PSEO RESEARCH REPORT · 2026

Staying in the Sunshine

Developing a Talent Stickiness Index for Arizona's College Graduates

An analysis of postsecondary employment outcomes across ASU, NAU, and UA

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DATA SOURCE

U.S. Census Bureau PSEO

Postsecondary Employment Outcomes link graduates to subsequent employment records through state UI and federal earnings data.

GRADUATES

Bachelor's, Cohorts 2004–2019

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ABOUT THIS REPORT

This report introduces the Talent Stickiness Index (TSI) — a measure of how Arizona retains graduates from its three public universities across institutions, industries, cohorts, and Census regions. Findings are presented for one-, five-, and ten-year post-graduation horizons, with case studies for Health Care, Education, and Food and Hospitality.

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SECTION OVERVIEW

Executive Summary

Purpose, methods, findings, and implications

> Arizona's public universities produce graduates — the state needs to know how many of them stay. This summary presents the headline retention findings across institutions, industries, and regions, and what they imply for workforce strategy.

Executive Summary

Purpose

Arizona's public universities produce graduates. The state needs to know how many of them *stay*. State workforce strategy depends not only on degree production but on graduate retention by institution, industry, and time horizon. To address this gap, we developed the **Talent Stickiness Index (TSI)** for Arizona State University, Northern Arizona University, and the University of Arizona.

Data and Methods

We used the U.S. Census Bureau's Postsecondary Employment Outcomes (PSEO) data, which links graduates from participating institutions to subsequent employment records through state unemployment insurance and federal earnings data. PSEO reports employment counts disaggregated by institution, degree field, degree level, graduation cohort, employer industry, and employer geography. The sample included bachelor's degree graduates from ASU, NAU, and UA across six three-year cohorts (2004, 2007, 2010, 2013, 2016, 2019) at three post-graduation time horizons: one, five, and ten years. Ten-year estimates were available only for the 2004, 2007, and 2010 cohorts. We supplemented PSEO with industry employment projections from the Arizona Office of Economic Opportunity (OEO) to contextualize retention patterns against projected labor-market demand.

The Talent Stickiness Index (TSI) is defined as the share of employed graduates working in Arizona at a given time horizon, computed as a ratio of in-state employed graduates to graduates employed anywhere, bounded between 0 (complete out-migration) and 1 (complete retention). We constructed the TSI at five nested levels of disaggregation: (1) overall retention, (2) retention by institution, (3) retention by institution and 2-digit NAICS industry, (4) retention by institution, industry, and cohort, and (5) retention by institution, industry, cohort, and Census region. This nested structure enabled identification of where retention was strongest and weakest across institutional, sectoral, temporal, and geographic dimensions. The analysis is descriptive rather than causal.

Findings

Arizona retained most graduates initially but lost a substantial share over the medium term. Aggregate retention fell from roughly 70% at Year 1 to 61% at Year 5 and 58% at Year 10. The

decline between Year 1 and Year 5 was two to three times steeper than between Year 5 and Year 10, identifying the first five years post-graduation as the critical retention window for state and institutional intervention.

Institutional Differences

- **NAU** was the most stable across cohorts, holding 73–75% retention at Y1 with minimal drift and settling at 61.4% by Y10.
- **ASU** retained the largest absolute number of graduates (71.1% Y1 aggregate; 63.3% Y10) but showed the steepest cohort-over-cohort decline at Y1, from 82.6% (2004) to 62.2% (2019).
- **UA** trailed at every time horizon (48.6% by Y10) and showed the steepest decay (−16.2 pp from Y1 to Y10), a pattern consistent with its historically higher share of nonresident undergraduates (≈49% in fall 2024). UA's recent enrollment shift toward in-state students (62.5% of fall 2025 first-years) may attenuate this gap in future PSEO releases.

The Strategic Problem: Retention Where Demand was Weakest

Arizona's stickiest industries were not the industries where the state most needs workers. Utilities (85–88% at Y1) and Education (78–85% at Y1) anchor in-state retention, yet Arizona's Office of Economic Opportunity projects Educational Services to grow at only 0.3% annually through 2034 and Information to add 18 jobs statewide over the entire decade. By contrast, Health Care and Social Assistance — the state's largest projected source of new jobs (+113,466 by 2034) — showed retention that declined from the mid-to-high 70s at Y1 into the mid-50s-to-mid-60s at Y10. Information showed the most acute leakage: at UA, only 26.4% of Information-sector graduates remain in Arizona ten years out.

Food and Hospitality, despite contributing $24.2B to state GDP and 11% of the workforce, exhibited the steepest decline in the panel: UA Food and Hospitality graduates fell from 64.7% at Y1 to 33.5% at Y10, the single largest Y1–Y10 industry decline observed. Among graduates who leave Arizona, the Pacific region was the dominant destination, drawing 13% of all graduates at Y1 and rising to 16% by Y5. This was a pattern especially pronounced for UA (≈23% in the Pacific region by Y10) and concentrated in Information.

Implications for Policy and Instructional Practices

- **Target the Year 1–Year 5 window.** Retention interventions such as employer partnerships, loan repayment programs, structured early-career pathways are likely most

cost-effective when concentrated on the first five post-graduation years, where the steepest losses occur.

- **Distinguish geographic retention from occupational retention.** High in-state stickiness in Education masks attrition out of the profession itself: more than 14% of Arizona educators left in 2024–25. State workforce policy must track both.
- **Build mid-career pathways in growth industries.** Health Care and Hospitality show adequate Y1 supply but lack the management trainee programs and multi-year career ladders that convert early-career retention into decade-long Arizona careers. Re-estimating the TSI with each PSEO release would allow the state to evaluate whether these investments produce measurable retention gains.

Scope and Limitations

PSEO excludes self-employed graduates, independent contractors, and graduates working internationally, which may understate retention in fields with high self-employment. The data is limited to 2-digit NAICS resolution, masking within-sector variation, and Y10 estimates rest on three cohorts (2004, 2007, 2010). The analysis is descriptive, not causal: institutional differences reflect both program portfolios and student composition, which this study cannot separate.

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SECTION

SECTION OVERVIEW

Introduction and Context

Why talent retention matters for Arizona

State workforce strategy depends not only on degree production but on graduate retention by institution, industry, and time horizon. This section frames the problem and the questions the Talent Stickiness Index is designed to answer.

Introduction and Context

State higher education leaders are under increasing pressure to demonstrate how public investments in colleges and universities translate into long-term workforce capacity, regional economic development, and equitable opportunity for residents (SHEEO, 2023; Conzelmann et al., 2025a). Yet most state data systems can show only whether graduates are employed and how much they earn in the short term, not whether they remain in state, which sectors they fuel, or how those patterns vary across fields and institutions. At the same time, the overarching goal of every higher education institution is to equip graduates with skills and knowledge critical for success in the labor market and other positive outcomes in life (Arizona State University, n.d.). As each institution operates within a particular labor market environment, it is critical for the institution's strategy to have an objective picture of the connections between economic development, mobility and college-going. In addition to individual welfare, these connections have implications for the distribution and persistence of inequality over time as geographical mobility affects allocation of human capital, growth, and income across regions (Chetty et al., 2020).

Availability of state-wide data systems that could provide decision-makers at different levels with accurate and current information on employment flows is a timely and important concern for current state policy discussions because many states face simultaneous enrollment declines (WICHE, 2025), shifting demographic patterns, and high expectations for higher education to drive workforce and economic development strategies (SHEEO, 2023). Specifically, one of the strategic goals for the state of Arizona is to produce and retain top-tier graduates to meet the needs of employers in high-growth industries (Arizona Commerce Authority, 2023). To achieve this goal, leaders need transparent, replicable tools for understanding whether their systems retain graduates in high-need fields, where they are losing talent to other regions, and how to target investments in programs, advising, and employer partnerships (Conzelmann et al., 2025a; Miller McNeely, 2025). Effective use of postsecondary data systems, routinely collected at national level, could be a way to improve workforce alignment, inform strategies for economic development, and mitigate disparities in access, persistence, and completion through better use of outcomes data.

In this project, we used the U.S. Census Postsecondary Employment Outcomes (PSEO) data which provides a unique opportunity to address some of these challenges for the public

higher education institutions in Arizona using standardized, annually refreshed information on graduate employment flows and earnings disaggregated by institution, degree field, degree level, and cohort. We aimed to answer the following research questions:

1. How successful are Arizona public higher education institutions at retaining their graduates in strategically important industries as well as in other sectors right after graduation and over time and compared to public universities in other similar states?
2. Does the rate of retention (which we later refer to as "talent stickiness index") differ across institutions (ASU, NAU, UofA)?
3. How does the distribution of talent stickiness index differ across industries and programs of study?

We computed a measure that we are referring to as the *talent stickiness index* (TSI) which we borrowed from the field of organizational theory, where it has traditionally been used to measure an organization's ability to retain employees by tracking engagement, growth, and loyalty rather than just exit rates (Benest, 2008). Our variant of the stickiness index will differ from that definition as we will focus on graduates instead of employees, moving away from an individual organization and focusing on the state-wide retention patterns by public universities.

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SECTION

SECTION OVERVIEW

Background and Relevant Literature

Talent migration, regional retention, and state approaches

We synthesize the literature on talent migration, regional retention, and state-level workforce strategy that establishes the foundation for a PSEO-based talent stickiness framework for Arizona's public universities.

Background and Relevant Literature

Our study is situated within the larger framework of human capital theory (Becker, 1994, Burgess, 2016) and returns to higher education captured by job-degree matching and distribution of wages across industry sectors and states (Oreopoulos & Petronijevic, 2013). The majority of the current literature that studies the relationship between college enrollment and post-graduation outcomes has not addressed the mobility patterns among the graduates across labor markets and its implication for private returns to education as well as for social returns represented by economic development. Instead, existing studies focus on the markets for incoming students that higher education institutions face during the recruitment process (Aydemir et al., 2025; Hoxby & Turner, 2019; Monarrez & Washington, 2020; Sá at al., 2004; Valdebenito et al., 2025). Less is known about the labor markets (i.e., employment prospects of the graduates) and the relationship between these markets and college graduates. Limited existing findings suggest that college-goers might alter their decisions in response to changing labor market demands (Han & Winters, 2020) or fluctuations in the housing market (Goehausen & Thomsen, 2024). Recent evidence points out that graduates are more likely to stay after graduation in the same region if they were admitted to the preferred study location (Fidjeland et al., 2026). As has been noted in some of the recent studies (Conzelmann et al., 2025; Kelchen & Webber, 2018; Winters, 2020), it is critical for institutional planning and public finance to estimate and project the demands for skilled labor to align it with the supply of college graduates and to avoid losing homegrown talent to other labor markets, e.g., to other states.

States invest substantial public resources in higher education with the expectation that graduates will contribute to local economies, yet the relationship between degree production and local workforce supply is far from straightforward (Bound et al., 2004). Interstate migration of college graduates weakens the connection between where degrees are produced and where human capital accumulates, creating what researchers have termed “brain drain” (Conzelmann et al., 2025a; Fortin, 2006). For Arizona, where the Center for the Future of Arizona (2024) projected the state will need to import approximately 130,000 new workers annually if postsecondary attainment does not improve, understanding graduate retention is not merely academic, it is an economic imperative .

This review synthesizes literature across three interconnected themes: talent migration and graduate mobility, regional retention and the value of talent “stickiness,” and system-level

approaches to workforce alignment. Together, these bodies of work establish the foundation for a PSEO-based talent stickiness framework that can inform investment decisions at Arizona's public universities.

Talent Migration and Graduate Mobility

A series of studies by Conzelmann, Hemelt, Hershbein, and colleagues has fundamentally reshaped how researchers and policymakers understand where college graduates end up working (Conzelmann et al., 2023; Conzelmann et al., 2025a; Conzelmann et al., 2025b). Using LinkedIn alumni data validated against Census Bureau records, they found that approximately 50% of recent graduates work in the metro area nearest their institution and roughly 67% remain in-state (Conzelmann et al., 2025a). Geographic dispersion is twice as great for graduates of highly selective four-year institutions compared to two-year colleges, whose graduates are considerably "stickier"—83% remaining in-state (Conzelmann et al., 2025b). Critically, regional public universities produce the most graduates who stay in-state per dollar of state funding, while flagship institutions, despite higher visibility, disperse alumni more widely. Only nine states plus the District of Columbia are net importers of college graduates, underscoring the prevalence of talent leakage (Conzelmann et al., 2023).

Arizona's three public universities span this institutional spectrum in ways that make the state a particularly instructive case. ASU is classified as a very high research activity (R1) institution by the Carnegie Classification system and operates as the state's largest university, with over 145,000 students across multiple campuses and online programs (ABOR, 2026). NAU is classified as a high research activity (R2) institution and serves as a regional comprehensive university anchored in Flagstaff, with approximately 22,000 on-campus students and strong ties to northern Arizona's rural and tribal communities (ABOR, 2026). UA, also classified R1, functions as the state's land-grant institution in Tucson, with historically the highest share of out-of-state undergraduates among the three universities , approximately 49% nonresident in fall 2024 compared to 23% at NAU and a larger share at ASU driven primarily by online enrollment (ABOR, 2025). The Conzelmann et al. findings that flagship and highly selective institutions disperse graduates more widely, while regional publics produce the most stickiness per state dollar, predict that NAU should exhibit the strongest retention and UA the weakest, a hypothesis our TSI data can directly test.

These patterns exist within a broader context of declining U.S. internal migration. Partridge et al. (2012) documented reduced population responsiveness to demand shocks after 2000, suggesting structural shifts in labor markets rather than a simple spatial equilibrium. At the metro level, Betz et al. (2016) found that post-2000 growth in college-educated populations stems from agglomeration economies—bachelor's degree holders respond primarily to industry composition, while postgraduates gravitate toward urban vibrancy. Winters (2011) demonstrated that "smart cities" grow largely through student inflows, with many staying post-graduation, while Winters (2018) showed that higher local graduation rates boost metro education levels mainly through retained graduates rather than new inflows. Stephens (2019) confirmed that in-state retention varies from 50% to 70% depending on institution type, with job opportunities, amenities, and professional networks serving as key drivers. International evidence from Zhao et al. (2021) independently validated that graduate employment exhibits "strong stickiness" tied to institutional location and regional economic development.

These mobility patterns have direct implications for state investment strategies. Understanding employment flows and earnings disaggregated by institution, degree field, and cohort is essential for evidence-based decision-making in higher education (PSEO Coalition, 2025) For Arizona specifically, where the state's strategic goal is to produce and retain top-tier graduates to meet the needs of employers in high-growth industries (Arizona Commerce Authority, 2023), the gap between degree production and workforce retention represents a measurable policy challenge that PSEO data can now help quantify.

Regional Retention and the Value of "Stickiness"

The economic stakes of graduate retention are increasingly quantifiable. The Common Sense Institute (2026) estimated that each college-educated Iowan who leaves the state costs approximately $4.5 million in lifetime earnings, with Iowa's 2021 graduating cohort alone representing $17.2 million in foregone state and local tax revenue. JLL Research (2025) ranked Phoenix 17th nationally among talent hubs, noting that 36% of the Class of 2025 relocated to a different metro and 23% to a different state. Sun Belt growth patterns suggest Arizona benefits from corporate relocation trends, but faces competition from Dallas, Austin, and Florida metros. In Arizona specifically, Kim (2015) documented how the University of Arizona (UA) and Arizona State University (ASU) have been instrumental in diversifying the state's industries,

while the Arizona Auditor General (2018) reported that approximately 79% of resident students obtained in-state employment within a year of graduating compared to only 31% of nonresidents.

State labor market conditions interact with retention in complex ways. Fortin (2006) demonstrated that interstate migration weakens the connection between state-level college relative supply and the college wage premium, meaning states that invest in degree production but lose graduates see diluted economic returns. Bakoyema and Fencher (2024) found that Alabama retains in-state residents at three times the rate of nonresidents, with 57% of graduates employed in-state five years after completion. Their survey of 8,208 undergraduates revealed that social factors such as political environment, diversity acceptance, and state reputation had the largest gap between stated importance and actual impressions, suggesting that retention is shaped by quality-of-life perceptions as much as labor market conditions. Abel et al. (2014) further contextualized graduate outcomes by documenting rising underemployment, which reached 44% among recent graduates by 2012, with STEM and health fields faring better—a pattern directly relevant to understanding which Arizona graduates find aligned employment locally.

System and State Approaches to Workforce Alignment

Connecting postsecondary education to regional labor markets requires both institutional mechanisms and data infrastructure. Person and Rosenbaum (2006) found that two-year colleges with structured employer linkages produced stronger student outcomes, including higher effort and degree completion confidence. Sass et al. (2016) demonstrated the power of longitudinal administrative data systems by tracking Florida charter school students through postsecondary education and into employment, finding effects on attainment and earnings that persisted well into adulthood. Deming (2023) argued that human capital is fundamentally multidimensional; social skills complement cognitive abilities, and economic returns depend on the match between skill bundles and local labor market demand. This framework suggests that field-level stickiness patterns reflect alignment between what institutions produce and what regional economies require. State-level data integration efforts, such as Connecticut's interagency model linking K-12, higher education, and labor market records (Coelen et al., 2008), have demonstrated both the feasibility and value of tracking students into the workforce. More recently, Miller McNeely (2025) documented how states like Montana are building dashboards using PSEO data to map graduate employment outcomes by institution, field, and geography.

Gaps in Literature and Opportunities for PSEO-Based Research

The existing literature establishes a robust foundation but reveals significant gaps. Most studies rely on cross-sectional snapshots or aggregate state-level data, lacking the institution-specific, field-specific, longitudinal tracking that PSEO now enables. The relationship between retention and state investment has been theorized (Bound et al., 2004; Fortin, 2006), but rarely operationalized at the institution level. Indiana remains the only state with a performance-based funding metric explicitly tied to graduate retention (Common Sense Institute, 2026). A PSEO-based talent stickiness framework for Arizona's public universities would address these gaps by providing disaggregated, longitudinal retention data at one-, five-, and 10-year intervals, enabling ABOR to assess which institutions and programs produce graduates who stay, which fields exhibit the highest leakage, and how stickiness patterns align with regional workforce demand.

04

SECTION

SECTION OVERVIEW

Data and Methods

Data sources, sample, and the Talent Stickiness Index

We describe the U.S. Census PSEO data and Arizona Office of Economic Opportunity projections used in this report, and detail how the Talent Stickiness Index (TSI) is constructed across institutions, industries, cohorts, and Census regions.

Data and Methods

Data Sources

Our approach in this report is primarily descriptive. We leveraged publicly available data from two main sources to construct a new database, which we used for the analysis of patterns and trends in the retention of college graduates in the state of Arizona. Our first source of data is the U.S. Census Bureau's postsecondary employment outcomes data—PSEO. That data includes (1) employment flows, which provide counts of graduates by institution, degree field, degree level, and graduation cohort, linked to the geographic location and industry of their main employer; and (2) earnings outcomes, which provide 25th, 50th, and 75th percentile annual earnings one, five, and ten years after graduation for the same groups. The data is currently available in increments of three years (cohorts) for 2001 through 2019 for students graduating with a Bachelor's degree and five years (cohorts) for students graduating with a Masters or Doctoral degree. PSEO currently contains data on employment outcomes for graduates from 33 states with coverage ranging from 3% (District of Columbia) to 87% (Virginia).

The second source of the data are publicly available employment projections from Arizona's Office of Economic Opportunity (OEO), whose estimates draw on Bureau of Labour Statistics Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW) data. We used these state-level industry projections to contextualize PSEO-based retention trends and to develop simple, scenario-based projections of how Arizona's graduate flows align with expected labor-market demand. These projections were used descriptively rather than for formal forecasting, with attention paid to assumptions and limitations to maintain transparency and appropriate use.

Methods

To address our research questions, we first developed a *talent stickiness index* (TSI) for Arizona's public universities using PSEO data. The TSI is a ratio between the students who graduated from one of the three Arizona institutions in a given cohort with a Bachelor's degree who found employment in the state and students who graduated and found employment in any state. We disaggregated the PSEO data by institution (ASU, NAU, and UA), NAICS 2-digit industry-sector code (Appendix A, Table 1), graduate cohort year for students graduating with a bachelor's degree (2004 - 2019), time horizons (Y1, Y5, and Y10), and regional flows (Appendix A, Table 2). We computed the TSI by considering the number of graduates who

found employment in the state of Arizona one, five, and ten years after graduation. We used the following formula to construct the TSI:

$$TSI_{i,s,c,t} = \frac{E^{instate}_{i,s,c,t}}{E_{i,s,c,t}}$$

Where *i* denotes institution ($i \in$ {ASU, NAU, UA}), *s* denotes industry sector ($s \in$ {2-digit NACIS}), *c* denotes graduation cohort year ($c \in$ {2004, 2007, 2010, 2013, 2016, 2019}), and *t* denotes the time horizon ($t \in \{1, 5, 10\}$ years post-graduation). Additionally, $\{E^{instate}_{i,s,c,t}\}$ denotes the count of graduates employed in Arizona at time *t* and $\{E_{i,s,c,t}\}$ denotes the count of graduates employed anywhere at time *t*. Therefore, TSI $\in$ [0, 1], where 1 = complete retention and 0 = complete out-migration.

The index allowed us to quantify the share of employed graduates in industry working in-state, neighboring states, and other regions; to identify fields and programs where the state is a net exporter or importer of talent; and to link these patterns to earnings trajectories one, five, and ten years after graduation. This latter set of metrics refers to what we call "earning-adjusted stickiness".

We created five key variables within the TSI that we used as leveled indicators for talent stickiness: 1) overall retention; 2) retention by institution; 3) retention by institution and industry; 4) retention by institution, industry, and cohort; and 5) retention by institution, industry, cohort, and region (Appendix A, Table 3). Using these five indicators, we captured retention flows at different levels of talent stickiness, providing more precise measures for how Arizona has retained its talent across institutions, industry, time horizon, and region.

Through our analysis of state priority occupation and workforce needs, we identified the strategically important industry sectors to further our exploration via case studies. These industry sectors included Health Care, Education, Food and Hospitality, and Information Technology. We have provided a case study of each industry sector in the findings section.

05

SECTION

SECTION OVERVIEW

Findings

Overall, by institution, by industry, and by region

Findings are presented at five nested levels of disaggregation: overall, by institution, by institution and industry, by cohort, and by Census region — at one-, five-, and ten-year post-graduation horizons.

Findings

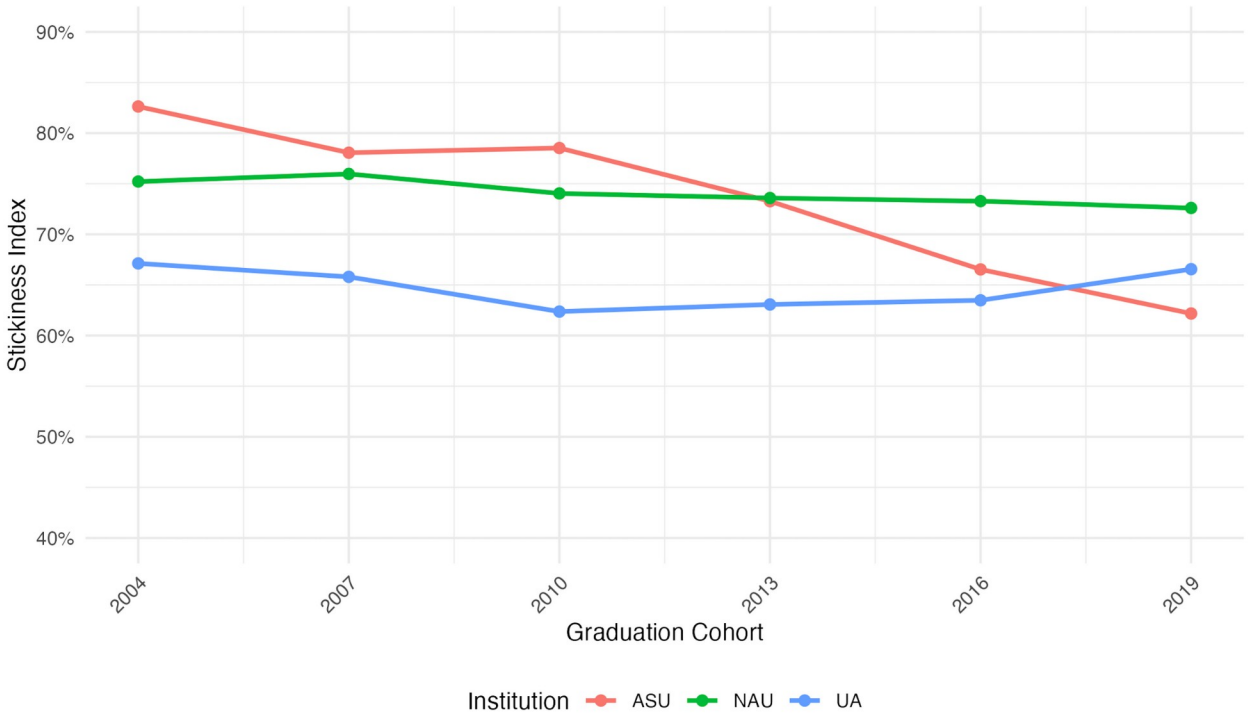
Overall retention

For overall retention one-year post-graduation, ASU has the highest aggregate Y1 stickiness (71.1%), but it also sees the steepest decline among cohorts, from 82.6% (2004) to 62.2% (2019). NAU is the most stable institution among cohorts in the panel, hovering around 73–75% retention with minimal drift. UA starts at the lowest point for Y1 (67.1% in 2004), but shows the most consistent upward trend, reaching 66% by 2019 and converging with ASU. All three institutions converge notably by the 2016-2019 cohorts. In 2004, the gap between ASU and UA was approximately 15 percentage points, which was inverted by 2019, where UA led ASU by approximately four percentage points in overall retention one-year post-graduation (Figure 1).

These retention trends take on added significance in the context of Arizona's projected employment growth. The Arizona Office of Economic Opportunity (OEO) projects total state employment to increase from 3,496,247 jobs in 2024 to 3,950,414 in 2034, an addition of 454,167 jobs at 1.2% annual growth, significantly outpacing the projected U.S. rate of 0.3% (OEO, 2025). The state's capacity to fill these positions depends in part on whether its public universities retain graduates in the industries driving that growth.

Figure 1

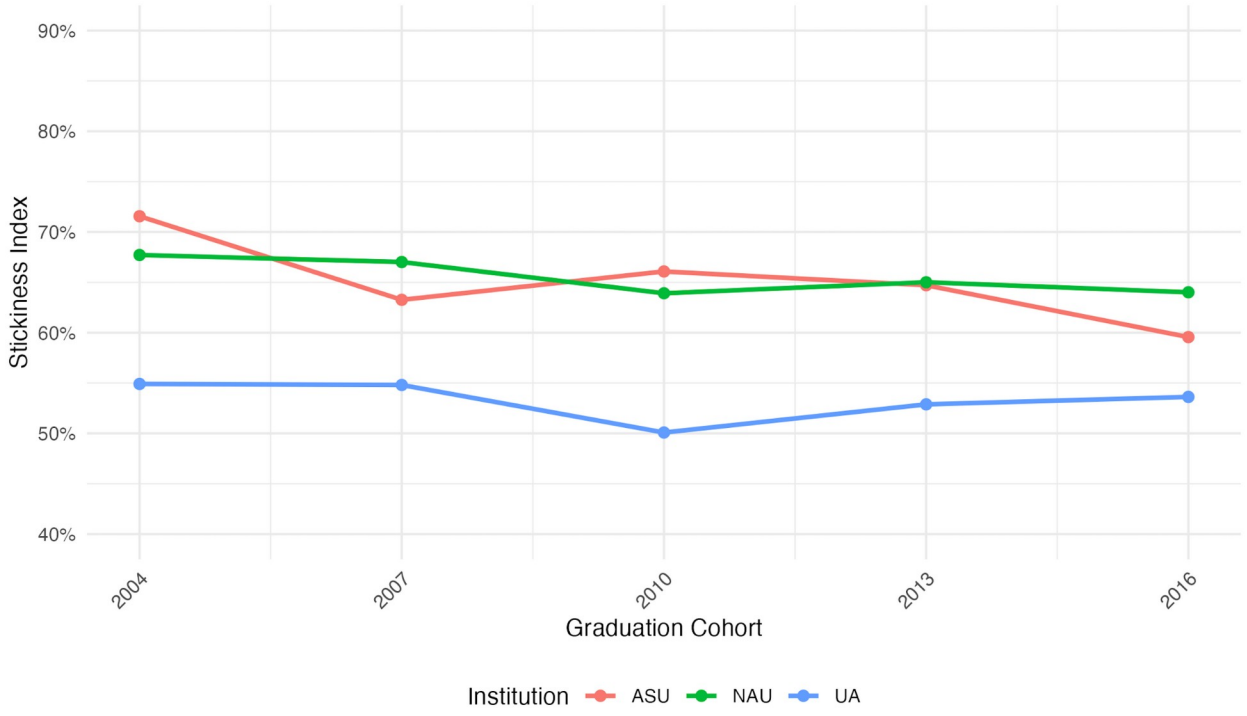
Arizona TSI one-year post-graduation



Overall retention five years after graduation shows lower stickiness than one-year, suggesting that post-graduation out-migration from Arizona may accelerate over time. ASU experiences the sharpest decline in overall retention five years after graduation, reducing from 71.6% (2004) to 59.6% (2016). As with the Y1 overall retention rates, NAU's retention rate holds steadily five years post-graduation, moving from 67.7% (2004) to 64.0% (2019). UA holds steadily as well, decreasing slightly from 54.9% (2004) to 53.6% (2019). UA does not overtake ASU in the five year post-graduation data, as it does in year-one. Although the trends do suggest that the gap between the ASU and UA is narrowing and could invert when the next PSEO panel is available for analysis. These five year trends do not drift much from the trends in one year post-graduation (Figure 2)

Figure 2

Arizona TSI five-years post-graduation



Data for overall retention patterns 10 years post-graduation were only available for 2004, 2007 and 2010, limiting any interpretation in the pattern. UA's aggregate stickiness 10 years after graduation is noticeably lower (48.6% aggregate) than ASU (63.3%) and NAU (61.4%). This suggests that UA's graduates are more likely to leave the state of Arizona 10 years after post-graduation than ASU and NAU's graduates. This pattern is consistent with UA's enrollment composition: in fall 2024, approximately 49% of UA's undergraduates were nonresidents, compared to 23% at NAU (ABOR, 2025). The Arizona Auditor General (2018) found that only 31% of nonresident graduates obtained in-state employment within a year of graduating compared to 79% of residents, suggesting that UA's higher out-of-state enrollment stare mechanically depresses its aggregate stickiness. While we cannot isolate the causal contribution of enrollment origin without individual-level data, the magnitude of the gap between UA and ASU, nearly 15 percentage points at Y10, aligns with this enrollment-composition explanation. Finally, ASU and NAU's aggregate stickiness of 10 years post-graduation are similar, despite the differences in one year and five year retention rates for both institutions.

Industry Patterns

One Year Post-Graduation

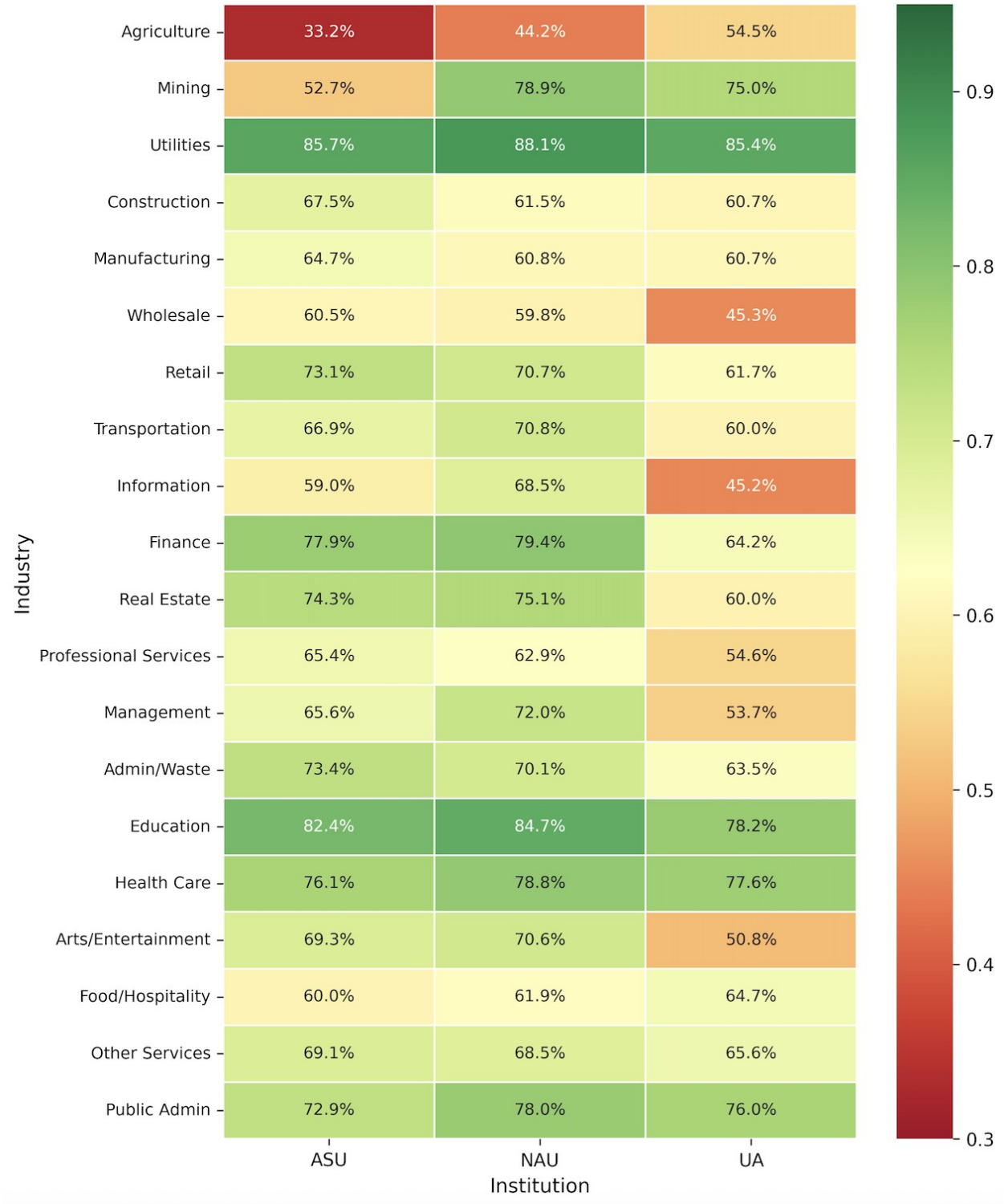
Next, we computed the talent stickiness index for all 20 industries included in the North American Industry Classification System (NAICS) 2-digit code in the PSEO data. We computed industry trends across all cohorts and industries for one, five, and ten years post-graduation and have included some of the Y1 findings below.

Across all cohorts for one year post-graduation, Utilities remains the stickiest industry for all three institutions, ranging from 88.1% at NAU to 85.7% for ASU and 85.4% for UA. Education is the second stickiest industry for all three institutions. ASU retains 82.4% of its graduates who seek employment in education in Arizona, while NAU retains 84.7% and UA retains 78.2% of its graduates respectively. The trends for the least "sticky" industry diverge by institution, specifically for UA. The least sticky industry for both ASU and NAU is Agriculture (33.2% and 44.2% respectively). For the UA, the least sticky industry is Information (45.2%) with the Agriculture sector retaining 54.5%. Notably, only 59.0% of ASU graduates employed in the Information sector are working in Arizona, meaning four in ten Information-sector ASU graduates are employed out of state. For reference, we have included a heatmap with industry comparisons across institutions for one year post-graduation (Figure 3).

The industry-level retention patterns are particularly consequential when viewed against Arizona's projected labor market needs. OEO's 2024–2034 projections identify Health Care and Social Assistance (2.1% annual growth, +113,466 jobs over the decade) and Construction (2.1% annual growth, +51,798 jobs) as the industries with the strongest projected growth rates in the state (OEO, 2025). Accommodation and Food Services is projected to add 42,442 jobs at 1.3% annually, and Manufacturing 29,435 jobs at 1.4%, both supported by Arizona's continued population growth and expanding semiconductor industry. Notably, the industries where Arizona retains the highest share of graduates (Utilities and Education) are among those with the weakest projected growth: Educational Services is projected at just 0.3% annually (+8,278 jobs over the entire decade), and Information is projected to add only 18 jobs statewide through 2034, effectively flat (OEO, 2025). This means Arizona's strongest retention is concentrated in industries with the least projected demand growth, while the industries that most need workers (Health Care, Construction, and Hospitality) show moderate-to-weak retention that erodes over time.

Figure 3

Talent stickiness index by institution and industry (Y1 aggregate, all cohorts)



Five Years Post-Graduation

Five years post-graduation retention declines across all institutions, but the magnitude varies and the declines are concentrated in precisely the industries where Arizona OEO projects the greatest future demand.

ASU is the most stable institution across all industries and all cohorts from one year to five years post-graduation. ASU's retention declines 6.6 percentage points from year one to year five, NAU drops 8.6 percentage points, and UA decreases 11.6 percentage points, nearly double ASU's, signaling that whatever drives UA's lower initial stickiness compounds over time.

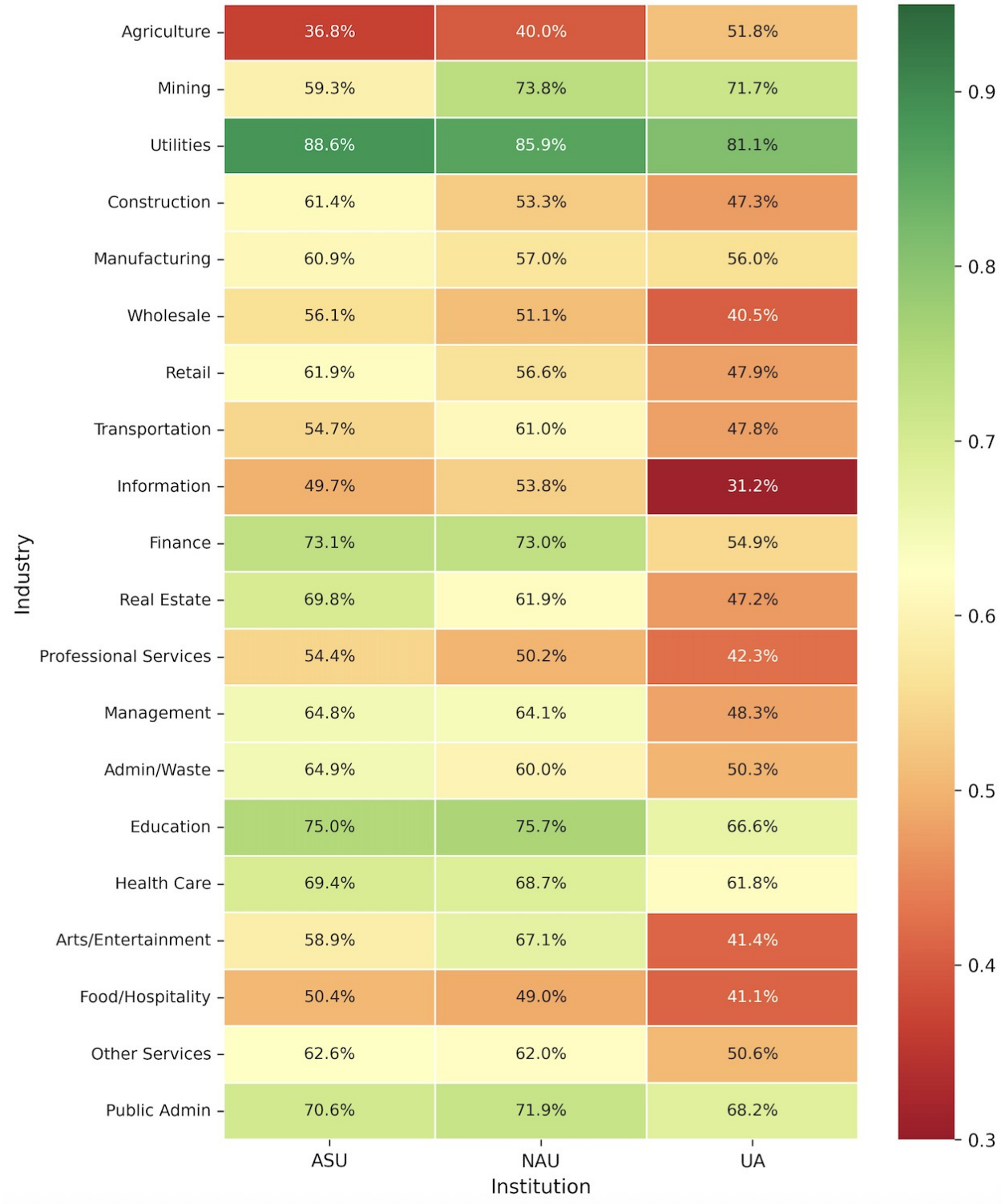
Utilities (88.6%) and Education (75.0%) persist as the two stickiest industries for ASU graduates across all cohorts five years post-graduation. Similarly, Agriculture (36.8%) continues to be the least sticky industry for ASU graduates five years post-graduation. Finally, for ASU, the Information industry declines approximately 10 percentage points from 59.0% to 49.7% one to five years post-graduation.

In keeping with the five year pattern for ASU, NAU's two stickiest industries – Utilities and Education – also persist from one year to five years post-graduation. 85.9% of NAU's graduates who found work in the Utilities industry are retained in Arizona, while 75.7% of NAU's graduates who found work in the Education sector are retained five years post-graduation. Once again, Agriculture (40.0%) is the least sticky industry for NAU.

UA's two stickiest industries across all cohorts five years after graduation are Utilities (81.1%) and Education (66.6%). The least sticky industry for UA is Information (31.2%), which is the lowest Y5 institution-industry cell in the panel. As with the one year trends, UA trails ASU and NAU in the majority of industries, with Information experiencing a 14 percentage point decline from one year to five years post-graduation.

Figure 4

Talent stickiness index by institution and industry (Y5 aggregate, all cohorts)



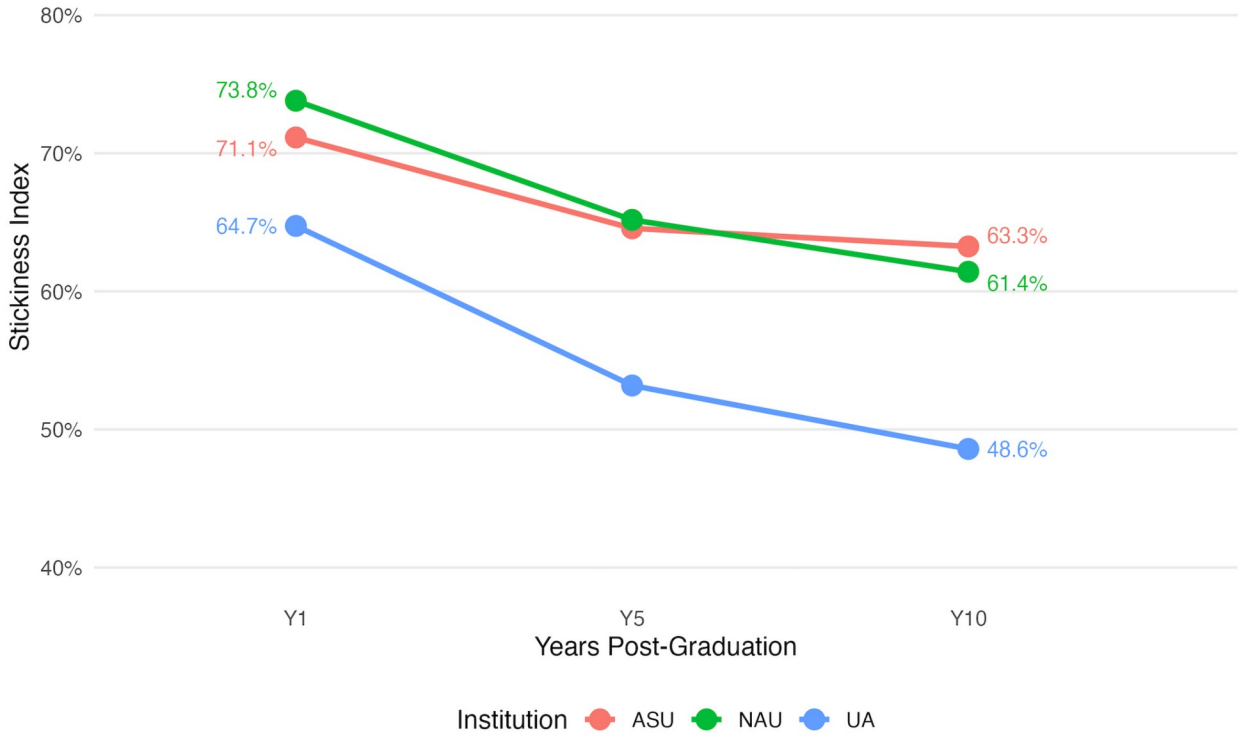
10 Years Post-Graduation

For retention flows ten years after graduation, only 2004, 2007, and 2010 cohort years were available. This is the smallest sample of cohorts (three), meaning that graduates from 2004-2010 are the sole population represented in the ten year graduation panel.

Once again, ASU is the most stable across all three institutions across all industries and cohorts from five years to 10 years post-graduation. ASU's retention rate declined by 1.3 percentage points during that time period, while NAU dropped by 3.8 percentage points, and UA dropped by 4.6 percentage points. Interestingly, these are the lowest rates of decline in the panel, suggesting a relatively stable labor market in terms of retaining Arizona's graduates from five to 10 years after they have graduated from ASU, NAU, or UA. This trend signals that the rate of decline for Arizona graduates is most critical from one to five years post-graduation. While 10 years post-graduation does see decline, it is not as significant as the rates of decline during the first five years after a student graduates with a bachelor's degree from any of Arizona's three major institutions.

Figure 5

Arizona Graduate Talent Stickiness by Institution



The retention rate from one year to 10 years after graduation displays a much steeper decline than the one to five year retention rate and the five to 10 year retention rate. ASU's retention rate decreased by 7.9 percentage points, while NAU dropped by 12.4 percentage points, and UA declined by 16.2 percentage points. UA consistently trails behind both ASU and NAU in every longitudinal trend analysis.

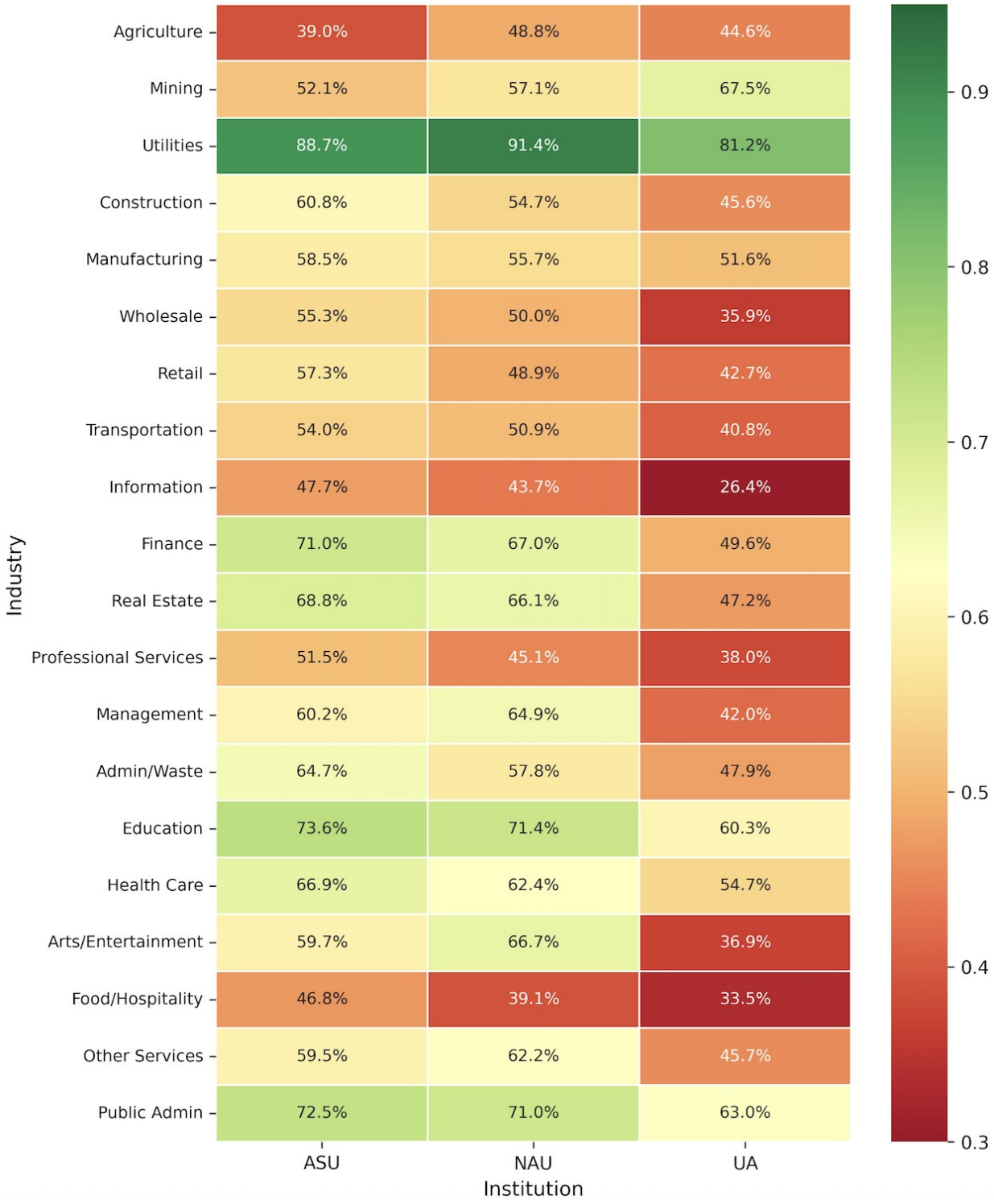
Utilities (88.7%) and Education (73.6%) continue to be the stickiest industries for ASU graduates across all cohorts 10-years post-graduation, while agriculture remains the least sticky industry (37.0%). It is worth noting that ASU is the most stable institution across all three time horizons (Y1, Y5, and Y10).

For NAU, Utilities (91.4%) remains the stickiest industry. This is the single highest institution-industry-time horizon cell in the panel, signaling NAU's strong track record of retaining graduates in the Utilities sector ten years after they graduate. It is also the only cell that increases from the five year to the 10 year time horizon. Education (71.4%) is the second stickiest industry, while Food and Hospitality (39.1%) is the least sticky. This signals a shift away from agriculture as the least sticky industry for NAU graduates 10 years post-graduation.

UA continues its trend, with Utilities (81.3%) and Education (60.3%) as the two stickiest industries across all cohorts 10 years post-graduation. UA's least sticky industry is Information (26.4%), meaning that approximately three in four of UA's information graduates have left the state ten years after they have graduated. UA shows the steepest decay in retention among all three institutions. For example, Information declined nearly 19 percentage points from one-year to ten-years post-graduation. This warrants further analysis on UA's out-migration compared ASU and NAU, where retention rates are more tightly clustered.

Figure 6

Talent stickiness index by institution and industry (Y10 aggregate, all cohorts)



Regional Flows

One year post graduation

Overall, the graduates from three Arizona public universities had a high propensity to remain in Arizona - on average, 70% of graduates with Bachelor degrees were employed in Arizona one year after graduation. Figure 1 represents the employment flows after graduation broken down by institution and region of employment (for the definition of regions, please see Table 5 in Appendix). As seen from the table, about the same share of graduates from the three universities find jobs in the Mountain region (73% on average) and are employed in that region one year after graduation. A significant share of those employed in the Mountain region are those who are employed in Arizona. The next region where the graduates from Arizona public universities are more likely to find jobs is the Pacific region (13% on average). This is not surprising as one of the neighboring states there - California - also supplies a large share of enrolled students. The remaining share of graduates (14%) is equally distributed across other regions with East South Central employing the lowest fraction, less than 1%.

Disaggregating the employment flows by the institution, NAU has the highest retention rate both in Arizona and in the region, 74% and 78% correspondingly, followed by ASU with 71% and 74%. U of A has the lowest stickiness with 65% of its graduates employed in the state and 68% in the region.

Trends in employment flows by regions followed approximately the same pattern over time. For six cohorts of graduates available in the data (2004, 2007, 2010, 2013, 2016, 2019), the observed stickiness in Arizona ranged from 62% to 83%. Out of three universities, NAU had the most stable pattern of retention with a range of stickiness index from 73% to 76%. The NAU retention rate has decreased over time. This is also true for ASU and UA. While UA had the lowest values of stickiness index overall, ASU has experienced the largest and most consistent decline in retention of its graduates in the state from 2004 to 2019. Specifically, the retention rate dropped from 83% for the 2004 cohort to 62% for the 2019 cohort.

Next, we analyzed the employment patterns of graduates from all three universities by region and industry (see the list of industries by NAICS code in Table 1 in Appendix). Three industries with the highest retention rate - both in state and in region - were utilities, followed by educational services and healthcare and social assistance.. On average, 86% of graduates were employed in the utilities sector in Arizona one year after graduation. 82% of those who were

employed in education services after graduation stayed in Arizona, 84% in Mountain region, 6% were employed in the Pacific region, and 10% elsewhere. 80% of graduates employed in healthcare had their jobs in the Mountain region and 77% in Arizona. Other industries with high stickiness in Arizona and the Mountain region include public administration (75%), finance and insurance (75%), real estate (71%), and retail trade (70%). Similar to the aggregated trend, Pacific was the region where the second largest share of the graduates was employed - 55% in agriculture and fishery, 24% in information, management of companies and enterprises (19%) and real estate (19%) followed by construction (18%), accommodation and food services (18%), and professional, scientific, and technical services (18%).

Five years post graduation

Five years after graduation, 62% of all graduates from Arizona public universities remained employed in the state, and 66% were employed in the Mountain region. This represents a 7 to 8 percent decline in retention rate compared to the first year after graduation. 3% more were employed in the Pacific region, from 13% one year after graduation to 16% five years after. The rest of the graduates previously employed in the Mountain region and Arizona - proportionally moved to other regions.

Disaggregating by institution, the highest outflow of talent five years after graduation was among UA graduates. Only 53% of them were employed in the state and 58% in the Mountain region compared to 65% (12% drop) and 68% (10% drop) one year after graduation. 4% more of the graduates moved to the Pacific region increasing the share of UA graduates there to 21%. 2% of the graduates moved to the West South Central region where the share of UA graduates was 5%.

NAU retained 65% of its graduates in Arizona and 72% in the Mountain region - decrease of 9% and 6% correspondingly. 14% of NAU graduates were employed in the Pacific region five years after graduation - 2% more than one year after with the rest of the outflow of talent equally distributed across other regions.

ASU lost the smallest share of talent five years after graduation compared to other institutions - 6% left the state and 5% the Mountain region. The patterns of outflow were similar to NAU and UA -increase in share of graduates in the Pacific by 3% with the rest of the graduates adding the workforce in other regions.

10 years post graduation

Ten years after graduation Arizona experienced about 4% of its graduates leaving the jobs in the state compared to five years after and 12% compared to one year after graduation. The Mountain region remained the main destination for Arizona graduates employing 64% or almost two thirds of them ten years after graduation. Only 2% of the graduates left employment in the region compared to five years after graduation and 1% of them were employed in the Pacific region.

Both UA and NAU lost about 4% of the graduates to other regions. UA retention rate both in state and in the Mountain region declined and was the lowest 10 years after graduation - 49% in state and 54% in the region. 2% of the graduates moved to the Pacific region where almost a quarter (or 23%) of all UA graduates were employed ten years after graduation. NAU stickiness in the state and the Mountain region remained substantially higher compared to UA - 61% in the state and 69% in the region. Unlike UA graduates, NAU graduates increased their employment presence in the South Atlantic region (2% more) and in the Central regions. Finally, ASU graduates retained the strongest presence in the state workforce - 63% losing only 2% to other regions, specifically to East North Central and West North Central. They also remained represented in the Mountain region with 68% retention rate.

Figure 7

Regional Graduate Flows by Institution – All Industries, All Cohorts

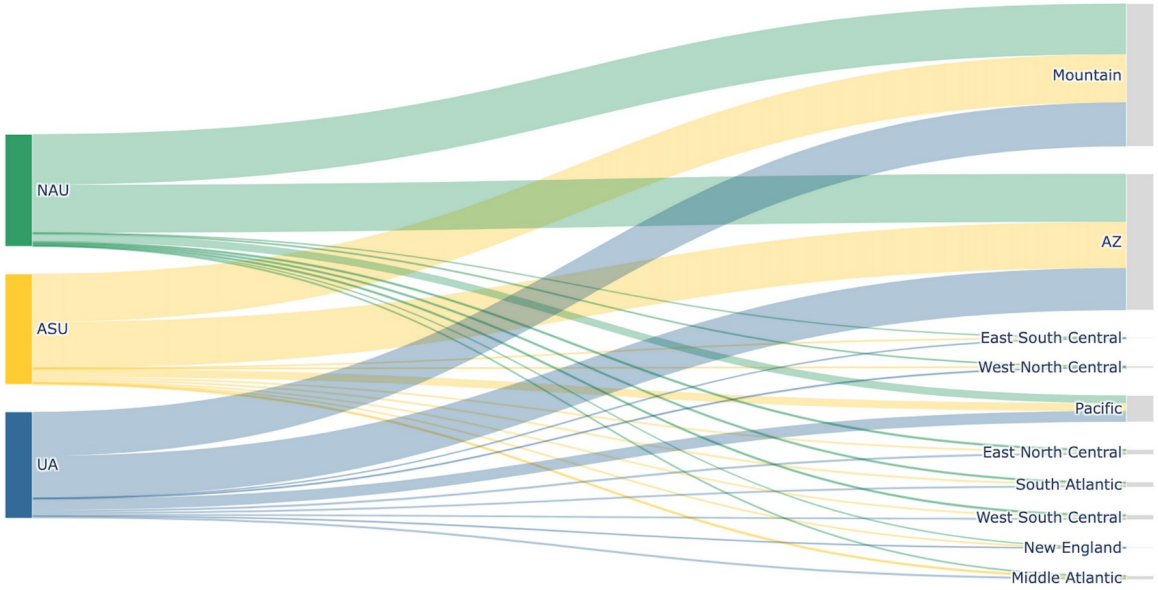


Figure 8

Regional Graduate Flows — Five Stickiest Industries (All Institutions)

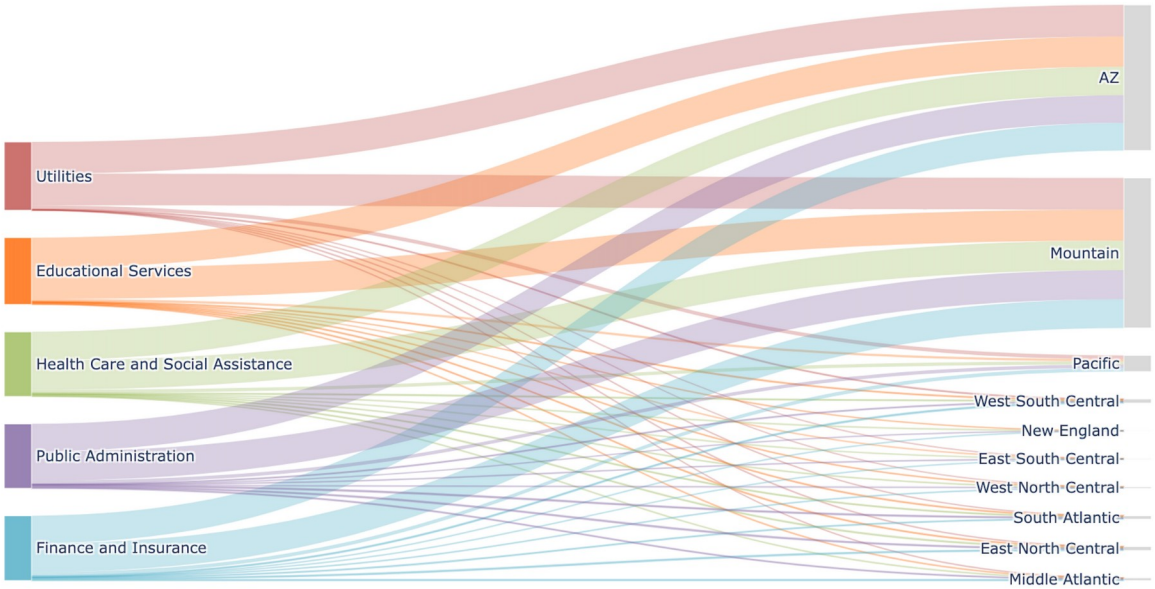
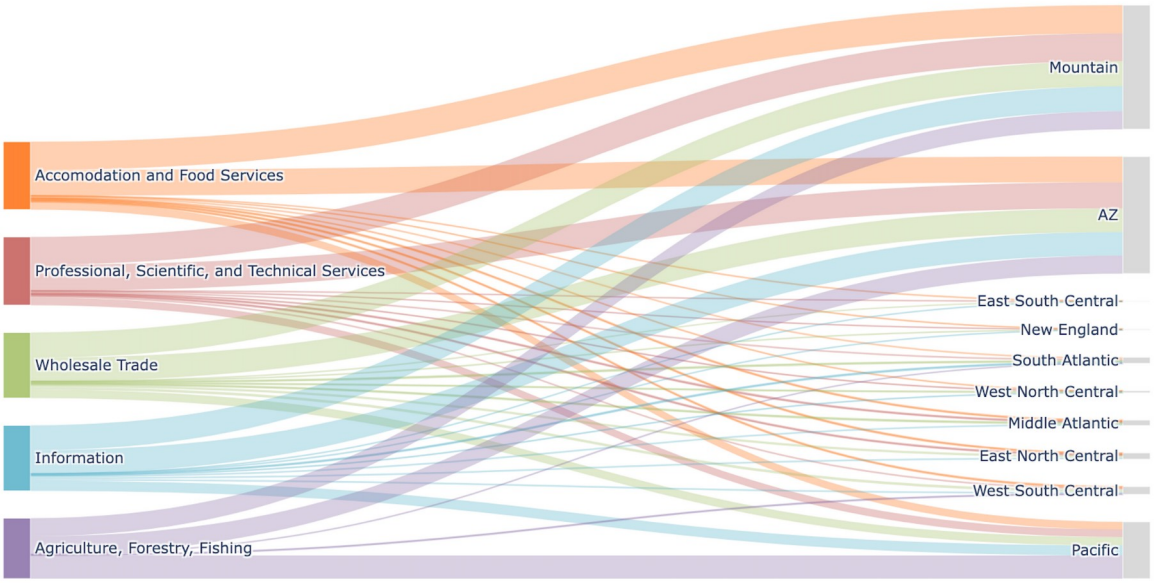


Figure 9

Regional Graduate Flows — Five Least Sticky Industries (All Institutions)



06

SECTION

SECTION OVERVIEW

Case Studies

Health Care, Education, and Food and Hospitality

Three industry case studies translate the TSI into actionable workforce insight, pairing retention patterns with industry context, replacement demand, and engagement opportunities for employers and policymakers.

Case Studies

We will now turn our attention to three industry-specific case studies that provide important context for Arizona's priorities in workforce development as well as the dynamic between in-state graduate rates, labor market demands, and industry out-migration. The first industry we will focus on is Health Care, where Arizona has a long history of workforce shortages, especially in rural areas where health care services are essential to the wellbeing of Arizona's rural communities (Arizona Center for Rural Health, 2024; Arizona Department of Health Services, 2024). Arizona ranks ninth in the nation for the most health professional shortage areas, with 65% of primary care HPSAs designated as medically underserved; the state currently meets only 40% of its primary care physician needs, and by 2032, is projected to be short 4,679 registered nurses, 412 nurse practitioners, and 4,131 physicians (Arizona Health Workforce Initiative, 2024). OEO projects Health Care and Social Assistance to add 113,466 jobs between 2024 and 2034, making it the state's largest source of projected new employment at 2.1% annual growth (OEO, 2025). The combination of rapid demand growth and the decline of graduate retention over time makes Health Care a critical case for understanding whether Arizona's university system is producing talent that stays long enough to meet this demand.

The second industry we will focus on is Education, where Arizona retains a high share of graduates who find employment in education across all three institutions. Even with this high retention rate, teacher shortages exist across the state (Arizona Department of Education, 2026; Learning Policy Institute, 2025), particularly in schools that serve a disproportionately high population of students of color, students experiencing economic disadvantages, and English language learners. The number of Arizona teachers not fully certified for their assignments increased by more than 60% between 2020–21 and 2023–24, reaching 8,229 (Learning Policy Institute, 2025), and more than 14% of Arizona educators left the profession in 2024–25, with burnout, lack of respect, and student behavior cited as primary drivers (Arizona Department of Education, 2026). OEO projects Educational Services to add only 8,728 jobs over the entire 2024-2034 decade, a growth rate of just 0.3% annually, among the slowest of any Arizona industry (OEO, 2025). This means the education workforce challenge is less about creating new positions and more about replacing the educators who leave.

The third industry we will focus on is Food and Hospitality. Arizona's tourism and hospitality sector is a cornerstone of the state economy, contributing $24.2 billion to Arizona's gross domestic product in 2022—roughly 6.4% of all economic activity—and directly or indirectly supporting approximately 347,500 jobs, or 11% of the state's total workforce (Common Sense Institute, 2023). The restaurant industry alone is the third-largest private employer in Arizona, with over 324,900 food service jobs across more than 12,500 locations and $31.6 billion in annual sales (National Restaurant Association, 2025). Phoenix's hotel industry generates $7.2 billion in economic activity and supports over 42,000 direct and indirect jobs (American Hotel & Lodging Association, 2026). National park visitors in Arizona spent $1.4 billion in communities near parks in 2024, contributing $2.2 billion to the state economy (National Park Service, 2025). Despite the sector's enormous economic footprint, Arizona does not retain as many of its graduates in Food and Hospitality as the Health Care and Education industries. In particular, the Food and Hospitality industry shows a steep decline in retention across all three institutions five and ten years after graduation. OEO projects Accommodation and Food Services to add 42,442 jobs through 2034 at 1.3% annual growth, with the broader Leisure and Hospitality supersector adding 55,725 jobs (OEO, 2025). The gap between the sector's economic importance and its low graduate retention rate underscores a potential vulnerability in Arizona's workforce pipeline for one of its most labor-dependent industries.

Health Care

Across all cohorts, 76.1% of ASU graduates were retained in the Health Care industry in the state of Arizona one year post-graduation, 69.4% were retained five years post-graduation, and 66.9% were retained 10-years post-gradition. For NAU, 78.8% of its graduates were retained in the Health Care industry in the state of Arizona one year post-graduation, 68.7% were retained five years post-graduation, and 62.4% were retained 10-years post-graduation. Finally, 77.6% of UA graduates were retained one year post-graduation, 61.8% five-years post-graduation, and 54.7% 10-years post graduation (Table 1). All three institutions show strong one-year retention, clustered between 76-79%, which were among some of the highest performing industries in the panel for years one, five, and 10. NAU led all three institutions (78.8%) one year post-graduation but showed the steepest decline from year-one to year-five, decreasing by approximately 10 percentage points.

Table 1

Healthcare Graduate Talent Stickiness Index by Institution and Time Horizon (Aggregate Cohort, 2004–2019)

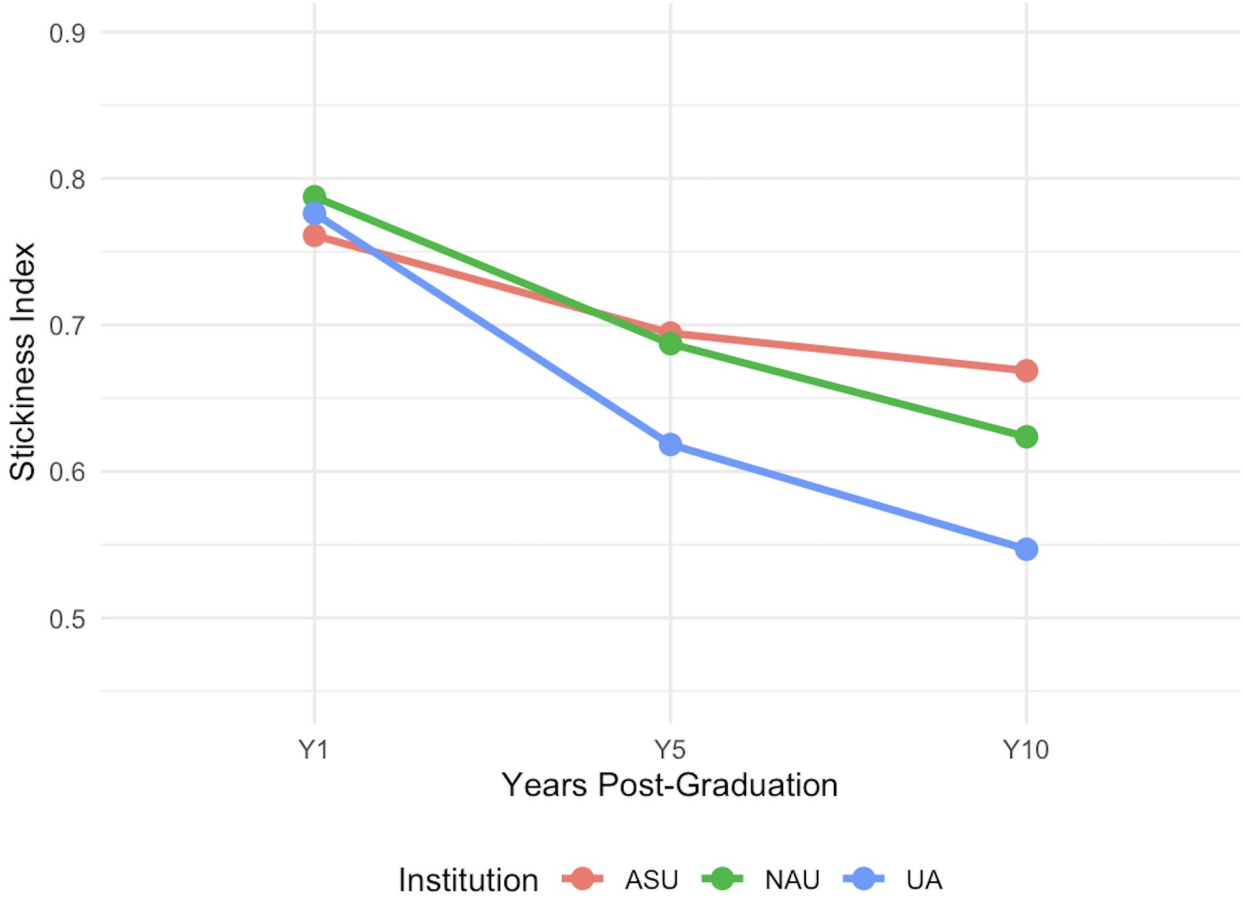
Institution	Y1	Y5	Y10
ASU	76.1%	69.4%	66.9%
NAU	78.8%	68.7%	62.4%
UA	77.6%	61.8%	54.7%

Note. Values represent the proportion of employed graduates retained in Arizona at each time horizon. Data source: U.S. Census Bureau Postsecondary Employment Outcomes (PSEO), 2004–2019 graduation cohorts.

In terms of decline, UA represented the most dramatic decay from one year to 10 years post-graduation, dropping from 77.6% to 54.7%, accounting for a roughly 20 percentage point decrease between the two time horizons. In contrast, ASU was the most stable across the three time horizons, losing approximately nine percentage points from one year to ten years post-graduation. By Y10, a gap widens between ASU (66.9%) and UA (54.7%).

Figure 10

***Healthcare Graduate Talent Stickiness by Institution*, Aggregate Cohort, Y1/Y5/Y10**



OEO's projection of 113,466 new Health Care jobs over the next decade means Arizona needs a steady pipeline of healthcare workers just to keep pace with demand growth, before accounting for retirements and attrition (OEO, 2025). With all three institutions' Health Care TSI declining from the mid-to-high 70s at Y1 to the mid-50s-to-mid-60s at Y10, the state faces a compounding problem: not only is demand growing faster than in most other sectors, but the share of university-produced healthcare talent that remains in Arizona is shrinking over time.

Education

Across all cohorts, 82.4% of ASU's graduates were retained in the Education industry in the state of Arizona one year post-graduation, 75.0% of graduates were retained five years post-graduation, and 73.6% were retained 10 years post graduation. For NAU, 84.7% of their graduates were retained in the education industry one year post-graduation, 75.7% five years,

post-graduation, and 71.4% 10 years post-graduation Finally, across all cohorts, 78.2% of UA's graduates were retained one year post-graduation, 66.6% five years post-graduation, and 60.35% ten years post-graduation.

Table 2

Education Graduate Talent Stickiness Index by Institution and Time Horizon (Aggregate Cohort, 2004–2019)

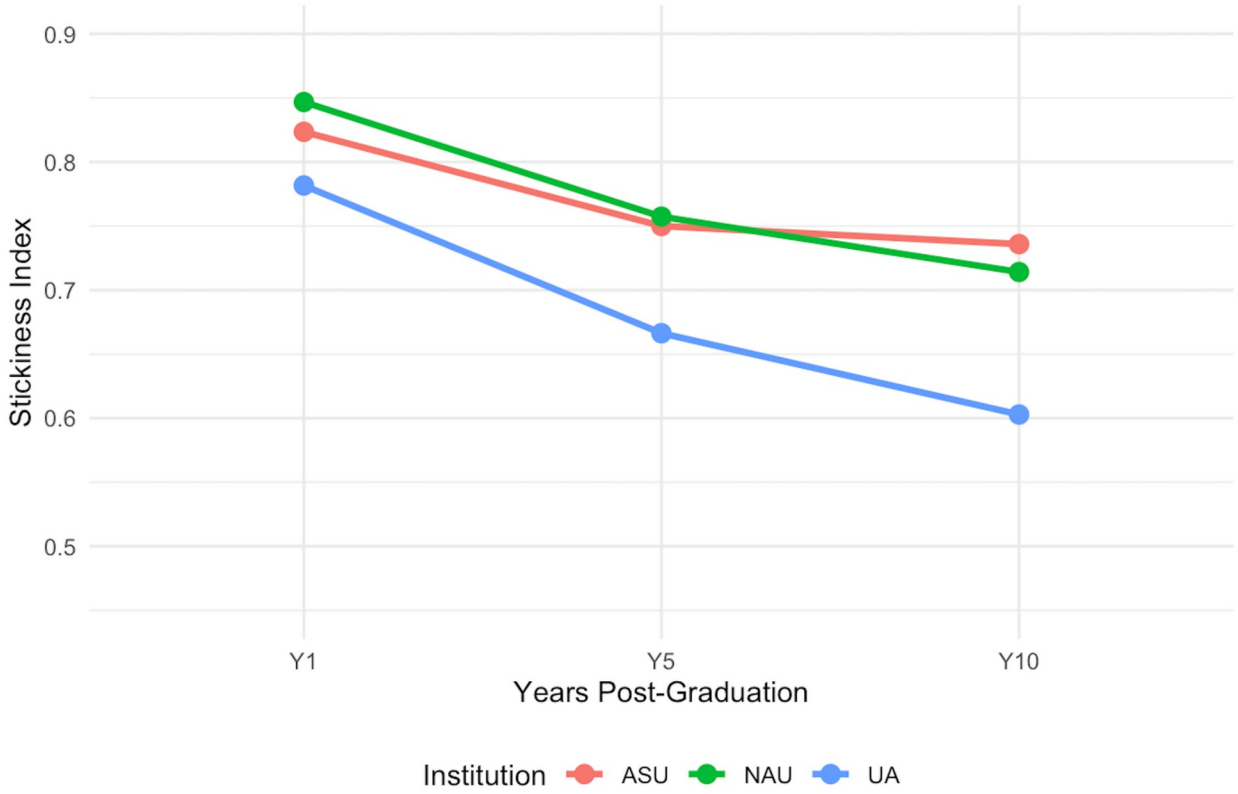
Institution	Y1	Y5	Y10
ASU	82.4%	75.0%	73.6%
NAU	84.7%	75.7%	71.4%
UA	78.2%	66.6%	60.3%

Note. Values represent the proportion of employed graduates retained in Arizona at each time horizon. Data source: U.S. Census Bureau Postsecondary Employment Outcomes (PSEO), 2004–2019 graduation cohorts

As mentioned above, all three institutions demonstrated the strongest retention of any industry in the panel, clustered between 78-85%. NAU led all three institutions one year post-graduation (84.7%) and maintained the highest retention through five years (75.7%). Much like the Health Care sector, UA represented the steepest decline, from 78.2% one year post-graduation to 60.3% ten years post-graduation, dropping approximately 18 percentage points. ASU and NAU remained clustered ten years post-graduation, while UA trailed by more than 10 percentage points. Even with UA's steep decline, education still remained the second-strongest performing industry in terms of talent stickiness one-, five-, and ten-years after graduation across all cohorts.

Figure 11

***Education Graduate Talent Stickiness by Institution*, Aggregate Cohort, Y1/Y5/Y10**



Food/Hospitality

Across all cohorts, 60.0% of ASU graduates were retained in the Food and Hospitality industry in the state of Arizona one year post-graduation, 50.4% were retained five years post-graduation, and 46.8% were retained 10 years post-graduation. For NAU, 61.9% of its graduates were retained in the Food and Hospitality industry one year post-graduation, 49.0% five years post-graduation, and 39.1% 10 years post-graduation. Finally, 64.7% of UA graduates were retained one year post-graduation, 41.1% five years post-graduation, and 33.5% 10 years post-graduation (Table 3). Unlike Healthcare and Education, where retention rates clustered in the mdi-to-high 70s and 80s at Y1, Food and Hospitality retention begins at a substantially lower baseline. None of the three institutions retain even two-thirds of their Food and Hospitality graduates one year post-graduation. UA led all three institutions at Y1 (64.7%), reversing the typical pattern where UA trails ASU and NAU in industry-level retention, but experiences the steepest decline thereafter.

Table 3.

Food and Hospitality Graduate Talent Stickiness Index by Institution and Time Horizon (Aggregate Cohort, 2004–2019)

Institution	Y1	Y5	Y10
ASU	60.0%	50.4%	46.8%
NAU	61.9%	49.0%	39.1%
UA	64.7%	41.1%	33.5%

Note. Values represent the proportion of employed graduates retained in Arizona at each time horizon.. Data source: U.S. Census Bureau Postsecondary Employment Outcomes (PSEO), 2004–2019 graduation cohorts.

In terms of decline, UA experienced the most dramatic decay from one year to 10 years post-graduation, dropping from 64.7% to 33.5% accounting for a 31.2 percentage point decrease which is the largest single-industry decline in the entire panel. NAU followed closely with a 22.8 percentage point decline from 61.9% to 39.1% while ASU showed relative stability with a 13.2 percentage point decline from 60.0% to 46.8%. By year 10, fewer than half of Food and Hospitality graduates from any Arizona institution remained employed in the state, and the institutional hierarchy observed in Health Care and Education reasserts itself, ASU retained the largest share (48.8%) while UA retained the smallest (33.5%). This trajectory stands in contrast to Education, where all three institutions retained over 60.0% of graduates at Y10, and to Health Care, where retention remained above 54% at Y10.

Figure 12

***Food and Hospitality Graduate Talent Stickiness by Institution*, Aggregate Cohort, Y1/Y5/Y10**

07

SECTION

SECTION OVERVIEW

Discussion

What the patterns mean for workforce strategy

> We discuss the implications of the findings across institutions, industries, and regions — with particular attention to where Arizona is a net exporter or importer of graduate talent, and what those patterns suggest for state strategy.

Discussion

Arizona's talent stickiness data reveal a state that retains the majority of its public university graduates in the short term but loses a meaningful share over the medium and long term. The rate of that loss varies sharply by institution, industry, and time horizon. At the aggregate level, approximately 70% of bachelor's degree graduates from ASU, NAU and UA are employed in Arizona one year after graduation, but this declines to roughly 61% by year five and settles near 58% by year ten. Institutionally, NAU demonstrates the most stable retention across cohorts, ASU retains the largest absolute number of graduates but shows the steepest cohort-over-cohort decline at Y1, and UA consistently trails both institutions at every time horizon. We attribute this pattern in part to its higher share of nonresident graduates (ABOR, 2025).

The Y1 to Y5 period represents a critical retention period. Since the rate of decline during these first five years is two to three times steeper than the Y5 to Y10 decline, this suggests graduates who remain in Arizona who remain in Arizona through year five are substantially more likely to stay long-term. This has direct implications for the timing of retention interventions. Employer partnerships, loan repayment programs, and career pathway development may be most effective if targeted at graduates within their first five years post-graduation. While factors such as housing availability and affordability almost certainly shape these decisions, our data do not allow us to directly test their contribution to out-migration, so we treat them as contextual considerations rather than measured drivers of stickiness.

The industry-level analysis adds critical nuance. Utilities and Education are the stickiest industries system-wide, with rates above 70% even at Y10 for ASU and NAU. At the other end, Agriculture and Information Technology show the weakest retention, with IT declining to just 26.4% at Y10 for UA, meaning that three in four UA IT graduates have left Arizona a decade after graduating. Between these industries, strategically important industries like Health Care and Food and Hospitality show moderate initial retention but different long-term trajectories. These patterns have direct implications for workforce planning, as the industries showing steepest talent leakage are among those Arizona's Office of Economic Opportunity projects will need the most workers over the next decade.

The three case studies reveal distinct patterns in Arizona's ability to retain graduates across strategically important industries, each with implications for workforce development and state investment.

Health Care

Given Arizona's healthcare shortages in rural areas, NAU's role as a northern Arizona regional institution and UA's role as a southern regional institution make the Y5 and Y10 declines particularly noteworthy. These are graduates who are most likely to join rural healthcare systems and Arizona's failure to retain these graduates five- and ten-years post-graduation may be exacerbating the state's healthcare access crisis Arizona ranks ninth nationally for health care professional shortage areas, with the state currently meeting only 40% of its primary care physician needs (Arizona Health Workforce Initiative, 2024). The finding that ASU demonstrates the most stable healthcare retention, losing only nine percentage points from Y1 to Y10, may reflect the Phoenix metropolitan area's larger and more diversified health system, which offers more competition compensation and career advancement opportunities than rural settings.

Education

Education is the stickiest industry across all three institutions, which aligns with the localized nature of k-12 teaching labor markets, teachers are typically employed within commuting distance of where they are trained (Boyd et al, 2005). Yet even with the highest retention rates in the panel, Arizona faces a deepening teacher shortage. The number of teachers not fully certified for their assignments increased by more than 60% between 2020-21 and 2023-24 (Learning Policy Institute, 2025), and more than 14% of educators left the profession in the 2024-25 school year (Arizona Department of Education, 2026). This means that high stickiness in education reflects geographic retention but masks the broader challenge. Arizona retains its education graduates in-state, but the profession itself is losing them to burnout, insufficient compensation, and working conditions. UA's steeper education attrition, dropping 18 percentage points from Y1 to Y10 warrants further investigation into whether Tucson-area school districts face distinct retention challenges compared to the Phoenix metro and northern Arizona communities served by ASU and NAU graduates.

Food and Hospitality

Food and Hospitality shows the steepest retention decline of any industry examined in the three case studies, with all three universities losing double-digit percentage points of their graduates between Y1 and Y10 (ASU -13.2 pp, NAU -22.8 pp, UA -31.2pp). UA's decline is the largest Y1 to Y10 decline in the entire industry panel. This pattern is consistent with the occupational structure of the sector: careers in hotel operations, restaurant management, and resort and event services are typically built across multiple geographic regions, and national hospitality brands often require relocation as a condition of advancement (Common Sense Institute, 2023: American Hotel & Lodging Association, 2026). Unlike Education, which anchors to place by the localized nature of K-12 labor markets, and unlike Health Care, where state licensure and local health systems reward staying put, Food and Hospitality careers reward mobility, and the retention data reflect that. What makes the Arizona case notable is the mismatch between this outflow and the economic weight of the sector. Tourism and Hospitality contribute $24.2 billion to Arizona's GDP and support roughly 347,500 jobs, approximately 11% of the state's total workforce (Common Sense Institute, 2023). And OEO projects that state will add 42,442 Accommodation and Food Service jobs through 2034 (OEO, 2025). Arizona's public universities produce a steady supply of entry-level hospitality talent (60-65% retention across the three institutions), but the state appears to lack the structured mid-career pathways such as management trainee programs and multi-year career ladders that could convert early-career to decade-long Arizona careers.

Across all three case studies, UA consistently shows the steepest retention decay, trailing ASU and NAU at every time horizon in Health Care, Education, and Food and Hospitality. In our data, this pattern is specific to these three sectors and should not be interpreted as a comprehensive assessment of UA's overall academic portfolio. Instead, it highlights fields where UA appears to face comparatively greater challenges in retaining graduates, which may warrant closer attention from ABOR and institutional leaders. This raises a strategic question for the state: should retention strategies focus on increasing UA's in-state enrollment share, thereby shifting the overall composition of graduates to those with stronger ties to Arizona, or on strengthening post-graduation employment outcomes and employer partnerships to retain out-of-state students who chose to attend UA? It is worth noting that UA has recently begun shifting its enrollment strategy toward a higher share of Arizona residents. In-state students rose to 62.5% of

the fall 2025 first-year class, up from 52.7% in 2024 (University of Arizona, 2025) and future PSEO releases will reveal whether this shift translates into stronger retention.

08

SECTION

SECTION OVERVIEW

Limitations and Conclusion

Scope, caveats, and a path forward

> We close with the scope and limitations of PSEO-based analysis, the headline conclusions of the Talent Stickiness Index, and directions for future research and applications.

Limitations

There are three important limitations to PSEO's dataset that influenced our empirical analysis at this stage of the study. First, PSEO data excludes certain categories of workers, including many self-employed individuals and independent contractors whose earnings are not reported through unemployment insurance systems, as well as graduates working outside of the United States. This means that our index only captures the stickiness of these graduates from Arizona's three major institutions who found covered employment. As a result, our estimates of retention do not reflect the full outcomes for graduates who pursue self-employment, contract work, or international careers, and may underestimate stickiness for programs that are more likely to send students into those paths.

We constructed the *TSI* for each three-year cohort graduating with bachelor's degrees spanning from 2004 through 2019, providing us with six time horizons to longitudinally track the *TSI* by institution. Second, PSEO does not capture NAICS codes beyond the 2-digit level, so we could not develop the index beyond aggregate level industry measures at this stage in the analysis. Finally, the 10-year retention data is only available for 2004, 2007, and 2010, limiting generalizability.

Conclusion

Using U.S. Census Bureau Postsecondary Employment outcomes (PSEO) data spanning 2004 to 2019 graduation cohorts in Arizona, this study constructed a Talent Stickiness Index (TSI) to measure the share of employed bachelor's degree graduates from Arizona State University, Northern Arizona University, and the University of Arizona who remained employed in Arizona one, five, and ten years post-graduation. The TSI revealed a number of important longitudinal trends for talent retention among Arizona's three largest universities. In aggregate, Arizona retained most of its graduates in the short term (Y1) but lost a meaningful share of its talent over time. The aggregated decline from approximately 70% one year post-graduation to approximately 60% ten years after graduation represents a substantial loss of talent for the state of Arizona. Furthermore, this rate of loss was not uniform across all institutions. According to our TSI, ASU was the most stable of the three institutions one, five, and ten years post-gradation, while UA showed the steepest decay. Our analysis also revealed that industry matters as much as institutions. Utilities and Education were consistently the stickiest industries across all time horizons and institutions, while Information and Food and Hospitality were the least sticky. Regional flows revealed that the Pacific region was the dominant destination for out-of-state graduates particularly in Information. We also found that stickiness declined monotonically across graduation cohorts from 2004 to 2019, independent of industry and institution—potentially signaling a greater rate of decline of talent loss in the future for Arizona. Finally, UA consistently retained fewer graduates than ASU and NAU, demonstrating the steepest decay one year to ten years post-graduation and the highest out-of-state flow to the Pacific region. This suggests hidden structural factors may be at play that the PSEO dataset has yet to capture, warranting further analysis. As Arizona continues to invest in higher education, it is essential that institutions pay close attention to the long-term trends in talent retention captured through PSEO data.

Future Research and Applications

The patterns documented in this study suggest several directions for future research. First, because PSEO is updated periodically, repeating the Talent Stickiness Index at regular intervals would allow Arizona's institutions and policymakers to track whether retention improves as enrollment strategies, employer partnerships, and state policies change. Second, future research could use this framework by examining additional 2-digit NAICS industries and drilling more deeply into fields where retention appears to be especially strong or weak. Finally, as more states participate in PSEO, other systems could adopt the TSI framework, enabling cross-state comparisons and a stronger research base on how individual institutions and higher education systems contribute to talent migration.

09

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Cited literature and data sources

> Full citations for the literature, data products, and policy reports referenced throughout the report.

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Appendix

Supporting tables and supplementary analysis

Detailed tables and supplementary analysis supporting the figures presented in the Findings and Case Studies sections.

Appendix

Table 1

NAICS Codes used in analysis

NAICS Code	Industry Description
11	Agriculture, Forestry, Fishing and Hunting
21	Mining, Quarrying, and Oil and Gas Extraction
22	Utilities
23	Construction
31-33	Manufacturing
42	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information
52	Finance and Insurance
53	Real Estate and Rental and Leasing
54	Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
56	Administrative and Support and Waste Management and Remediation Services
61	Educational Services
62	Health Care and Social Assistance
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (except Public Administration)
92	Public Administration

Note. NAICS = North American Industry Classification System. Industry codes and descriptions sourced from the U.S. Census Bureau (2022). Data retrieved from the Census Bureau Longitudinal Employer-Household Dynamics (LEHD) Postsecondary Employment Outcomes (PSEO) program.

Table 2

Talent Stickiness Index Disaggregated Measures

Dimension	Values	Description	Index
Institution	ASU, NAU, UA	Identifies which Arizona public university produced the graduates.	Allows TSI comparisons across institutions with different enrollment profiles and labor market contexts.
NAICS industry sector	Two-digit NAIC codes	Classifies the industry in which graduates are employed.	Reveals which sectors retain vs. lose Arizona-trained talent.
Graduation cohort year	2004-2019	Groups graduates by the year they completed their degree.	Enables tracking of how in-state retention has shifted across successive cohorts.
Time horizon	Y1, Y5, Y10	Measures retention at one, five, and 10 years post-graduation.	Captures whether graduates who initially stay in Arizona remain over the long term.
Region/geography	Nine U.S. Census Divisions	Identifies the destination geography of employed graduates.	Mountain division represents in-state Arizona retention, while other divisions indicate where graduates are going.

Table 3

Leveled Indicators

Level of Disaggregation	What it Measures
All institutions	Arizona's overall capacity to retain publicly educated bachelor's graduates in its workforce one, five, and 10 years post-graduation.
Institution	Key differences in college graduates retention for Arizona's three major institutions one, five, and 10 years post-graduation.
Institution x industry	Which industries in Arizona's labor market absorbs and retains college graduates in each of Arizona's three major institutions one, five, and 10 years post-graduation.
Institution x industry x cohort	Differences in how graduating cohorts from 2004-2019 enter Arizona's labor market for each of Arizona's three major institutions.
Institution x industry x cohort x region	The geographic distribution of Arizona's outmigration for graduating cohorts entering specific industry sectors in the labor market across all three of Arizona's major institutions.

Table 4

Talent Stickiness Index for Select Industries by Institution and Time Horizon (Aggregate Cohort, 2004–2019)

	ASU				NAU				UA			
Industry	**Y1**	**Y5**	**Y10**	**Δ Y1–Y10**	**Y1**	**Y5**	**Y10**	**Δ Y1–Y10**	**Y1**	**Y5**	**Y10**	**Δ Y1–Y10**
Utilities	85.7%	88.6%	88.7%	**3.0%**	88.1%	85.9%	91.4%	**3.3%**	85.4%	81.1%	81.2%	**-4.2%**
Construction	67.5%	61.4%	60.8%	**-6.7%**	61.5%	53.3%	54.7%	**-6.8%**	60.7%	47.3%	45.6%	**-15.1%**
Manufacturing	64.7%	60.9%	58.5%	**-6.2%**	60.8%	57.0%	55.7%	**-5.1%**	60.7%	56.0%	51.6%	**-9.1%**
Transportation*	66.9%	54.7%	54.0%	**-12.9%**	70.8%	61.0%	50.9%	**-19.9%**	60.0%	47.8%	40.8%	**-19.2%**
Health Care	76.1%	69.4%	66.9%	**-9.2%**	78.8%	68.7%	62.4%	**-16.4%**	77.6%	61.8%	54.7%	**-22.9%**
Food and Hospitality*	60.0%	50.4%	46.8%	**-13.2%**	61.9%	49.0%	39.1%	**-22.8%**	64.7%	41.1%	33.5%	**-31.2%**

*Note. Values represent the proportion of employed graduates retained in Arizona at each time horizon. Y10 data is available for 2004 and 2007 cohorts only. Δ Y1–Y10 = percentage point change from one-year to ten-year post-graduation. Industries selected based on Arizona Office of Economic Opportunity 2024–2034 employment projections. *Transportation and Warehousing and Accommodation and Food Services are components of the OEO "Trade, Transportation and Utilities" and "Leisure and Hospitality" supersectors, respectively, and are reported here at the two-digit NAICS level. Data source: U.S. Census Bureau Postsecondary Employment Outcomes (PSEO), 2004–2019 graduation cohorts.*

Table 5

Definition of Regions - U.S. Census Divisions

Region	Division	States
Northeast (1)	New England (1)	Connecticut (09) Maine (23) Massachusetts (25) New Hampshire (33) Rhode Island (44) Vermont (50)
	Middle Atlantic (2)	New Jersey (34) New York (36) Pennsylvania (42)
Midwest (2)	East North Central (3)	Illinois (17) Indiana (18) Michigan (26) Ohio (39) Wisconsin (55)
	West North Central (4)	Iowa (19) Kansas (20) Minnesota (27) Missouri (29) Nebraska (31) North Dakota (38) South Dakota (46)
South (3)	South Atlantic (5)	Delaware (10) District of Columbia (11) Florida (12) Georgia (13) Maryland (24) North Carolina (37) South Carolina (45) Virginia (51) West Virginia (54)
	East South Central (6)	Alabama (01) Kentucky (21) Mississippi (28) Tennessee (47)
	West South Central (7)	Arkansas (05) Louisiana (22)

		Oklahoma (40) Texas (48)
West (4)	Mountain (8)	Arizona (04) Colorado (08) Idaho (16) Montana (30) Nevada (32) New Mexico (35) Utah (49) Wyoming (56)
	Pacific (9)	Alaska (02) California (06) Hawaii (15) Oregon (41) Washington (53)