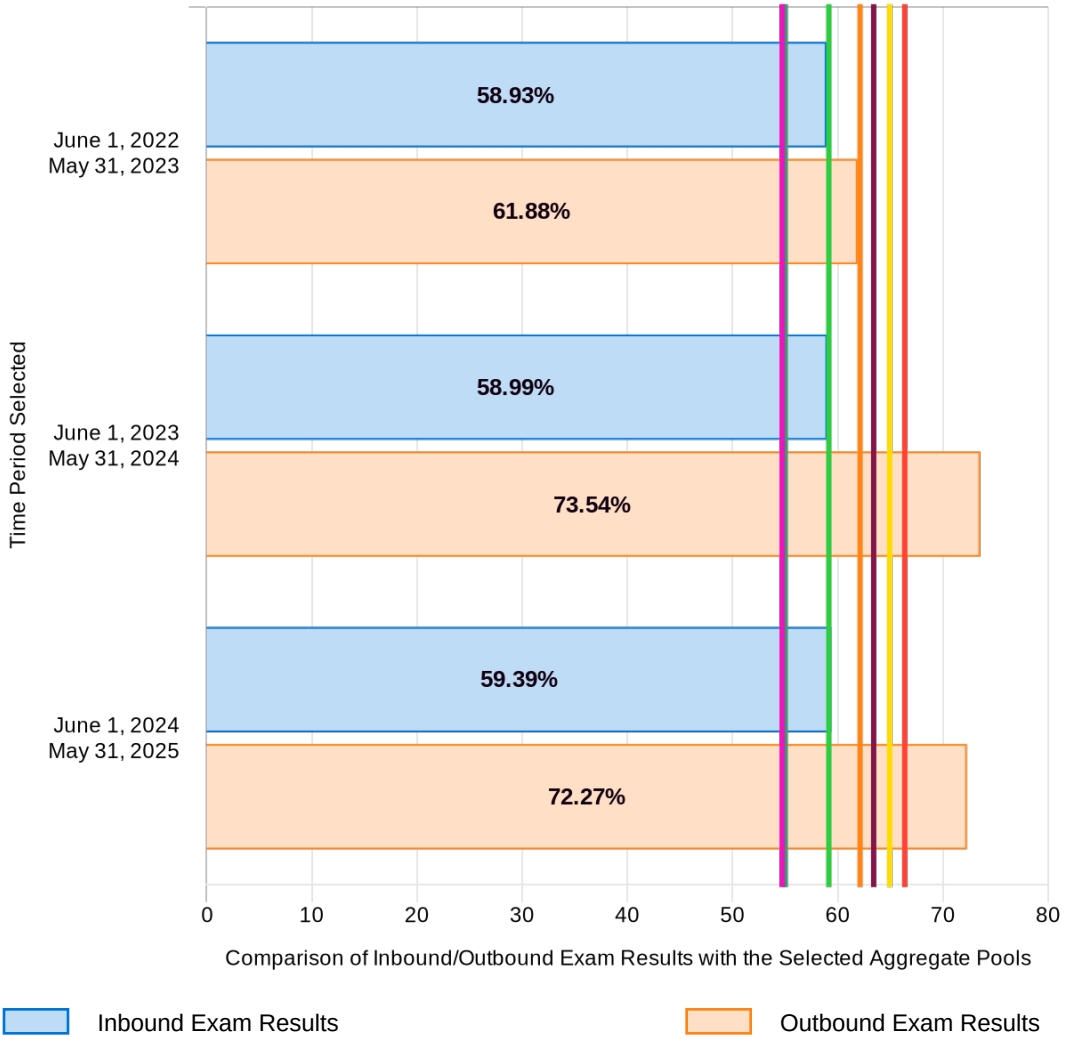
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	20.56	37.76%
Jun 1, 2023 - May 31, 2024	107	58	13.11	24.33%
Jun 1, 2024 - May 31, 2025	80	55	19.22	33.64%

Regression Analysis: HRM Advanced Topic IV



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.02
% Change Inbound vs Outbound	0.09

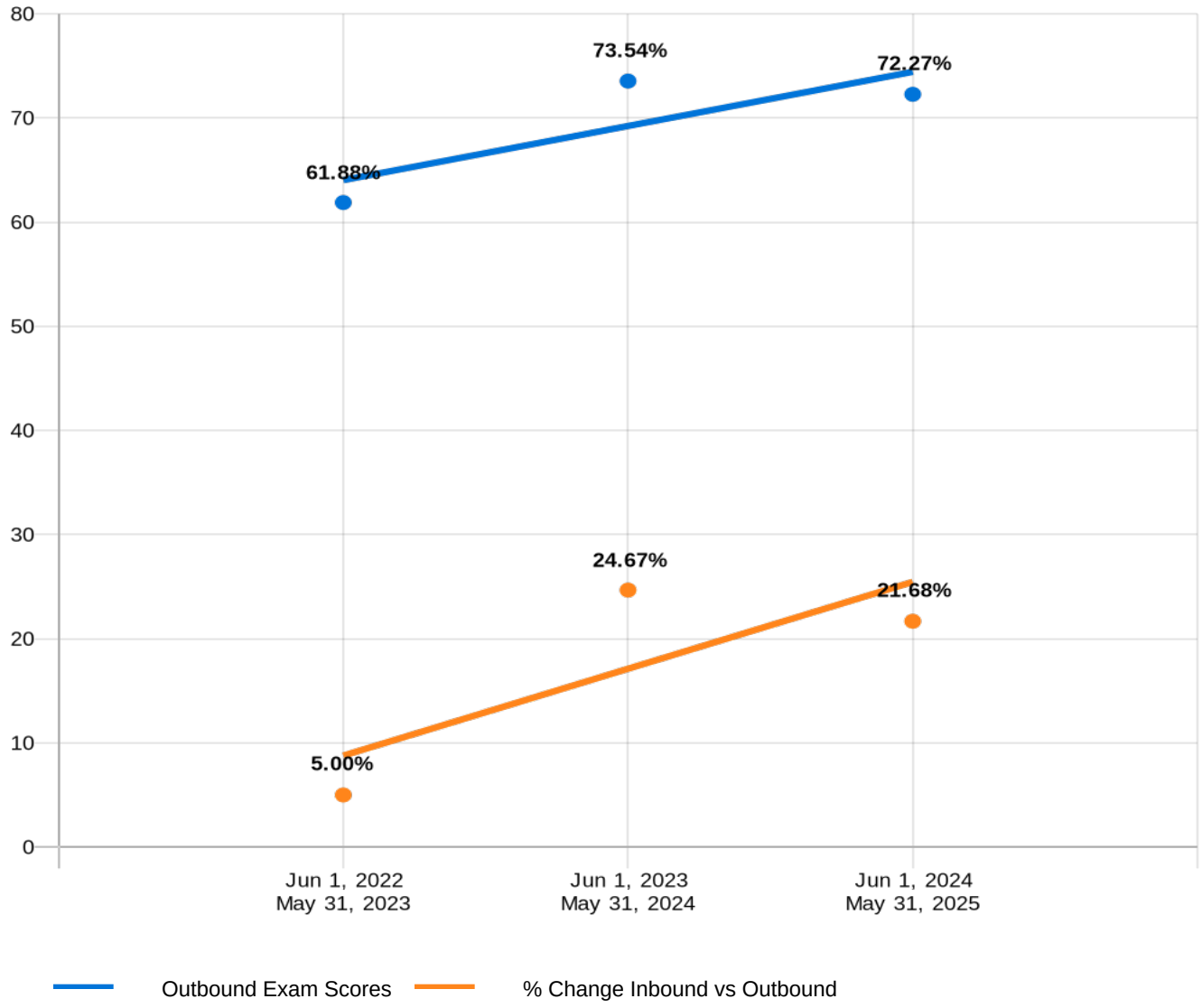
Longitudinal Comparison: Management



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	62.12%
ACBSP Region 6 (Southwestern Council)	59.15%	66.37%
Faith-based Institution	54.71%	63.41%
Southern Association of Colleges and Schools Commission on Colleges	55.01%	64.93%

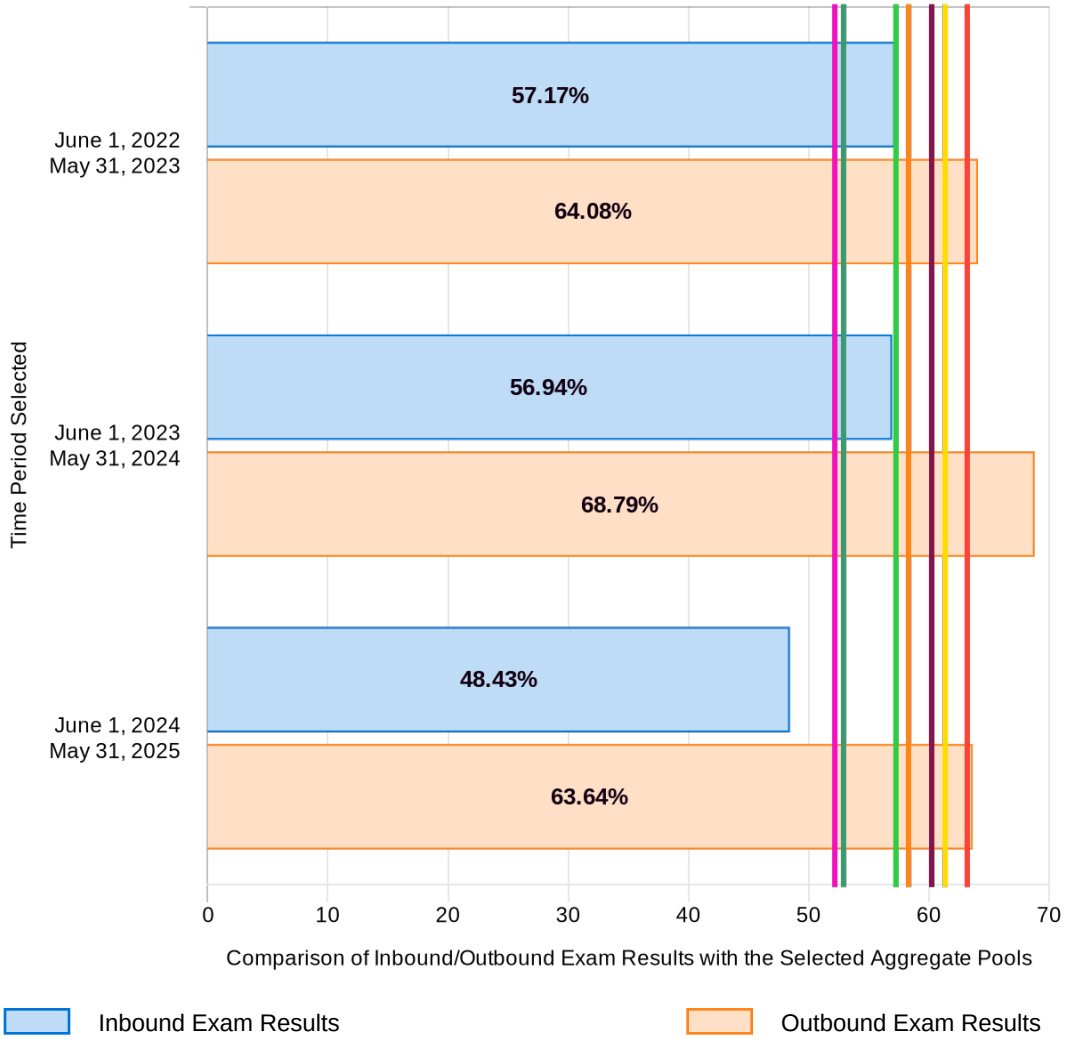
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	2.94	5.00%
Jun 1, 2023 - May 31, 2024	107	58	14.55	24.67%
Jun 1, 2024 - May 31, 2025	80	55	12.88	21.68%

Regression Analysis: Management



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.66
% Change Inbound vs Outbound	0.62

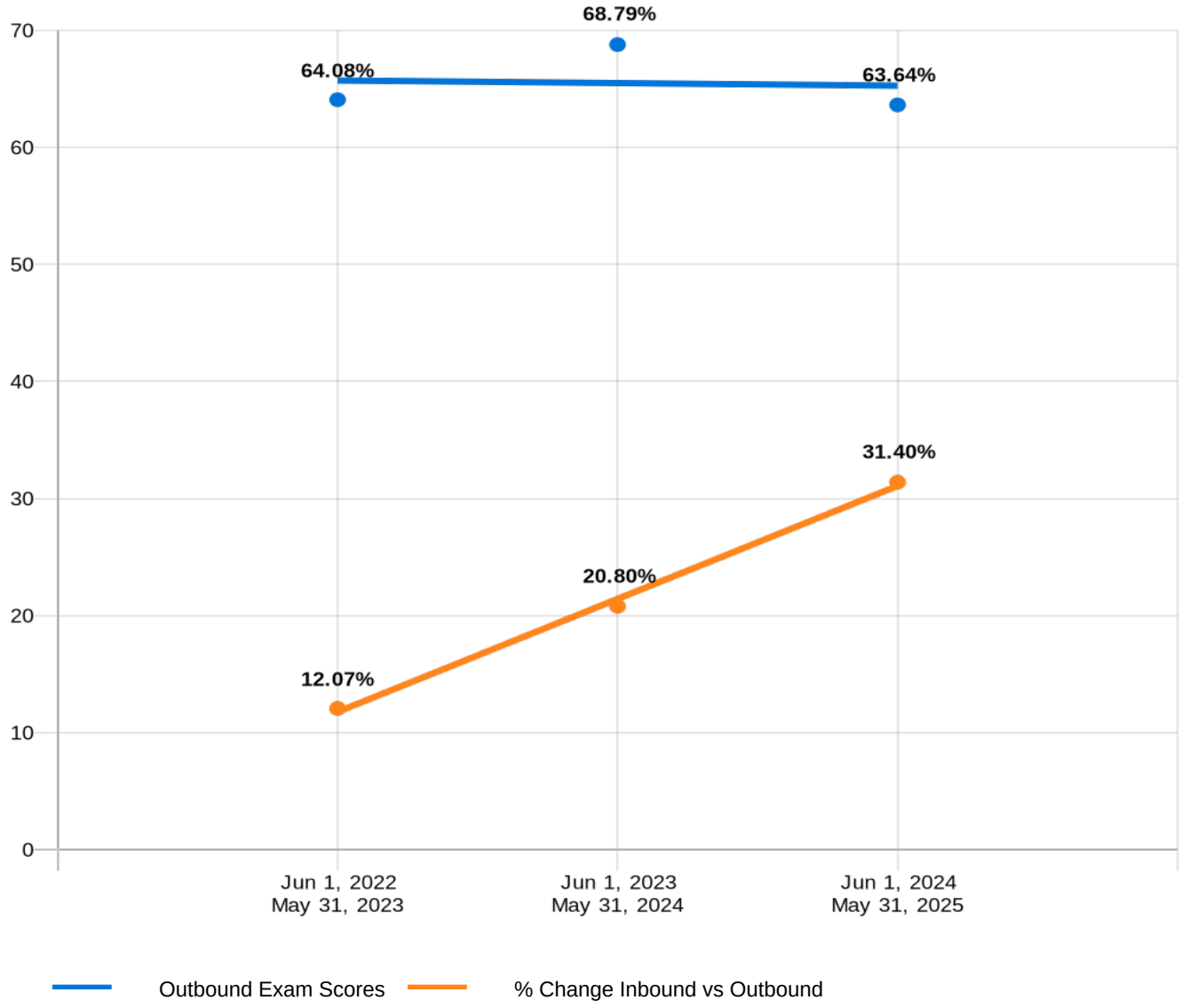
Longitudinal Comparison: Management: Human Resource Management



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	58.30%
ACBSP Region 6 (Southwestern Council)	57.25%	63.18%
Faith-based Institution	52.17%	60.23%
Southern Association of Colleges and Schools Commission on Colleges	52.90%	61.35%

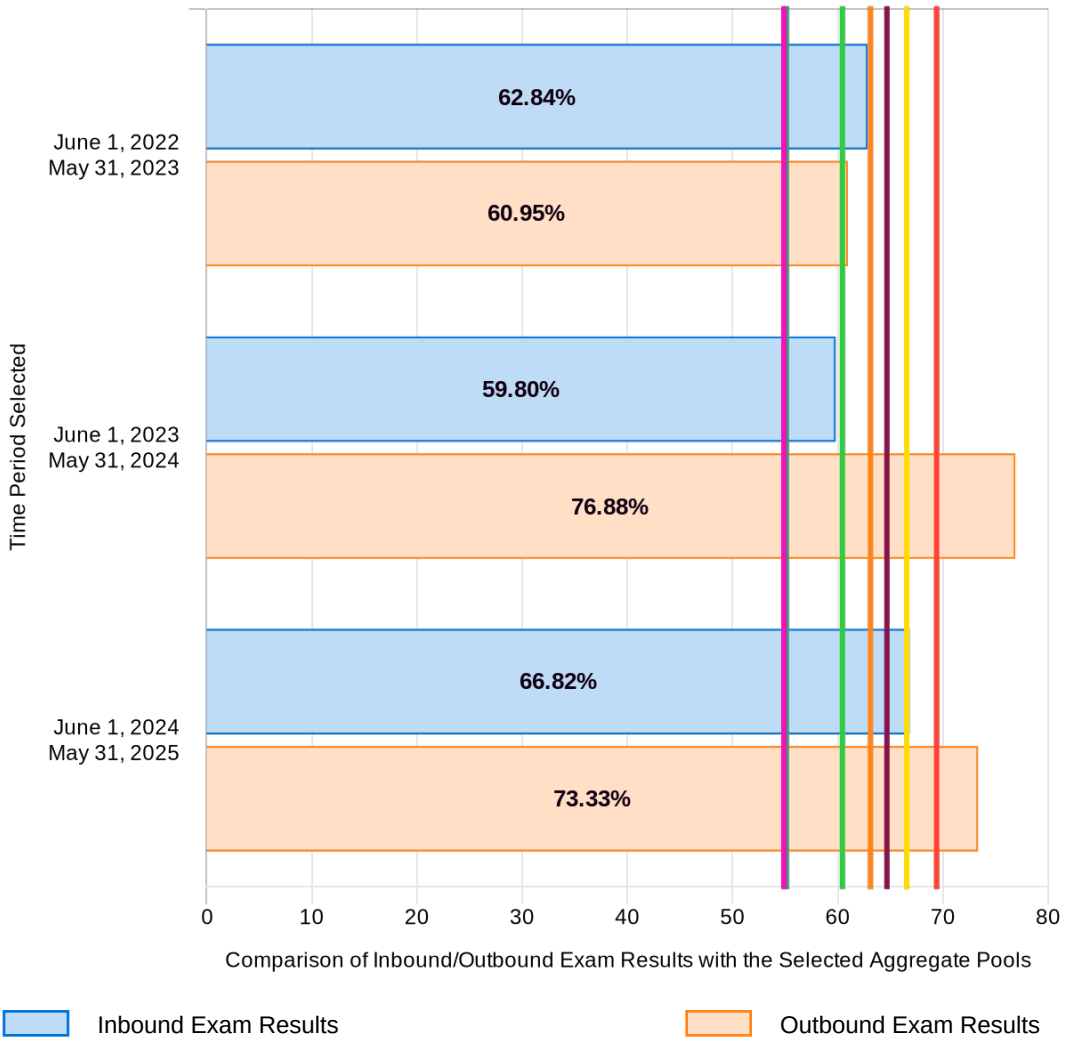
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	6.90	12.07%
Jun 1, 2023 - May 31, 2024	107	58	11.85	20.80%
Jun 1, 2024 - May 31, 2025	80	55	15.21	31.40%

Regression Analysis: Management: Human Resource Management



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.01
% Change Inbound vs Outbound	1.00

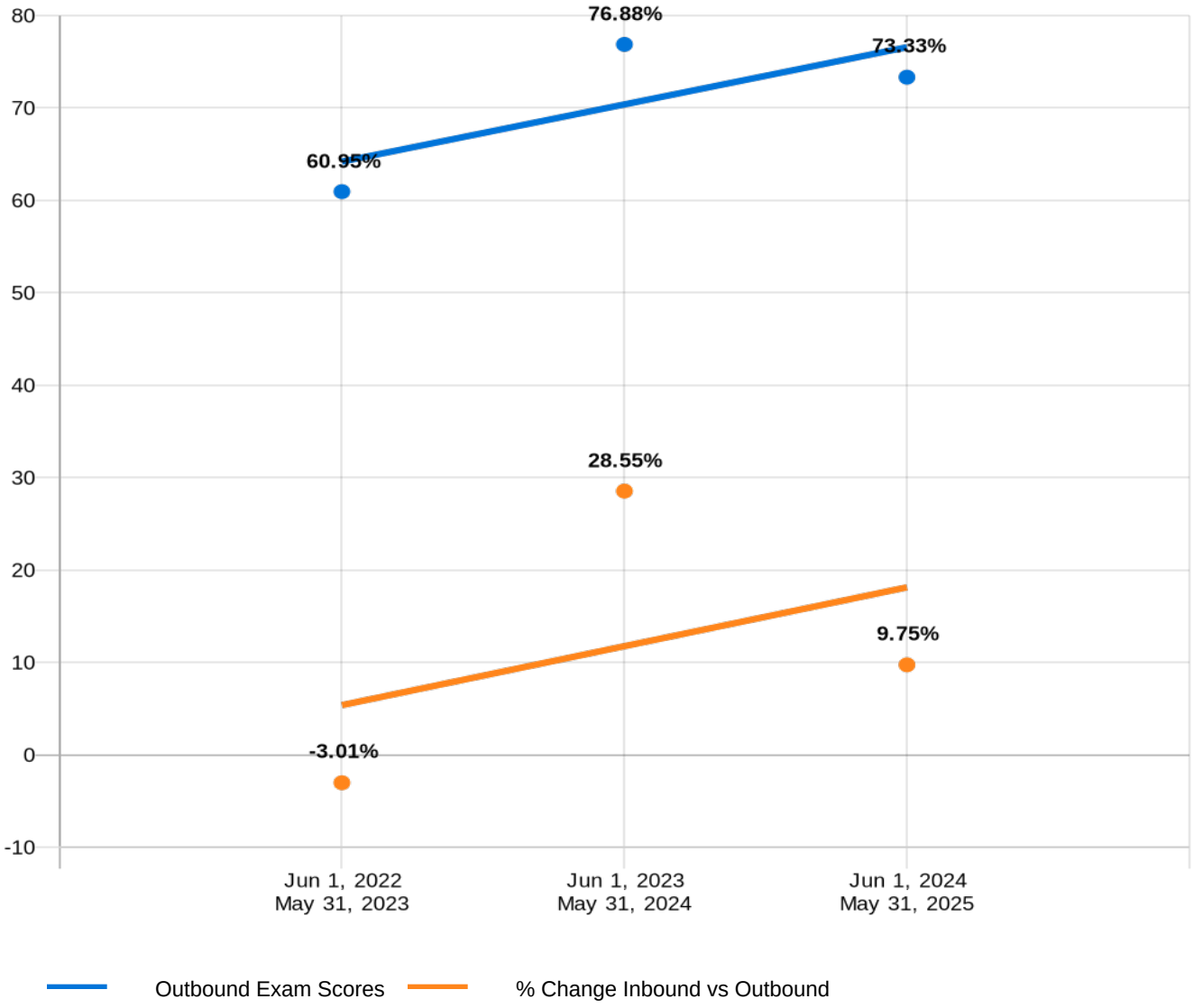
Longitudinal Comparison: Management: Operations/Production Management



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	63.11%
ACBSP Region 6 (Southwestern Council)	60.44%	69.39%
Faith-based Institution	54.87%	64.67%
Southern Association of Colleges and Schools Commission on Colleges	55.11%	66.56%

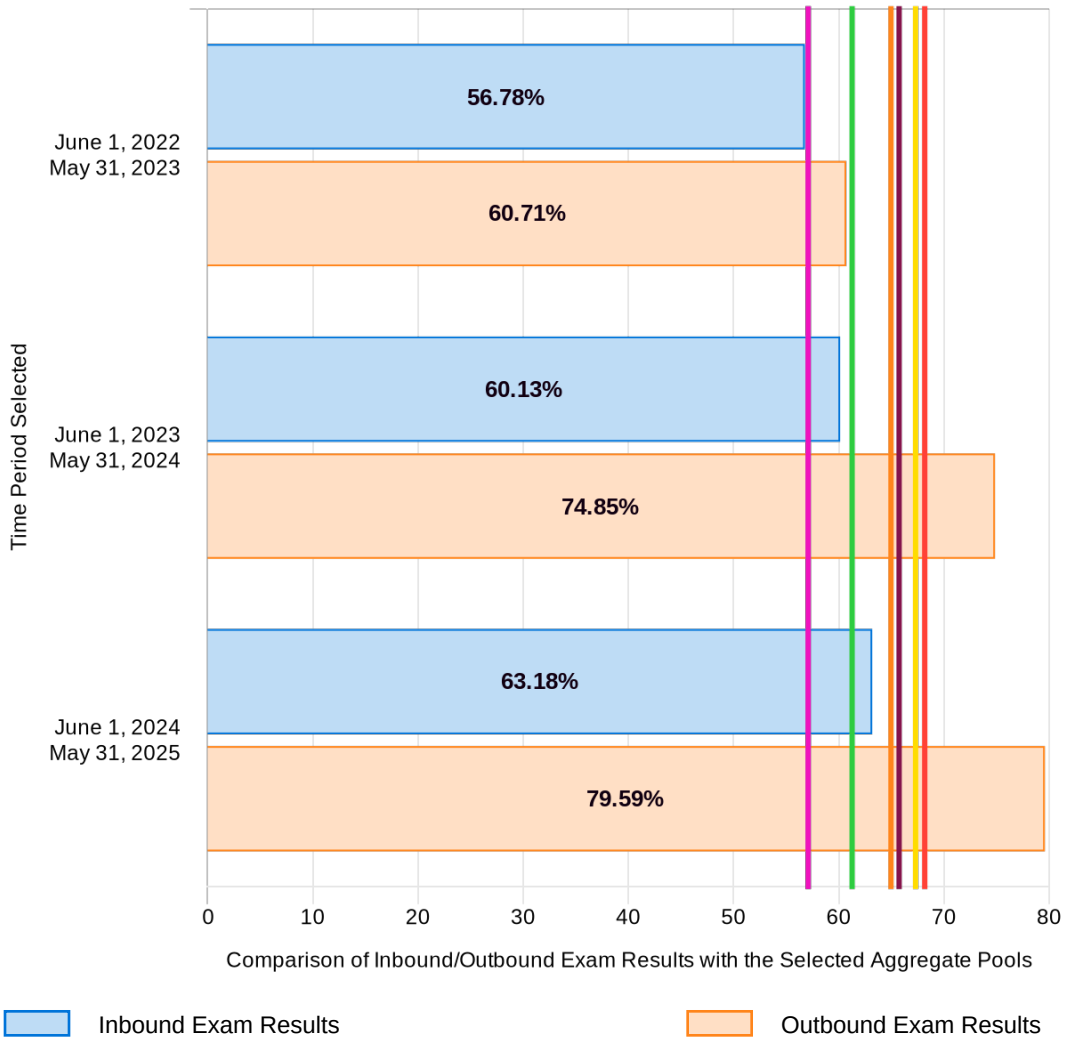
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	-1.89	-3.01%
Jun 1, 2023 - May 31, 2024	107	58	17.07	28.55%
Jun 1, 2024 - May 31, 2025	80	55	6.51	9.75%

Regression Analysis: Management: Operations/Production Management



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.55
% Change Inbound vs Outbound	0.16

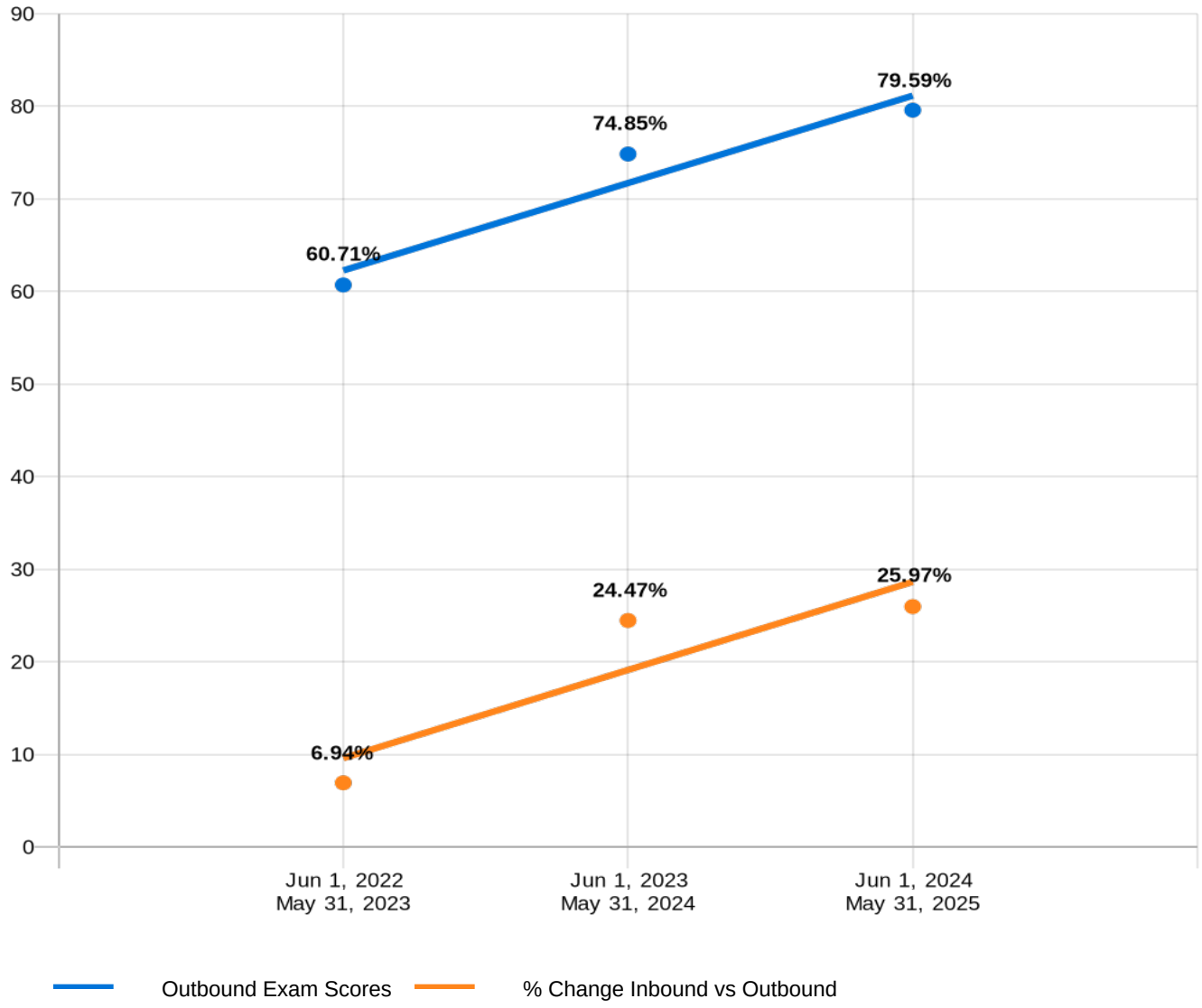
Longitudinal Comparison: Management: Organizational Behavior



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	64.96%
ACBSP Region 6 (Southwestern Council)	61.27%	68.17%
Faith-based Institution	57.09%	65.73%
Southern Association of Colleges and Schools Commission on Colleges	57.10%	67.30%

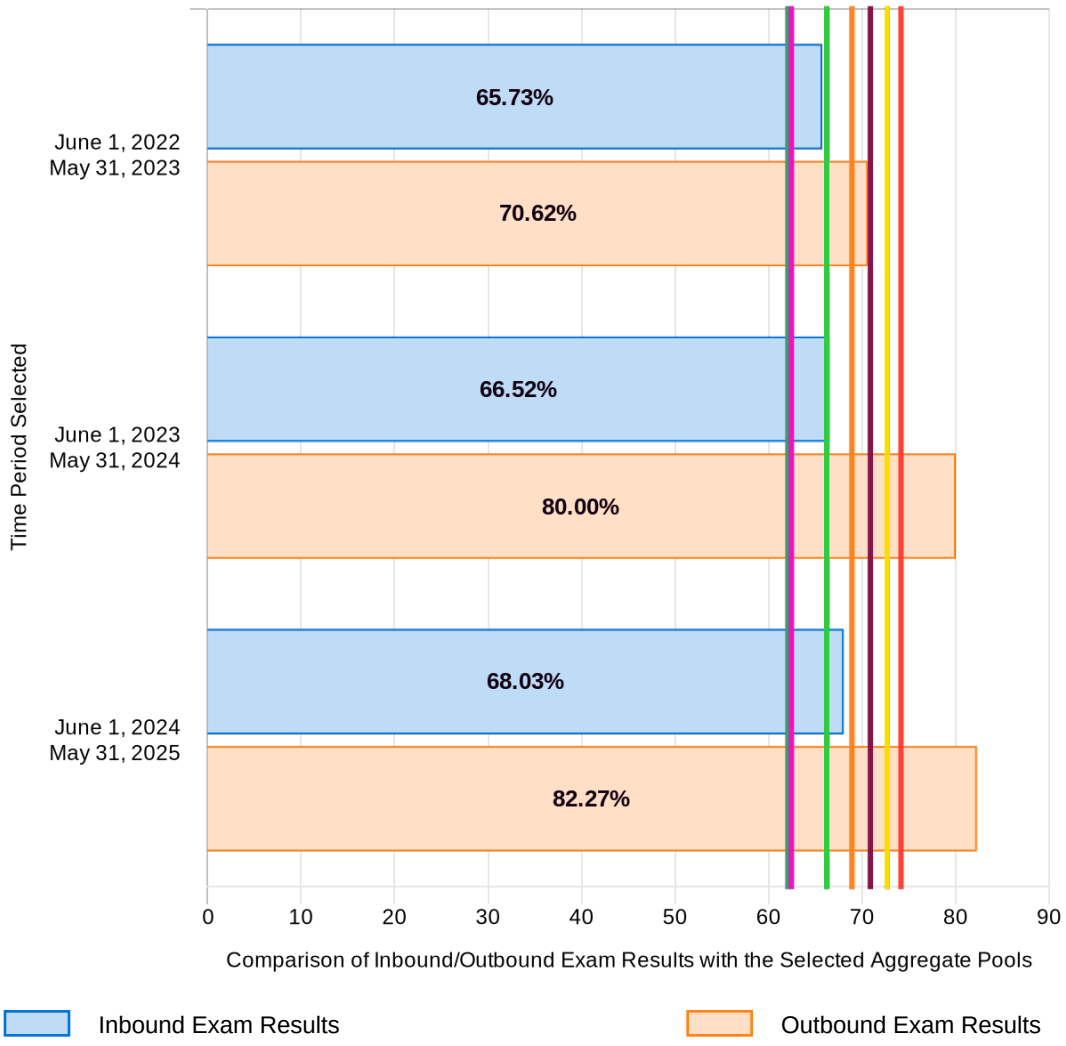
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	3.94	6.94%
Jun 1, 2023 - May 31, 2024	107	58	14.71	24.47%
Jun 1, 2024 - May 31, 2025	80	55	16.41	25.97%

Regression Analysis: Management: Organizational Behavior



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.92
% Change Inbound vs Outbound	0.81

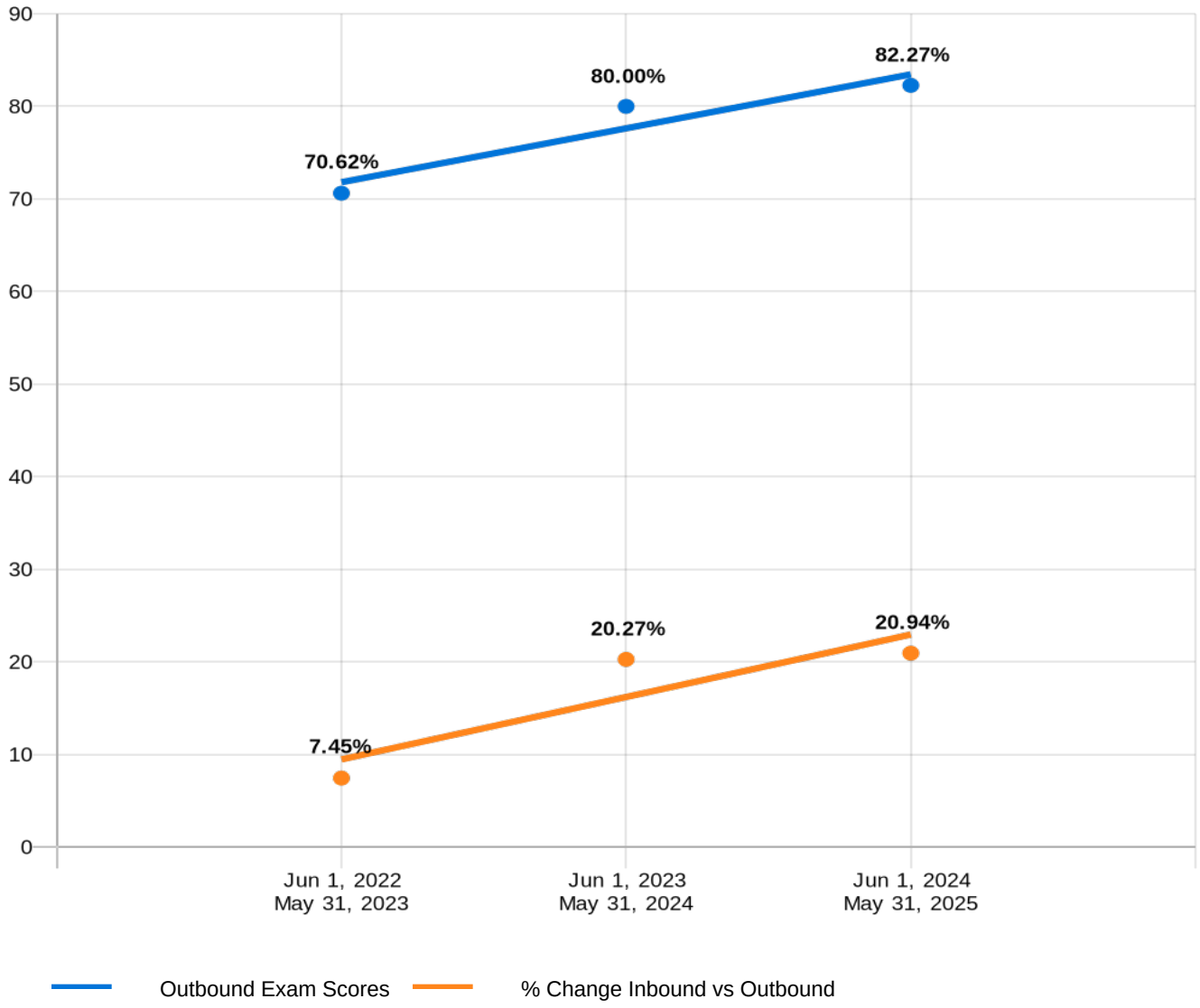
Longitudinal Comparison: Marketing



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	68.91%
ACBSP Region 6 (Southwestern Council)	66.21%	74.15%
Faith-based Institution	62.44%	70.88%
Southern Association of Colleges and Schools Commission on Colleges	62.06%	72.68%

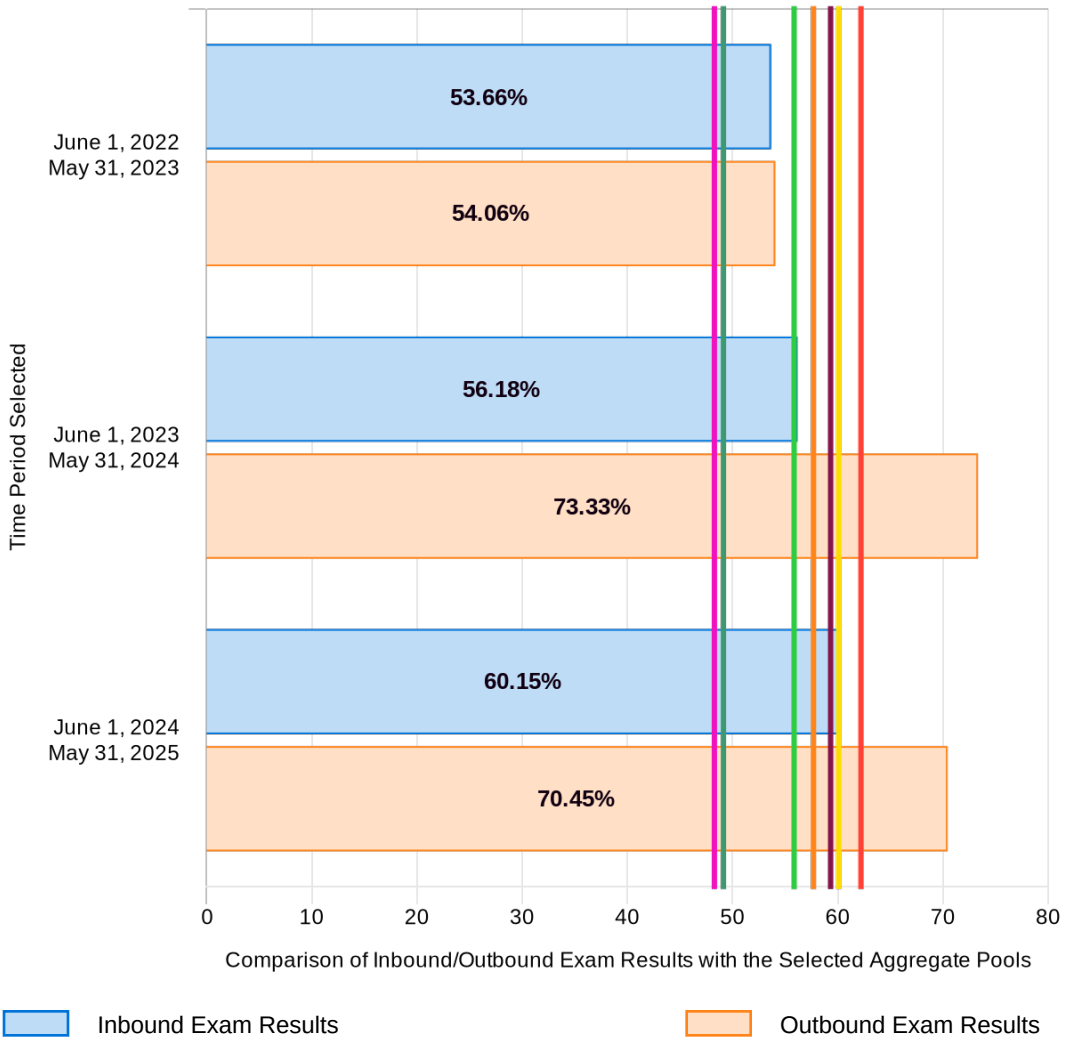
Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	4.90	7.45%
Jun 1, 2023 - May 31, 2024	107	58	13.48	20.27%
Jun 1, 2024 - May 31, 2025	80	55	14.24	20.94%

Regression Analysis: Marketing



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.89
% Change Inbound vs Outbound	0.79

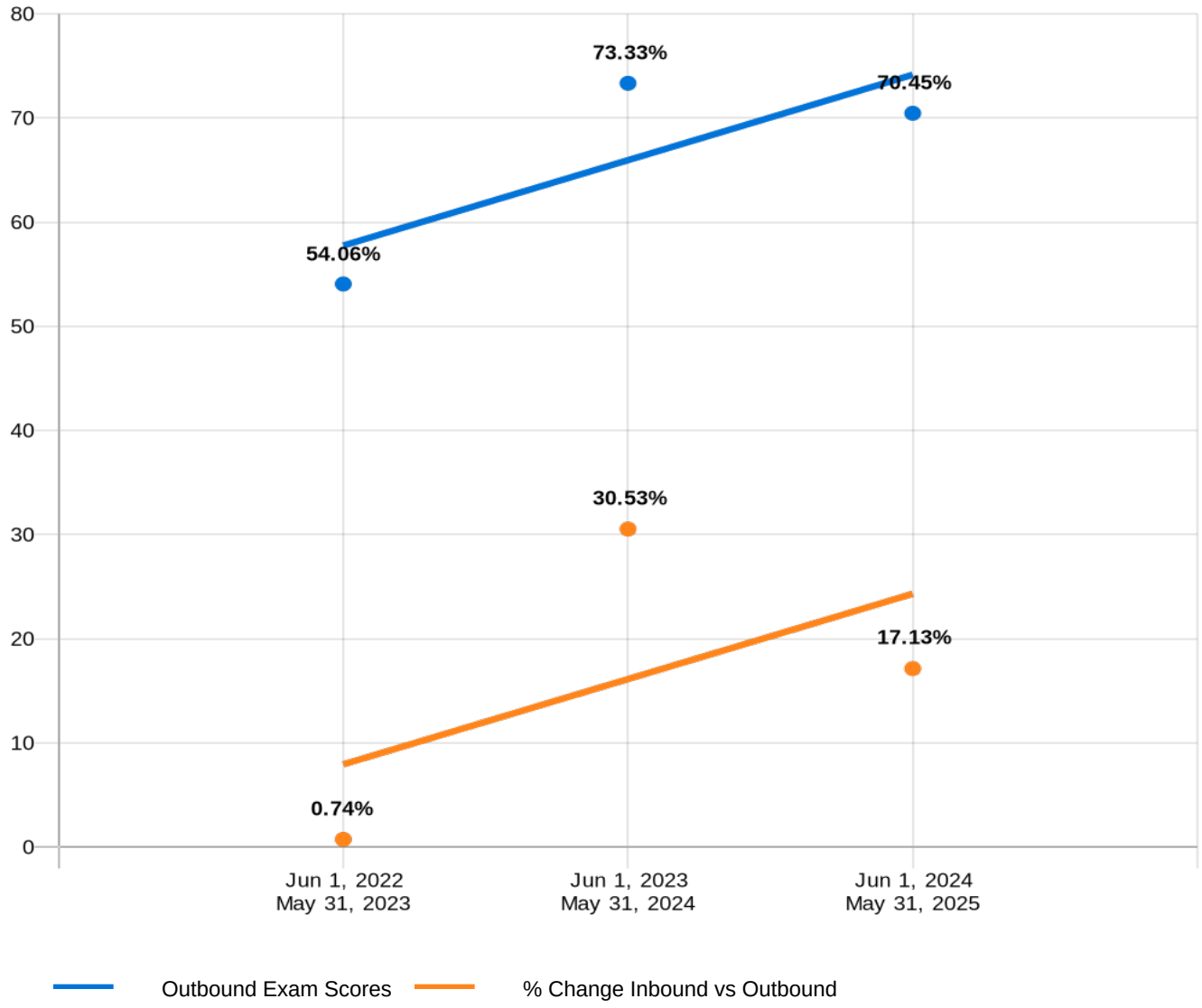
Longitudinal Comparison: Quantitative Research Techniques and Statistics



	Inbound	Outbound
AACSB Accredited - The Association to Advance Collegiate Schools of Business	N/A	57.69%
ACBSP Region 6 (Southwestern Council)	55.85%	62.20%
Faith-based Institution	48.27%	59.32%
Southern Association of Colleges and Schools Commission on Colleges	49.13%	60.09%

Date Range	Number of Inbound Exams	Number of Outbound Exams	Difference	Change
Jun 1, 2022 - May 31, 2023	158	46	0.40	0.74%
Jun 1, 2023 - May 31, 2024	107	58	17.15	30.53%
Jun 1, 2024 - May 31, 2025	80	55	10.30	17.13%

Regression Analysis: Quantitative Research Techniques and Statistics



Regression Analysis	
Comparisons	R^2 Value
Outbound exam scores	0.62
% Change Inbound vs Outbound	0.30

How to Read and Understand the Longitudinal Report

Purpose of the exam

The purpose of the exams is to provide direct assessment of student learning. The exam results are used to assess the strengths and opportunities for improvement of academic programs. The exams measure the knowledge levels of students related to the learning outcomes of the program.

The Longitudinal report is used for examining program results over time. The report provides the comparisons of results of the Inbound and Outbound Exams (and Mid-point Exam when available) by comparing the mean scores for each selected period. Academic officials use the report to support programmatic evaluation by analyzing trends in data, the overall and topic-level results in comparison to selected external benchmarks. The report supports deeper analysis of program changes, further presenting opportunities to evaluate strengths and weaknesses of programs across multiple reporting periods.

Who uses the reports

- Program administrators
- Program directors
- Academic program managers
- Accreditation coordinators
- Assessment coordinators
- Course managers
- Anyone involved with programmatic evaluation

Exam Construct: Inbound and Outbound Approach

An Inbound or Outbound Exam construct provides data for both internal and external benchmarking. The Inbound Exam evaluates the student's knowledge level at the beginning of the student's program of study. The Outbound Exam assesses the student's knowledge level at the end of the student's program of study. The difference in results between the Inbound and Outbound Exams is the direct measure of learning most often used for internal benchmarking.

Additional topic-level comparison to specific aggregate pools allows for both internal and external benchmarking. The assessment results are compared at the topic and subject levels based on percent scores and percentile rankings to determine if student performance is below, at, or above desired thresholds established by the program or school.

The number of questions offered, and the frequency correct value of the aggregates, is based on the sampling of the data at each level (subject, topic, total), independent of each summary level. Thus, the sum of the number of questions offered for a set of subjects may not equal the number of questions offered for the topic.

How to use the Longitudinal Report

Building on the Inbound Exam and relative Outbound Exam Results, the Longitudinal Report includes comparison results at the topic-levels for up to four reporting periods. The Longitudinal Report provides an external comparison of Inbound Exam and Outbound Exam scores with programs' selected aggregate pools and should only be used as a relative index of how the assessed program compares with other programs.

The table summaries in the report provide institutions with the number of Inbound Exams and Outbound Exams for each period, the difference and percentage change between the Inbound Exam scores and the Outbound Exam scores. These data are utilized further exam results analyses, for monitoring changes in results and trends within the data sets over time.

Examples include comparing an exam period before a change was made with the exam results after the change was made. Understanding the effects of change leads to continuous quality improvement. The report is also used to help satisfy accreditation requirements associated with the number of data points to report.

Note: There is a high degree of variability between schools with respect to specific curriculums and areas of emphasis or concentrations. Comparisons include other schools with relatively similar student populations and educational delivery means, not necessarily based on the exact curriculum of the program (which would be nearly impossible and most likely unrealistic). There are multiple pools to select from for the comparisons. Multiple comparisons can be made for the Longitudinal Report.

Analyses used in the Longitudinal Report

The report presents the results of two types of data analyses: Means of Scores Analysis and Analysis of Percentage Change.

a) Means of Scores Analysis. This is a simple mean where we take the total scores and divide by the number of scores. The sample then is either the school's number of exams included in the report or the total number of completed exams in the aggregate pools.

b) Analysis of Percentage Correct. This is the relative change between two numbers where we take a score and compare the percentage change with another score. The percent increase or decrease measure of the changes between two percent values provides us with the relative change between the school's Inbound and Outbound Exam Scores as well as the relative change with the selected aggregates.

How the data are organized and presented

The Longitudinal Report is a comprehensive overview of exam results with selected aggregate pools over time. The first graph is a side-by-side overview of the exam comparisons' results. If Inbound or Mid-point exams are included, this graph displays Inbound, Mid-point, and Outbound exam averages as a percentage score comparison for up to four exam periods. Following is a table below each graph providing corresponding descriptive data related to each exam period to include: the number of Inbound and Outbound Exams taken during the exam period, the difference in Inbound and Outbound Exam scores and the percentage change in Inbound and Outbound Exam Scores. The final graph illustrates the regression total. A table summarizing the regression analyzed results are provided.

Similar to the total score comparison of Longitudinal Exam results, each exam topic or subtopic scores for the Inbound and Outbound Exam topic or sub-topic scores are graphed with the selected aggregate pools. The respective topic benchmarks, summary table, and regression analysis are graphed for all exam topics.

For each topic or subtopic, the reported data include:

1. The Graph of the Inbound and Outbound Exam Score Comparison with the Selected Aggregates for Benchmarking
2. The Table Summary of Inbound and Outbound Exams Taken, Score Differences and Percentage Change by Examination Period
3. The Regression Analysis Graph
4. The Regression Analysis Results Table

Best Practices

Reviewing Individual Results

It is important that students give their best effort in completing the assessment, especially for the Outbound Exam. An essential component of administering the assessment is to explain the purpose of the exam to the students so that the schools can collect actionable and accurate data on student performance for programmatic evaluation and continuous improvement efforts.

- To encourage students to do their best with the Outbound Exam, an incentive is usually needed. Exam incentives include a direct grade, points, or extra credit. Another option is to assign an additional assignment when students do not meet a specific threshold. Typically, simply grading the exam is the best approach to properly incentivize the exam (see the Interpreting & Evaluating Exam Scores section).
- Individual student completion times provided in the Individual Results Report are helpful when evaluating student effort, particularly with Outbound Exam results. Typically, a 100-question exam should take the student about 60-90 minutes to complete. If exam completion times are below 30 minutes, academic officials may consider further efforts to incentivize the exam in order to get the students to take the exam seriously and thus improve results. Note: Mean completion times are provided in the Internal Analysis report. All reports can be filtered to remove results where the completion time is below a desired threshold.
- Another way to evaluate students' readiness for assessment, and their commitment to academic integrity, is to review the time students spent away from the exam window. This information is provided in the Individual Results Report.

Reviewing Cumulative Results

Topic-level scores tend to be more meaningful in terms of analysis value than the total score. Although most exams include all available topics, not all exams will include all available topics. Therefore, the total score comparisons are shown for relative benchmarking, whereas the topic and subtopic level score comparisons will tend to be more meaningful in terms of understanding relevancy of the scores.

- If there are topics included on the exam that do not appear to be directly related to your curriculum and/or learning outcomes, consider removing these topics from future testing. It is generally best not to test on topics that are not included in the program's curriculum.
- Consider the sample size for the exam period before making changes in the program based on the exam results. Lower sample sizes tend to have higher standard deviations. In general, it is best to have a sample of at least 100 exams before the results can be used for programmatic changes. Since the report period is a variable, the past exam results could be included for future reporting in order to get the sample size high enough for meaningful analysis.
- It is important not to make too many changes in a program at once based on the results of one or two exam periods. Instead, make small incremental changes to the program based on the results and then monitor the results to assess the consequences of the change effort.

Validity and Reliability

Assessment Services Test Bank Validity and Reliability

The programmatic assessment services provided by Peregrine Global Services are used to assess retained knowledge of students at the academic program level. School officials deploy these services to evaluate the effectiveness of their academic programs, identify areas for improvement, and demonstrate program outcomes to external stakeholders. Ensuring the ongoing validity and reliability of the assessment services is of upmost importance for our assessment services. These practices begin at the design stage, continue during the piloting phase, and are ongoing with the conducting of comprehensive quality reviews.

Validity refers to the extent to which the exam results are relevant and meaningful for the purpose of the exam, that is, to assess a student's retained knowledge of the program topics being assessed. Reliability refers to the extent to which the exam results are repeatable across different sets of participants, and therefore data sets can be compared over time.

Ensuring Validity and Reliability

Peregrine's assessment services incorporate the following design features that enhance both validity and reliability.

1. Exam scoring is 100% objective, using automated marking.
2. Each exam viewed by a student is unique using a random selection of questions from the test bank in random topic order.
3. Each response to a question is timed. Student activity is monitored: when the user navigates away from the exam screen, the screen fades and a [warning] message is shown.
4. Students are unable to copy/paste from the exam window.
5. Abandoned exams are excluded from summary reports.

In addition, the following specific practices are adopted. The exam services meet AICPA, Trust Services Criteria set forth in DC 200, 2018 Description Criteria for a Description of a Service Organization's System in a SOC 2® Report. This third-party auditing and reporting process is designed to provide reasonable assurance that Peregrine Global Services Corporation's service commitments and system requirements achieve the criteria relevant to security and availability set forth in TSP 100, 2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy (AICPA, Trust Services Criteria).

Ensuring Validity

The following measures are adopted when test banks are created:

- Topics and Subjects are selected to align with pertinent accreditation and/or certification requirements and related learning outcomes.
- The exam services are designed in consultation with accreditation agency officials.
- Test questions are created (and revised) by academic professionals with expertise in the relevant discipline.
- In order to ensure appropriate breadth of coverage and to enable specific learning outcomes measurement and reporting, questions are created to align with typically 4-8 Subjects for each Topic.

Once a new test bank is created, the service is piloted with clients to obtain feedback and confirm the design construct will meet the needs specific to the discipline of interest.

Client feedback is also continuously gathered and incorporated into the test bank quality review program.

Ensuring Reliability

Traditional methods for determining exam reliability are not applicable when a test bank is used to randomly generate unique tests for exam participants. In consultation with an external expert, Peregrine Global Services developed a methodology that relies upon multiple measures that collectively determines the reliability of the test bank and identifies specific questions for remediation. The measures are Item Difficulty, Item Discrimination, and Item Interchangeability. If a test bank question fails any one of the tests, the question is flagged for replacement or modification. Academic professionals are employed to revise questions and/or create replacements.

Item Difficulty refers to percentage of students who answer questions correctly. Data are generated by topic and for each individual question. The target Item Difficulty is 60 percent correct with an acceptable range of 35 – 80 percent. Questions which fall outside of this range are modified to make them less or more difficult as indicated by the data.

Item Discrimination refers to how well a question distinguishes between those students with more knowledge (higher overall exam scores) from those with less knowledge. Two measures are used: Discrimination Index and Point-Biserial Correlation.

For a given question, the Discrimination Index compares the scores of students with high overall test scores with students with low overall test scores. The scale is -1 to +1, with higher values indicating that a given question better distinguishes between high and low performing students. A value of ≥ 0.20 is considered acceptable.

Point-Biserial Correlation is equal to the Pearson's Correlation Coefficient between the scores on the entire exam and the scores on a specific question. A score of ≥ 0.10 is considered acceptable. Questions that fail either of the discrimination criteria are replaced.

Question Interchangeability refers to the ability to substitute a question in the test bank with another without significantly affecting the total score that an individual would receive on the exam. This is determined using Cohen's Effect Size d, calculated based on a two-tailed t-test comparing the total score for all students who had that question in their exam versus the total score of the students who did not have that question in their exam. The scale is 0-1.0 and a score of < 0.20 is considered acceptable. Questions that fail the interchangeability criteria are replaced.

Reference

Oedekoven, O. O., Napolitano, M., Lemmon, J., & Zaiontz, C. (2019). Determining test bank reliability. *Transactional Journal of Business, 4 (Summer 2019)*, 63-74.

Glossary of Terms

Exam Specific Terminology

Abandoned Exam. An exam that had the 48-hour time limit elapse or the 3 access attempts were exceeded. These exams are auto completed, giving the student a score of "0" for each unanswered question. These exams are only included in the school's individual results, not in the reporting or analysis.

Cohort. A group of students based upon a demographic factor such as specialization, campus location, program start date, etc.

Content of the exam. The Exam Summary document contains the list and descriptions of topics, subtopics, and subjects with a couple sample questions.

Exam. Includes all selected topics to assess a specific program. Each topic has 10 questions included within an exam, randomly selected from a validated test bank. Inbound and Outbound Exams are generated from the same test bank of questions.

Inbound Exam. A student exam administered early in the student's program, usually during their first or second core course, that measures the student's knowledge level at the beginning of their academic program.

Mid-point Exam. A student exam administered halfway in the student's program that measures the student's knowledge level at the middle of their academic program.

Outbound Exam. A student exam administered at the end of the student's academic program, usually in their last course, that measures the student's knowledge level at the end of their academic program.

Program. A program is comprised of core, required and elective courses that lead to awarding of a degree.

Statistical Terminology

Coefficient of Determination (R^2). Coefficient of determination, R squared, is a statistical measure of how well the regression line approximates the real data points. An R^2 of 1 indicates that the regression line perfectly fits the data.

Frequency of Questions Correct. For the Outbound Exam, the frequency of questions correct is calculated for each subject within a topic. The formula is: (Number of Questions Correct / Number of Questions Offered) * 100. To provide a relative index for understanding these data, an average of questions correct is shown for the aggregate pool selected for the Internal Analysis Report. To see the comparisons for other pools, the Internal Analysis Report can be re-run with a different pool selected.

Mean Completion Time. The average time, in minutes, to complete the exam. Mean completion time is also shown for each topic.

Percentage Change. The percentage change between two scores. For Inbound and Outbound testing, the percentage change is calculated using the following formula: (Outbound Score / Inbound Score) - 1.

Percentage Change Comparison. The percent difference between the school's percentage change between Inbound and Outbound Exam results and the aggregate pool's percentage change between Inbound and Outbound Exam results. The percentage change comparison represents a relative learning difference between the specific school and demographically similar schools.

Percentage Difference. The percentage difference between a school's Outbound Exam results and the aggregate, calculated using the following formula: Aggregate Score – School Score.

Longitudinal Report — Houston Christian University

Percentile. Percentiles are shown within the topic and subject level analysis based upon the frequency of questions answered correctly. The measure is used to establish relevancy of the school's score with the selected aggregate pool used for the Internal Analysis Report. The percentile benchmarks indicate to what level an average score is needed in order to be at the 80th, 85th, 90th, or 95th percentile, which school officials can subsequently use for academic benchmarking and for setting performance targets.

A **percentile** rank is the percentage of scores that fall at or below a given score and is based on the following formula: ((NumValuesLessThanScore + (0.5 * NumValuesEqualScore)) / TotalNumValues) * 100. When shown, the percentile rank of the school's exam sample of the subject/subtopic/topic score to the aggregate pool is based on using exam results within the aggregate pool grouped by school and calculated using samples of 30 exams. The percentile rank is not a ranking based on the number of individual schools included within the aggregate pool; rather it is a percentile ranking compared to the exam results included within the aggregate pool.

The **percentile benchmark** values are calculated using the Empirical Distribution Function with Interpolation based upon the Excel Function of PERCENTILE.INC (array,k). This function uses the following formula: (n-1)p=i+f: the letter i is the integer part of (n-1)p, f is the fractional part of (n-1)p, n is the number of observations, and p is the percentile value divided by 100. The percentile benchmark is the required score of questions correct to be at a specific percentile value (80th, 85th, 90th, or 95th) and is based on interpolation.

Summary Statistics. Includes the mean completion time, sample size, average score, standard deviation, and the min/max/median/mode scores.

Total Exam Score Significance. If a student simply randomly selected responses to questions, the statistical mean of the total score of such a randomly responded to exam would be approximately 30% (+/- 2.5% depending upon the number of questions on the exam). Therefore, exam scores above 30% could be considered significant in terms of measuring actual knowledge levels.

Assessment Terminology

Academic Level. The academic degree level of the program: associate, bachelors, masters, and doctoral.cables

Aggregate Pools. The aggregate pool is the data set used for external benchmarking and comparisons and is based on the results from institutions included in the selected pools. The various aggregate pools are defined as follows:

- **Pools Based on Program Delivery Modality:** Traditional, Online, and Blended.
- **Pools Based on Location:** Outside-US, Regional/Country, and Inside the US.
- **Pools Based on Institutional Characteristics:** Privately owned, Publicly owned, HBCU, Faith-based, and others.
- **Pools Based on Degree Type:** MBA, MA, MS, MHA, and MPA.
- **Pools Based on Accrediting Agency Affiliation:** AACSB, ACBSP, AMBA, IACBE, and others.

Assessment Period. The date range for the report, which includes all the exams completed within these dates. For synchronous schools, the assessment period is generally based upon the semester or quarter. For asynchronous schools, the assessment period is generally annual, semi-annual, or quarterly. School officials determine the assessment period.

External Benchmarking. Analyses performed by comparing the cumulative results from a school with a demographically similar aggregate data set.

Internal Benchmarking. Analyses performed by comparing the Inbound and Outbound Exam scores and/or by the analyses of the frequency of questions correct for each subject within a topic.