# Gold Plated Handcuffs? Moves, Exits and Retirements from Research-Intensive Universities

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**Abstract:**

This paper examines the factors associated with faculty mobility in the fields of biomedicine, chemical engineering, chemistry, computer science, economics, electrical engineering and psychology at 272 research-intensive universities. Using data from Academic Analytics and the State Higher Education Executive Officers Association, we examine the observable characteristics associated with faculty mobility. Not all moves take place for the same reasons. Movements across the 272 research-intensive universities are positively selected on research productivity, whereas exits and retirements are negatively selected. Furthermore, the likelihood of moving or exiting differs depending on academic rank, field, and years since PhD. Next, we limit our sample to faculty who are first observed employed at a public university. Using a budget shock instrument to control for the potential endogeneity of state funding, increases in state funding significantly reduce job move by about 4% and retirements by 2.5%. We found that the fields of biomedicine, economics and electrical engineering are the most responsive to state funding. Given the low rates of mobility for tenured faculty, we conclude that tenure is a gold-plated handcuff that limits mobility for all but the most productive faculty.

**JEL Codes:** I22, I23, I28, J62

**Key words:** Science, Faculty, Mobility, Higher Education, State Funding

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Although many researchers have examined the international flow of scientists (Franzoni, Scellato & Stephan 2012, 2014; Sugimoto et al 2017), fewer studies have examined the determinants of academic mobility across research universities within the United States. Furthermore, not all moves are created equal. Some faculty may be recruited to institutions because of their high research productivity, whereas others may not receive tenure and be asked to leave. Given the end of mandatory retirement in academia, the scientific workforce is aging rapidly (Blau and Weinberg 2017). In some cases, faculty may pay to remain on the job by forgoing Social Security and retirement income payments that are actually higher than their current salary (National Academy of Sciences 2013). Yet few researchers have examined the characteristics associated with faculty retirement, despite this being an important issue to universities.[1] Interacting with all of these decisions are the financial conditions of university employers. In particular, state funding for public universities has varied widely across states and years. This paper examines how research productivity and the funding of public universities are associated with faculty moves, exits, and retirements. We find that moves are positively selected, while exits and retirements are negatively selected.

There are few studies of faculty mobility across U.S. institutions. Azoulay, Ganguli, and Graff Zivin (2017) found that prolific life scientists were more likely to move. However, it is not known whether this is true of faculty in other research fields. Others have found that faculty mobility increases research productivity (Halevi, Moed and Bar-Illan 2016 and Aknes et al 2013, Ham, Quistorff & Weinberg 2025). Using ORCID data, Yan, Zhu & He (2020) examine tenure-stream faculty mobility in the United States. They find that faculty move to institutions with higher research productivity and to those located in urban areas. However, ORCID is not a

[1] A Google search of "faculty retirement" featured a list of websites hosted by the provost's office at various universities about faculty retirement incentive plans.

representative sample of faculty, and their study is more descriptive in nature. Questions remain about the determinants of mobility.

Other researchers have examined the impact of mobility on faculty salaries. Barbezat and Hughes (2001) find no impact of initial mobility on faculty salaries. In contrast, Monks and Robinson (2001) find that people who were tenured and move to a new institution have higher salaries than those who received tenure without moving.

*The Role of State Funding*

Researchers have estimated that state budget shocks have reduced enrollment and degree completion in affected states (Deming and Walters 2017). Although universities have some discretion to raise tuition, many states have imposed tuition caps (Deming and Walters 2017). Webber (2017) has estimated that higher education institutions can only pass through 32% of higher education cuts in the form of tuition increases. Blume-Kohout Kumar and Sood (2009, 2015) found that increased federal funding was associated with increased non-federal science funding, but we are not aware of research that has carefully investigated the consequences of substantial state funding reductions for higher education institutions on federal R&D support or on the resultant impacts on the quantity and quality of research output.

Most Science of Science Policy research has focused on the role of federal funding in research productivity. However, states have cut higher education funding to public universities for the past decade. The State Higher Education Executive Officers Association (SHEEO) provides an annual report of state higher education finance (SHEEO 2018). Table 1 lists the states that have cut higher education appropriations significantly since the Great Recession and through 2016. Several of these states have cut taxes in addition to cutting state funding for higher education.

The data in Table 1 prompt us to consider whether state higher education budget shocks also affect faculty mobility at public universities. It could be that state funding increases result in increasing demand for faculty, prompting moves. Alternatively, financial difficulties at higher education institutions could lead to faculty dissatisfaction and turnover. In 2016, the *Milwaukee Journal-Sentinel* reported that the University of Wisconsin-Madison spent $9 million dollars to retain 40 faculty "stars" that competing universities had tried to lure away. Had the faculty left the university, $18 million dollars in research funds would have left with them. According to the report:

> Campus officials said they have seen an increase in the number of professors entertaining job offers from other universities since state lawmakers last summer cut $250 million from the UW System's 2015-'17 budget, weakened layoff protections for tenured faculty and reduced the role of faculty governance in campus decisions. (Herzog 2016)

Whether state funding increases are associated with more or less faculty mobility remains an open, empirical question.

We begin our analysis by differentiating job mobility as moves across research intensive universities, exits from the research-intensive university sample, and retirements measured as exits 30 years after completing the PhD. Compared to other tenure stream faculty at four-year institutions and non-academics with doctorates in the same field, job changes are four times lower at research institutions compared to non-academic doctorates. Using a series of descriptive regressions that examine the association between the job mobility outcomes and university characteristics, academic rank, and research productivity. The results show that job moves are positively selected. Individuals with greater research productivity are significantly more likely to move. However, exits from research-intensive universities and retirements are negatively selected. As research productivity increases those exits decrease. When we limit the

sample to public research universities, increases in state funding are positively associated with all kinds of job mobility. This is also shown in our fixed effects models.

We then use a budget shock instrument to examine the causal impact of state funding on job mobility. Our IV estimates cause the state funding variable to switch signs. Increases in state funding significantly reduce job move by about 4% and retirements by 2.5%. When we examine these effects by field, we found that the fields of biomedicine, economics and electrical engineering are the most responsive to state funding. Ours is one of the first studies to link faculty mobility to the state funding of universities. In circumstances where funding per student falls over time, our results suggest that the more accomplished research faculty will leave. The next section discusses the data and methods, followed by results, and then the discussion and conclusion.

**Data and Methods**

To conduct this study we use data from Academic Analytics and the State Higher Education Executive Officers Association (SHEEO). Academic Analytics (AcadA) is a private company that collects data on university faculty and their research output including publications, citations and federal research grants. We use data from 2009 – 2022 to examine faculty mobility patterns as a function of research productivity. We limit the AcadA data to the top 272 funded research universities in the United States. In addition, we limit our analysis to the science fields of biomedicine, chemical engineering, chemistry, computer science, economics, electrical engineering, and psychology.

At first glance assigning people to fields and institutions should be relatively straight forward, but the AcadA data is somewhat complicated. Since the academic year does not align the calendar year, individuals can have two institutional affiliations within the same year. We

used a series of decision rules to determine whether an individual moved institutions. In particular if a person was listed as having affiliation A in year 1; affiliations A and B in year 2 and affiliation B in year 3, we coded that person as moving in year 2. In some cases, a person reported multiple affiliations for several years, and we Googled these researchers and used online CVs and bios to assign an individual's primary institutional affiliation in a given year.

In addition, some faculty have multiple departments within a university. In some cases, those multiple departments are part of our larger disciplinary categories (e.g. general economics and agriculture economics are part of the field "economics" in our analysis). If a person has multiple disciplines within our larger category, we pick one. Sometimes people have multiple departments—one that is part of our analysis (e.g. economics) and another that we do not track (e.g. public policy). We keep the primary department as economics. We took great care in assigning an individual to a department, in some cases hand-checking individuals. AcadA has created the Scholary Research Index (SRI). This is a normalized index of faculty research output including publications, citations, federal research funding, books, book chapters, conference proceeding and honors by discipline with the weights on these outcomes determined by their field. For example, a person with two departmental affiliations such as economics and agriculture economics would have two SRI measures. In our analysis we use the maximum of a person's SRI measure.[2]

Although AcadA has excellent measures of a faculty member's research productivity, they do not have detailed demographic information. We observe gender and PhD degree year. AcadA also has information the university including whether it is public, public land grant, a

[2] AcadA has publications for individuals from 2004 – 2022 as well as total citations to those publications as of 2022. AcadA also collections information on federal research grants from 2004-2022. We do not use these measures because the SRI index which is a weighted average of publications, grants and citations fits the data better than including these separate measures.

member of the AAU and the Carnegie ranking of the institution. Since we focus on the top 272 funded institutions, the majority of universities are classified as Research Very High.

Our focus is on the determinants of faculty mobility, but not all moves are created equal. We first consider moves between the 272 AcadA institutions (moves). Next, a faculty member can exit the AcadA data. If the person exits AcadA prior to 30 years past the PhD, this person is measured as an exit (exits). If the person exits AcadA with 30 years or more past the PhD and is ranked as an associate or full professor, that person is coded as retired (retirement). All faculty mobility is coded as moved, exited or retired in the next year. We do this to retain the observable characteristics of those who ultimately leave the sample.

Figure 1 shows the dynamics of moves, exits and retirements. Combining moves and exits is a proxy for job-to-job flows. Mobility falls and then flattens out through 2015 and then begins to increase. It dips during the COVID-19 pandemic and spikes in 2022. When moves and exits are separated, moves are roughly constant across the entire time period, dipping during COVID and rebounding in the last year. Exits are driving all of the dynamics in mobility. Retirements peak in 2012 and 2013 (coinciding with the aftermath of the Great Recession) and then bounce around for the remainder of the time period.

Figure 2 shows mobility by field in the last year of the sample, when mobility peaked. In the fields of chemical engineering, computer science, and electrical engineering, job mobility measured by moves and exits combined were about double the share of retirements. Retirements exceeded job mobility in biomedicine, chemistry and psychology. Thus, there is some heterogeneity in job mobility across fields.

In Figure 3, we compare how mobility among tenure stream faculty at research-intensive universities compares with measures of all tenure stream faculty at four-year institutions and all

other employed doctorates in the same academic discipline. We used the 2021 wave of the Survey of Doctorate Recipients which asked respondents to report whether they had changed employers in the previous two years. The results are striking: job mobility at research-intensive universities measured by AcadA in 2021 and 2021 was significantly lower than among tenure stream faculty at four-year institutions in the SDR. Job mobility among non-academics was the highest, and about four times higher than at AcadA institutions. Compared to individuals with doctorates in the same field who are not employed in tenure stream jobs at four-year universities, faculty at research-intensive universities rarely move.

Table 2 shows the characteristics of the estimation sample which is a pooled cross section of regular faculty with academic ranks of assistant, associate, or full professors. People can appear multiple times in the sample. The first column shows the mean characteristics and the counts of people who moved or exited, followed by separate columns for moved, exited, retirement and non-movers. Close to 27% of those who moved or exited are female, and 38% are assistant professors. Associate professors are less likely to move or exit than full professors, but this may be the result of mismeasured retirements. Most moves or exits were from public universities (71%) and 41% were from AAU institutions. The SRI productivity measure was somewhat positive 11% of a standard deviation. The highest share of moves or exits were in economics (3.3%) followed by biomedicine (3.0%). Electrical engineers were the least likely to move or exit (2.33%).

In total 2.8% of faculty move or exit in the 13 years of our data, and only 1.5% move between AcaA institutions. We do not know the destination of those who exit (1.3%) but given that they have less than 30 years of work experience, they most likely moved to another job. A larger number of faculty retire (3%). Movements across AcaA institutions are rare and

concentrated among assistant and full professors. In contrast, the majority of exits (46%) are assistant professors, and their SRI index is negative. The SRI index is also negative for retirements. Also, the SRI productivity index is the highest for those who move across AcaA institutions. The second highest SRI index is for non-movers.

Given our interest in the relationship between state support for higher education and faculty mobility, we matched data from the State Higher Education Executive Officers Association (SHEEO) onto the public research institutions. We created state funding per FTE students and then looked at the change in funding by year. Figure 4 shows inflation-adjusted state support for higher education per full-time equivalent students in the US, Kansas, Iowa and Massachusetts. State support of higher education increased in real terms until the Great Recession. State support plummeted after the ARRA funding to states ended in 2009 through 2012. States such as Massachusetts returned state support for higher education to previous levels whereas states such as Iowa and Kansas permanently reduced funding. Figure 5 shows the average change in real state funding per FTE students. Between 2009-2012, the Great Recession and its aftermath, state funding per FTE dropped significantly. State funding rebounded somewhat between 2013 and 2015 and then trended downwards, rebounding again in 2019, falling in 2020 and back up again in 2022. In Figure 6, we show the total change in state support per FTE between 2009-2018. In all but a handful, states are providing less financial support per student.

We take three approaches to estimating the determinants of mobility. Given the differences in the SRI index as well as the shares who move, exit, or retire, we estimate each mobility outcome separately. First, we estimate a pooled OLS model:

$$Y_{it} = \alpha + \beta Female_i + \gamma Public_{it} + \psi SRIProductivity_{it} + \phi AAU_{it} + \theta X_{it} + \delta_t + e_{it}$$

Where *Y* is a dummy variable for whether or not a person moved (exited, retired), *Public* is whether a person is employed at a public university, *AAU* measures whether the person is employed at an AAU institution, *SRIProductivity* is the field -normalized productivity index, *X* includes academic rank, field, and a quadratic in years since PhD, and $\delta$ are year dummies. We start by estimating this pooled linear probability model to determine those characteristics associated with mobility.

Second, we are interested in whether the change in state funding at public universities is associated with moves, exits and retirements. In this case we estimate a two-way fixed effects model, limiting our sample to those who were first observed working at a public university:

$$\Delta Y_{it} = \phi \Delta \ln(StateFund_{it}) + \psi \Delta SRIProductivity_{it} + \theta \Delta X_{it} + \delta_t + e_{it}$$

We drop the time-invariant variables and include *StateFund,* the log of state funding per full-time equivalent student at public universities. The goal of this set of estimates is to see whether faculty at public universities move, exit or retire in response to changes in state funding.

***Identification***

Typically, state allocations to higher education are made across all institutions. Thus, when states cut higher education budgets some universities may be more reliant on state appropriations than others. We follow Demming & Walters (2017) in using these differences in reliance on state funding across institutions to estimate the impact of funding changes.

We create a budget shock instrumental variable (IV) that multiplies the ratio of state appropriations relative to the college population by the ratio of appropriations to revenue in the year 2000. The instrument is given by:

$$Z_{it} = \left(\frac{Appropriation_{i,2000}}{Revenue_{i,2000}}\right) \times \left(\frac{StateAppropriation_{si,t}}{Population_{si,t}}\right)$$

Using data from SEEHO, we found state appropriations and revenue in the base year of 2000 to form the first ratio. The second ratio takes state appropriations for the given year and then divides it by the college-age population in state s and year t. The first term calculates the university's dependence on state funding in the base year. By scaling appropriations by revenue share, this adjusts for potential variation to state budget shocks that may be driven by institutional responses. Some universities may be less dependent on state appropriations over time because of their ability to attract students from out-of-state or to support the university through other forms of revenue generation. The second factor adjusts current year appropriations by college-age population to address the concern that variation in funding across state and year may be driven by unobserved factors. For example, rival institutions within a state may receive more funding depending on their number of alumni in the state legislature. Alternatively, legislatures may allocate additional funds to colleges that address certain state educational priorities.[3] Next, we examine the relationship between these state budget shocks on faculty mobility.

[3] For example, in 2012 the Kansas legislature invested $10.5 million in the schools of engineering at the University of Kansas, Kansas State University and Wichita State University to increase engineering graduates for the state of Kansas. https://www.kansasregents.gov/workforce_development/university_engineering_initiative#:~:text=Each%20university%20is%20matching%20this,education%20of%20engineers%20in%20Kansas.

## Results

### *Determinants of Mobility*

Table 3 shows the pooled OLS estimates of the determinants of moves across AcaA institutions, exits or retirements for all faculty and faculty who were first observed as tenured. Female faculty are less likely to move and retire. Assistant professors are the most likely to move and exit. Moves and exits are less likely in public and AAU institutions, whereas retirements are more likely at these places. The impact of research productivity varies by type of move. Moving among AcadA institutions is positively selected on productivity. Exiting and retirement are negatively selected.

In order to understand the effect of years of experience on mobility, we interacted years since PhD with AAU status in the pooled OLS model and plotted the predicted effect of years since PhD on moves and exits for those first observed in the sample as assistant professors and moves or exits and retirement for those first observed in the tenured ranks of associate and full professor. Figure 7A shows that assistant professor mobility trends down with years of experience. However, faculty and non-AAU institutions are significantly more likely to move to another AcadA institution than those at AAU institutions. The second panel shows that for both AAU and not-AAU institutions, the likelihood of exiting increases by years since AcadA stabilizing around 2% after expected tenure (8 years past PhD). Only 1.2% of faculty first observed in tenured ranks exit the sample. As a result, we combine exits with moves in the first panel of 7B. As with assistant professors, job changes measures by moves and exits are higher at non-AAU institutions. Job mobility is lower and flatter at AAU institutions starting at about 2% at six years since the PhD and gradually declining. At non-AAU institutions, mobility is over 4% but by year 30 converges to the same level as AAU institutions at just under 2%. Next, we

examined the effect of time since PhD on the likelihood of retirement from 20 to 40 years past PhD. There is a monotonic increase in the likelihood of retirement. At first, faculty at non-AAU institutions are more likely to retire, but after 30 years post-PhD the retirement rates are similar.

In Table 4, we limited our analysis to individuals who were first observed at public research institutions and included the log of state funding per FTE student as a covariate. The majority of institutions in our sample (213 or 78%) are public universities. For all mobility categories, a one percent increase in state funding increases the likelihood of moving but the overall effect is very small. Scholarly productivity has the same sign and magnitude for moves, exits and retirements.

We next consider the impact of changes in state funding on the likelihood of mobility using fixed effects models. Increases in state funding are associated with moves, exits and retirements for all faculty and moves and retirements for tenured faculty. The magnitude of the coefficients are larger for tenured faculty. Taken together, our results show that faculty productivity and state funding are associated with the low rates of job mobility observed in the data. In the next section, we implement the IV strategy to identify the causal effect of state funding on mobility.

***Causal Effect of State Funding and Mobility***

Table 6 reports the instrumental variables estimates of the effect of the state spending on the likelihood of job mobility. The IV estimates switch signs and become significant for moves and retirements. A one percent increase in state funding per FTE results in a 3.9% reduction in all faculty moving and at 1.4% reduction in retirement. When the sample is limited to those faculty who are first observed in tenured ranks, the magnitude of the coefficient increases to a

4.1% reduction in moves and a 2.5% reduction in retirements. The first stage F-statistics indicate that the budget shock variable is highly significant. Compared with the fixed effects estimates in Table 5, the estimated effect of the productivity measure is mostly the same. Since the productivity index is a z-score, it can be interpreted as a one standard deviation increase in the productivity index increases the likelihood of all faculty moving by .8% and tenured faculty moving by .4% while decreasing the likelihood of tenured faculty retiring by 1.7%.

Table 7 separates out the effect of state funding on job mobility by field for all faculty in the sample. In this analysis we combine moves and exits into a single category and also examine retirements. Increases in log state funding are associated with an 8% percent decrease in biomedical faculty and a 12.7% decrease in economics faculty mobility. In contrast, increases in state funding are associated with increased moves or exits in electrical engineering. There is no significant effect of state funding on the mobility of faculty in chemistry, chemical engineering computer science and psychology. In terms of retirements, increases in state funding led to a 2.7% reduction in retirements in economics and a 3% reduction in psychology.

We performed the same analysis for the sample of faculty who were first observed in tenured ranks. Biomedical and economics faculty are significantly less likely to move, exit, or retire in response to state funding increases.

**Discussion and Conclusions**

This paper has examined the determinants of faculty mobility at research intensive-universities. We began by noting that all moves are not created equal. As a result, we separated moves within the AcaA universe of universities, exits from the AcaA data, and retirements (proxied by exits after 30 years since PhD). Compared to the overall labor market and to

employed doctorates, moves and exits (job-to-job changes) in our sample are much lower than in the rest of the economy. In particular, doctorates employed in non-academic jobs are four times more likely to change employers than the faculty at research-intensive universities. Our analysis shows that the most productive faculty are the most likely to move across AcaA universities, especially those who are assistant professors. In contrast, those who exit have lower productivity. Retirements show the same negative selection: faculty with higher rates of productivity are less likely to retire.

We examined the dynamics of moves, exits and retirement tenure status. Untenured faculty move at a decreasing rate with years of experience but are more likely to exit. Tenured faculty (at the associate and full professor ranks) have diminishing mobility in years since PhD. We separated universities by AAU membership. In our regressions, employment at an AAU institution was associated with lower mobility. Since AAU is a class of highly funded, elite institutions, this suggests that as prestige increases the need relocate decreases. Given the overall low rates of mobility, especially post-tenure, it appears that tenured faculty have *gold-plated handcuffs*. The more seniority these faculty have, the less likely they are to move or exit. Only the lower-productivity faculty opt to retire.

We next examined whether state funding per students were associated with moves, exits and retirements. In the pooled OLS and fixed effects regressions, there was a positive relationship between state funding and moves, exits and retirements. However, reliance on state funding can differ by a number of unobserved characteristics. As a result, we used a budget shock instrument to identify the causal effect of funding changes on faculty mobility. Accounting for the endogeneity of state funding, switches the estimated sign. As the log of state

funding increases, moves and retirements decrease. We found that the fields of economics, biomedicine and electrical engineering were the most responsive to state budget cuts.

Our results have implications for faculty, universities, and science policy scholars. Tenured faculty mobility is low. If a faculty member wants to improve their job prospects, maximizing research is the best strategy. Universities should be aware that senior faculty exhibit positive survivor bias. Lower research productivity is associated with retirements, and those senior faculty who remain appear to be productive. Science policy scholars have noted that faculty moves are associated with increased research productivity (Halevi, Moed and Bar-Illan 2016 and Aknes et al 2013, Ham, Quistorff & Weinberg 2025). However, these moves among research-intensive universities are exceedingly rare. As a result, research that relies on moves to identify causal effects on research productivity and other outcomes needs to be treated with caution.

These preliminary results suggest further opportunities for analysis. For now, we have found that more productive faculty are likely to move using the scholarly research index. Future work will examine whether publications, citations, grants and awards have a differential impact on faculty mobility. Subsequent analysis will look at the quality of institutions that attract these movers. Are these highly productive faculty moving to better (or worse) departments? We will also consider what happens to the research output of departments when faculty move.

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**Table 1: Higher Education Appropriations**

| State | Percent Change in Public Higher Education Funding 2011-2016 per FTE Students[a] | Percent Change in Public Higher Education Funding since Great Recession[a] | Tax Cut[b] | Flagship University | Percent Change in HERDS Funding 2011-16[c] | Percent Change in Real HERDS Funding 2011-16[c] |
|---|---|---|---|---|---|---|
| Oklahoma | -16.1% | -32.9% | 2008 | University of Oklahoma, Norman | 4.3% | -3.4% |
| Louisiana | -13.8% | -46.4% | 2009 | Louisiana State University Baton Rouge | 1.4% | -6.0% |
| West Virginia | -12.4% | -31.5% | | University of West Virginia | 3.6% | -4.0% |
| Arkansas | -6.7% | -13.3% | | University of Arkansas | 20.8% | 11.9% |
| Vermont | -61.0% | -19.6% | 2010 | University of Vermont | -12.4% | -18.9% |
| Arizona | -5.8% | -41.4% | 2008 | University of Arizona | -1.0% | -8.3% |
| Wisconsin | -5.2% | -23.4% | | University of Wisconsin, Madison | 4.1% | -3.5% |
| New Jersey | -4.9% | -24.7% | | Rutgers University | 45.8% | 35.0% |
| Kentucky | -3.7% | -25.3% | | University of Kentucky | -6.2% | -13.2% |
| Missouri | -1.3% | -26.7% | | University of Missouri, Columbia | 7.5% | -0.4% |
| Alaska | -1.2% | -4.6% | | University of Alaska Fairbanks | -12.9% | -19.3% |
| Delaware | -1.0% | -25.3% | | University of Delaware | 3.9% | -3.8% |
| Alabama | -0.6% | -36.5% | | University of Alabama | 16.6% | 8.0% |
| Nevada | 0.6% | -31.2% | | University of Nevada | 6.4% | -1.5% |
| Kansas | 0.8% | -20.5% | 2013 | University of Kansas | 8.4% | 0.4% |
| Pennsylvania | 2.5% | -35.4% | | Pennsylvania State University | 3.9% | -3.8% |

[a] Source: SHEEO (2018); [b] Source: Tax cuts: Book of the States (various years). [c] Source: NSF Higher Education Research & Development Survey, author's calculations.

**Table 2: Characteristics of Faculty by Mobility Type, Academic Analytics 2009 - 2022**

| Variable | Moved or Exited | Moved in AcaA | Exited | Retirement | Non-Movers |
|---|---|---|---|---|---|
| Female | 0.265 | 0.252 | 0.280 | 0.165 | 0.232 |
| | (0.441) | (0.434) | (0.449) | (0.372) | (0.422) |
| Female missing | 0.143 | 0.132 | 0.156 | 0.066 | 0.101 |
| | (0.350) | (0.339) | (0.363) | (0.247) | (0.302) |
| Max SRI individual | 0.110 | 0.463 | -0.304 | -0.316 | 0.225 |
| | (0.995) | (0.929) | (0.908) | (1.038) | (0.977) |
| Full Professor | 0.415 | 0.372 | 0.463 | 0.011 | 0.233 |
| | (0.493) | (0.484) | (0.499) | (0.105) | (0.423) |
| Associate Professor | 0.318 | 0.230 | 0.421 | 0.117 | 0.252 |
| | (0.466) | (0.421) | (0.494) | (0.321) | (0.434) |
| Assistant Professor | 0.378 | 0.501 | 0.190 | 0.979 | 0.678 |
| | (0.485) | (0.500) | (0.392) | (0.145) | (0.467) |
| Public University | 0.707 | 0.720 | 0.692 | 0.749 | 0.721 |
| | (0.455) | (0.449) | (0.462) | (0.433) | (0.449) |
| AAU Member | 0.451 | 0.463 | 0.435 | 0.521 | 0.533 |
| | 0.265 | 0.252 | 0.280 | 0.165 | 0.232 |
| **Counts by Field** | | | | | |
| Biomedicine | 10,102 | 4,064 | 5,517 | 11,617 | 317,008 |
| | 2.98% | 1.36% | 1.63% | 3.43% | 93.58% |
| Chemical Engineering | 647 | 471 | 177 | 591 | 24,006 |
| | 2.56% | 1.87% | 0.70% | 2.34% | 95.09% |
| Chemistry | 940 | 605 | 335 | 1,417 | 48,851 |
| | 1.84% | 1.18% | 0.65% | 2.77% | 95.40% |
| Computer Science | 2,875 | 1,086 | 1,070 | 2,319 | 99,613 |
| | 2.74% | 1.72% | 1.02% | 2.21% | 95.04% |
| Economics | 1,849 | 1,101 | 749 | 1,650 | 52,025 |
| | 3.33% | 1.98% | 1.35% | 2.97% | 93.69% |
| Electrical Engineering | 1,331 | 907 | 424 | 1,345 | 54,469 |
| | 2.33% | 1.59% | 0.74% | 2.35% | 95.32% |
| Psychology | 1,874 | 1,103 | 774 | 2,031 | 65,883 |
| | 2.69% | 1.58% | 1.11% | 2.91% | 94.40% |
| Observations | 19,618 | 10,597 | 9,046 | 20,970 | 661,805 |
| | 2.79% | 1.51% | 1.29% | 2.99% | 94.22% |

Source: Academic Analytics 2009—2022.

**Table 3: OLS Estimates of Faculty Mobility at Research-Intensive Universities**

| | All Faculty | | | Tenured Faculty | | |
|---|---|---|---|---|---|---|
| VARIABLES | Moved | Exited | Retired | Moved | Exited | Retired |
| Female | 0.002*** | -0.000 | -0.002** | 0.001* | 0.000 | -0.001 |
| | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.002) |
| SRI Productivity | 0.005*** | -0.003*** | -0.015*** | 0.004*** | -0.002*** | -0.023*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) |
| AAU Member | -0.006*** | -0.001*** | 0.002** | -0.004*** | -0.001** | 0.002 |
| | (0.000) | (0.000) | (0.001) | (0.000) | (0.001) | (0.001) |
| Public University | -0.001* | -0.003*** | 0.007*** | -0.016*** | -0.004* | 0.007** |
| | (0.000) | (0.000) | (0.001) | (0.004) | (0.002) | (0.003) |
| Years Since PhD | -0.001*** | 0.002*** | -0.003*** | -0.001*** | 0.000** | -0.004*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Years Since PhD--Squared | 0.000*** | -0.000*** | 0.001*** | 0.000*** | -0.000** | 0.001*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Associate Professor | -0.000 | 0.020*** | -0.015*** | -0.001 | 0.017*** | -0.023*** |
| | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.002) |
| Assistant Professor | 0.006*** | 0.031*** | -0.025*** | 0.009 | 0.023*** | -0.026*** |
| | (0.001) | (0.001) | (0.001) | (0.006) | (0.005) | (0.004) |
| Observations | 696,208 | 696,208 | 696,208 | 273,203 | 273,203 | 273,203 |
| R-squared | 0.007 | 0.014 | 0.068 | 0.006 | 0.012 | 0.064 |

Notes: All regressions include year and field dummies. Standard errors clustered on individual. *** p<.01, ** p<.05, * p<.10.

**Table 4: OLS Estimates of Faculty Mobility at Public Research-Intensive Universities**

| | All Faculty | | | Tenured Faculty | | |
|---|---|---|---|---|---|---|
| VARIABLES | Moved | Exited | Retired | Moved | Exited | Retired |
| State Funding per FTE | 0.000** | 0.002*** | 0.001*** | 0.001** | 0.002*** | 0.003*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) |
| Female | 0.002*** | -0.000 | -0.001 | 0.001 | 0.000 | -0.000 |
| | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.002) |
| SRI Productivity | 0.006*** | -0.004*** | -0.017*** | 0.004*** | -0.003*** | -0.025*** |
| | (0.000) | (0.000) | (0.001) | (0.000) | (0.000) | (0.001) |
| AAU Member | -0.002*** | -0.002*** | 0.000 | -0.001* | -0.001** | 0.001 |
| | (0.000) | (0.001) | (0.001) | (0.000) | (0.001) | (0.002) |
| Years Since PhD | -0.001*** | 0.002*** | -0.004*** | -0.001*** | 0.000** | -0.005*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Years Since PhD--Squared | 0.000*** | -0.000*** | 0.001*** | 0.000*** | -0.000** | 0.002*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Associate Professor | -0.000 | 0.020*** | -0.016*** | -0.001 | 0.017*** | -0.025*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.002) |
| Assistant Professor | 0.006*** | 0.032*** | -0.029*** | 0.012* | 0.023*** | -0.028*** |
| | (0.001) | (0.001) | (0.001) | (0.007) | (0.006) | (0.004) |
| Observations | 438,979 | 438,979 | 438,979 | 246,506 | 246,506 | 246,506 |
| R-squared | 0.006 | 0.013 | 0.077 | 0.004 | 0.012 | 0.066 |

Notes: All regressions include year and field dummies. Standard errors clustered on individual. *** p<.01, ** p<.05, * p<.10.

**Table 5: Fixed Effects Estimates of Impact of State Funding on Moves, Exits and Retirements**

| | All Faculty | | | Tenured Faculty | | |
|---|---|---|---|---|---|---|
| VARIABLES | Moved | Exited | Retired | Moved | Exited | Retired |
| State Funding per FTE | 0.007** | 0.004*** | 0.004*** | 0.013*** | 0.001 | 0.009*** |
| | (0.003) | (0.001) | (0.001) | (0.004) | (0.001) | (0.003) |
| SRI Productivity | 0.008*** | -0.002*** | -0.007*** | 0.004*** | -0.001*** | -0.018*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.000) | (0.001) |
| R-squared | 0.003 | 0.019 | 0.077 | 0.003 | 0.007 | 0.084 |
| Observations | 438,979 | 438,979 | 438,979 | 246,506 | 246,506 | 246,506 |
| Number of People | 49,776 | 49,776 | 49,776 | 24,935 | 24,935 | 24,935 |

Notes: All regressions include year and field dummies, academic rank and a quadratic in years since PhD. *** p<.01, ** p<.05, * p<.10.

**Table 6: Instrumental Variable Fixed Effects Estimates of Impact of State Funding on Moves, Exits and Retirements**

| | All Faculty | | | Tenured Faculty | | |
|---|---|---|---|---|---|---|
| VARIABLES | Moved | Exited | Retired | Moved | Exited | Retired |
| State Funding per FTE | -0.039*** | -0.005 | -0.014*** | -0.041** | -0.002 | -0.025*** |
| | (0.012) | (0.003) | (0.005) | (0.017) | (0.003) | (0.010) |
| SRI Productivity | 0.008*** | -0.003*** | -0.007*** | 0.004*** | -0.002*** | -0.017*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| First Stage F-Statistic | 1125.9 | 1125.9 | 1125.9 | 847.9 | 847.9 | 847.9 |
| R-squared | 0.0003 | 0.004 | 0.013 | 0.0001 | 0.002 | 0.040 |
| Observations | 330,635 | 330,635 | 330,635 | 196,330 | 196,330 | 196,330 |
| Number of People | 44,441 | 44,441 | 44,441 | 23,688 | 23,688 | 23,688 |

Notes: All regressions include year and field dummies, academic rank and a quadratic in years since PhD. *** p<.01, ** p<.05, * p<.10.

**Table 7: Instrumental Variables Fixed Effects Estimates of Impact of State Funding on Moves, Exits and Retirements For Faculty at Research-Intensive Universities**

| VARIABLES | (1) Biomedicine | (2) Chemistry | (3) Chemical Engineering | (4) Computer Science | (5) Economics | (6) Electrical Engineering | (7) Psychology |
|---|---|---|---|---|---|---|---|
| **Moves or Exits** | | | | | | | |
| State Funding per FTE | -0.080*** | 0.042 | 0.031 | 0.004 | -0.127*** | 0.078** | -0.057 |
| | (0.023) | (0.028) | (0.060) | (0.023) | (0.040) | (0.033) | (0.038) |
| SRI Productivity | 0.004*** | 0.006* | 0.012** | 0.004** | 0.016*** | 0.005* | 0.002 |
| | (0.001) | (0.003) | (0.005) | (0.002) | (0.003) | (0.003) | (0.003) |
| R-squared | 0.001 | 0.001 | 0.002 | 0.002 | 0.001 | 0.0002 | 0.003 |
| **Retirements** | | | | | | | |
| State Funding per FTE | -0.014* | -0.005 | -0.017 | -0.010 | -0.027** | -0.010 | -0.030** |
| | (0.008) | (0.015) | (0.026) | (0.009) | (0.013) | (0.014) | (0.012) |
| SRI Productivity | -0.007*** | -0.003 | -0.004 | -0.005*** | -0.005** | -0.006** | -0.016*** |
| | (0.001) | (0.003) | (0.004) | (0.002) | (0.002) | (0.002) | (0.002) |
| R-squared | 0.039 | 0.021 | 0.045 | 0.0001 | 0.016 | 0.0002 | 0.022 |
| First Stage F Statistic | 661.7 | 246.0 | 113.6 | 369.1 | 174.2 | 242.0 | 329.8 |
| Observations | 151,626 | 25,960 | 12,051 | 50,715 | 25,306 | 28,042 | 36,935 |
| Number of People | 23,847 | 3,720 | 1,852 | 7,666 | 3,811 | 4,069 | 5,585 |

Notes: All regressions include year and field dummies, academic rank and a quadratic in years since PhD. *** p<.01, ** p<.05, * p<.10.

**Table 8: Instrumental Variables Fixed Effects Estimates of Impact of State Funding on Moves, Exits and Retirements For Tenured Faculty at Research-Intensive Universities**

| VARIABLES | (1) Biomedicine | (2) Chemistry | (3) Chemical Engineering | (4) Computer Science | (5) Economics | (6) Electrical Engineering | (7) Psychology |
|---|---|---|---|---|---|---|---|
| **Moves or Exits** | | | | | | | |
| State Funding per FTE | -0.074*** | 0.034 | 0.041 | 0.026 | -0.096** | 0.042 | -0.037 |
| | (0.029) | (0.039) | (0.080) | (0.027) | (0.046) | (0.037) | (0.055) |
| SRI Productivity | 0.002 | 0.000 | 0.007 | -0.000 | 0.005* | 0.002 | 0.002 |
| | (0.001) | (0.003) | (0.005) | (0.002) | (0.003) | (0.002) | (0.003) |
| R-squared | 0.0000 | 0.0001 | 0.0001 | 0.002 | 0.001 | 0.0000 | 0.003 |
| **Retirements** | | | | | | | |
| State Funding per FTE | -0.026* | 0.011 | -0.040 | -0.020 | -0.071*** | -0.024 | -0.030 |
| | (0.016) | (0.028) | (0.039) | (0.018) | (0.024) | (0.026) | (0.023) |
| SRI Productivity | -0.017*** | -0.015*** | -0.012* | -0.014*** | -0.023*** | -0.014*** | -0.029*** |
| | (0.002) | (0.005) | (0.006) | (0.003) | (0.004) | (0.004) | (0.004) |
| R-squared | 0.049 | 0.042 | 0.050 | 0.019 | 0.018 | 0.014 | 0.057 |
| First Stage F Statistic | 494.8 | 178.7 | 98.9 | 289.9 | 163.6 | 190.2 | 227.2 |
| Observations | 89,361 | 15,730 | 7,255 | 30,228 | 15,009 | 17,699 | 21,048 |
| Number of People | 12,918 | 2,059 | 983 | 3,978 | 1,995 | 2,284 | 2,877 |

Notes: All regressions include year and field dummies, academic rank and a quadratic in years since PhD. *** p<.01, ** p<.05, * p<.10.

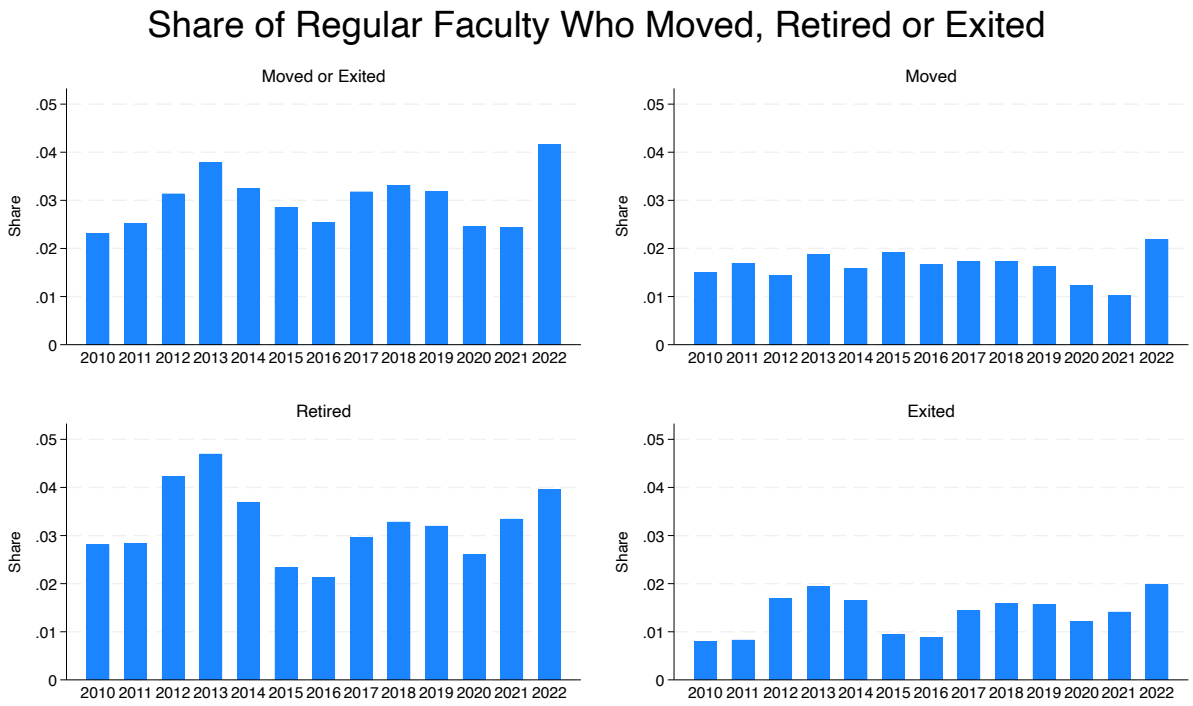



Figure 1: Share of Regular Faculty Who Moved, Retired or Exited. Source: 2009-2018 Academic Analytics.

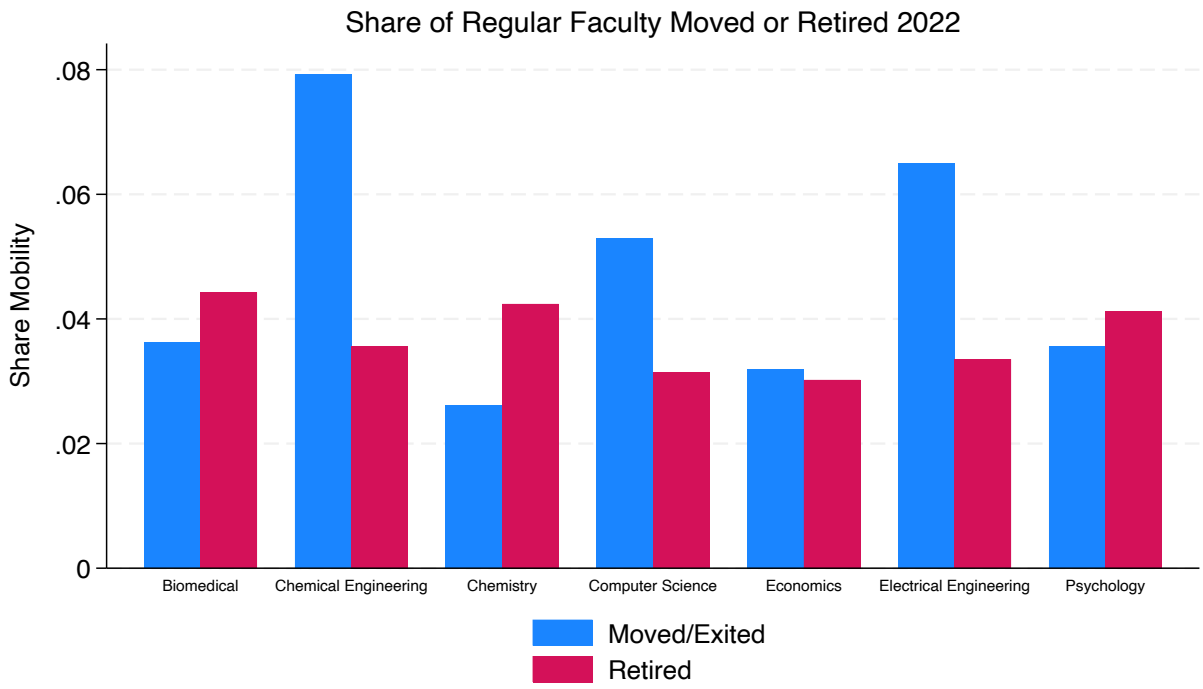



Figure 2: Share of Regular Faculty Moved or Retired. Source: 2021--2022 Academic Analytics.

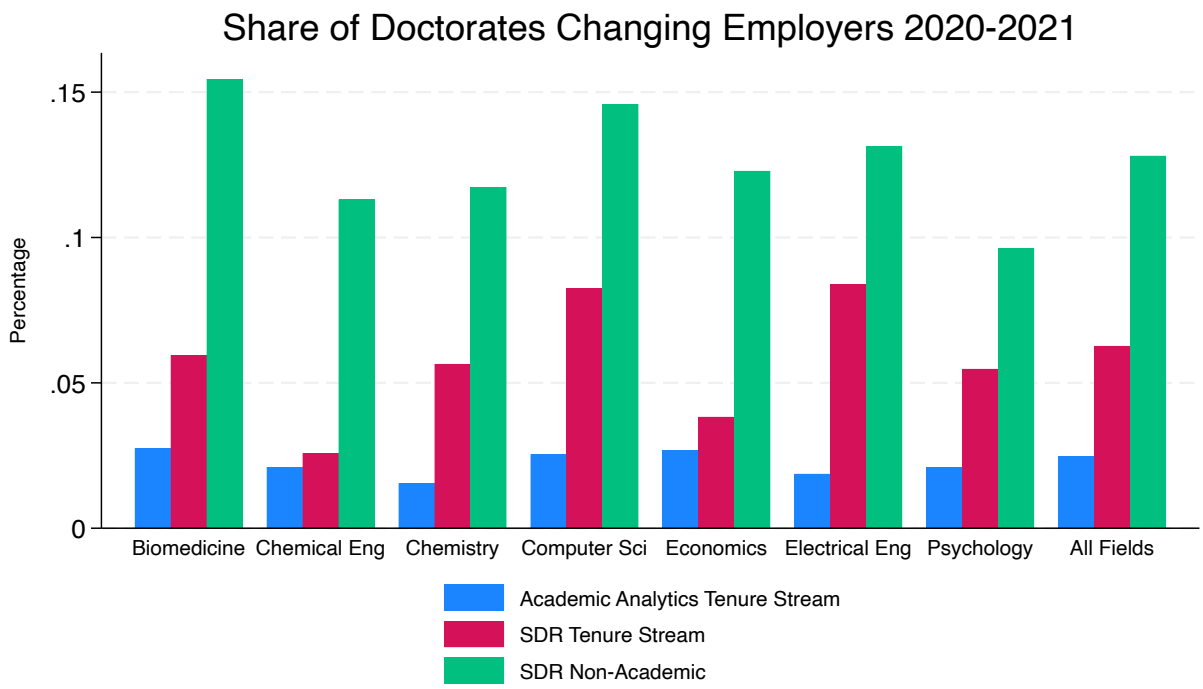



Figure 3: Share of Doctorates Changing Employers. Source: 2020--2021 Academic Analytics; 2021 Survey of Doctorate Recipients.

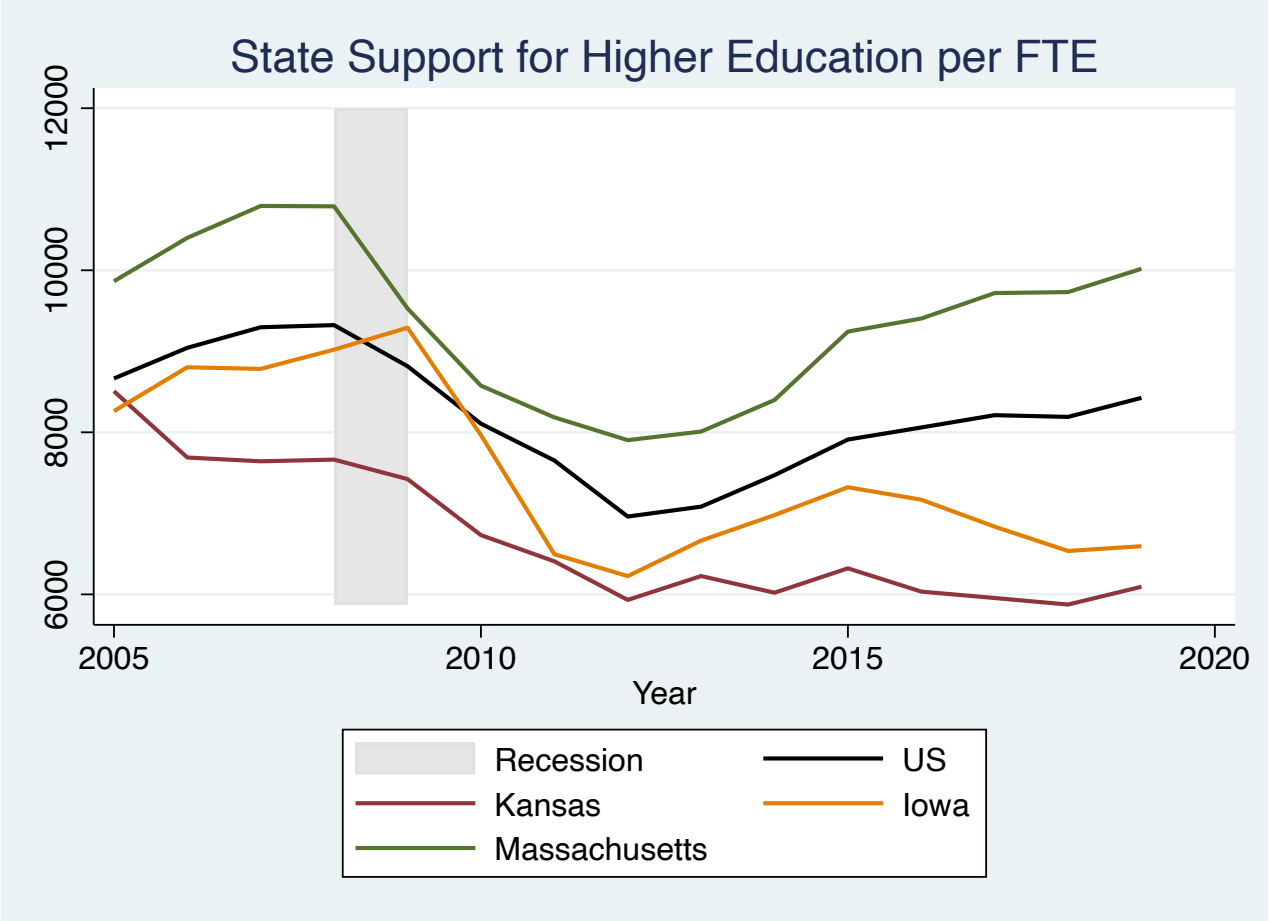



Figure 4: State Support for Higher Education per Full-time Equivalent Students 2005-2019. Source: SHEEO.

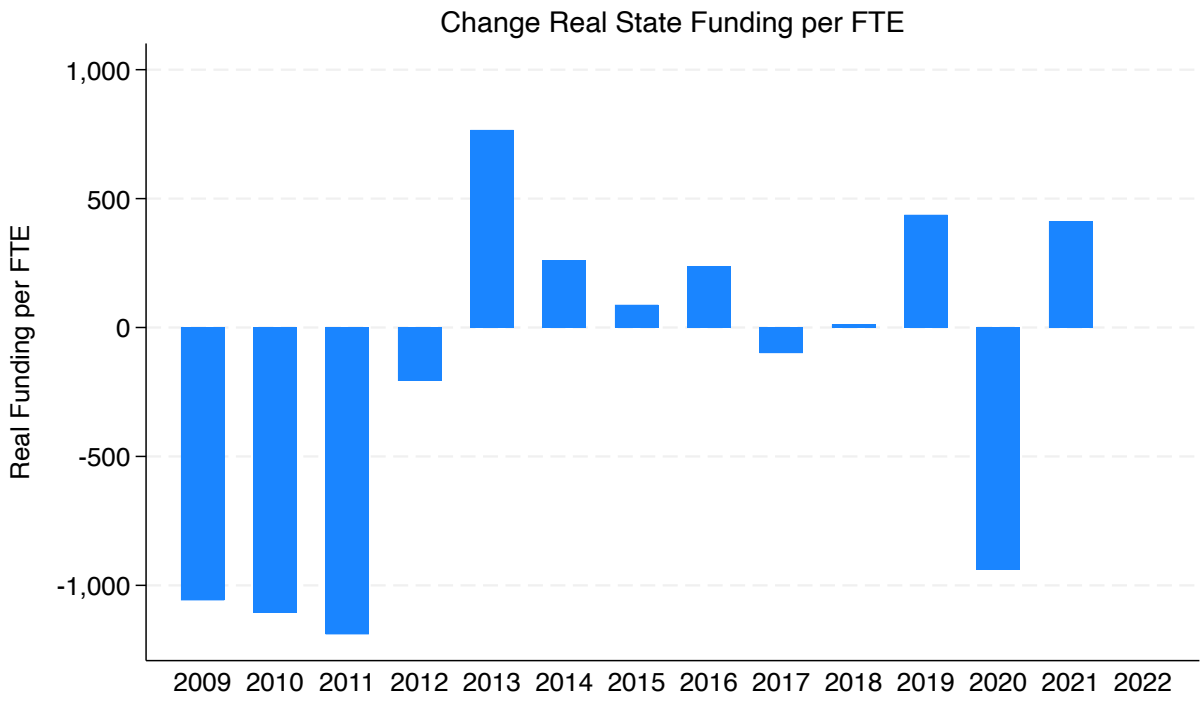



Figure 5: Change in Real State Funding per FTE 2009-2022. Source: SHEEO.

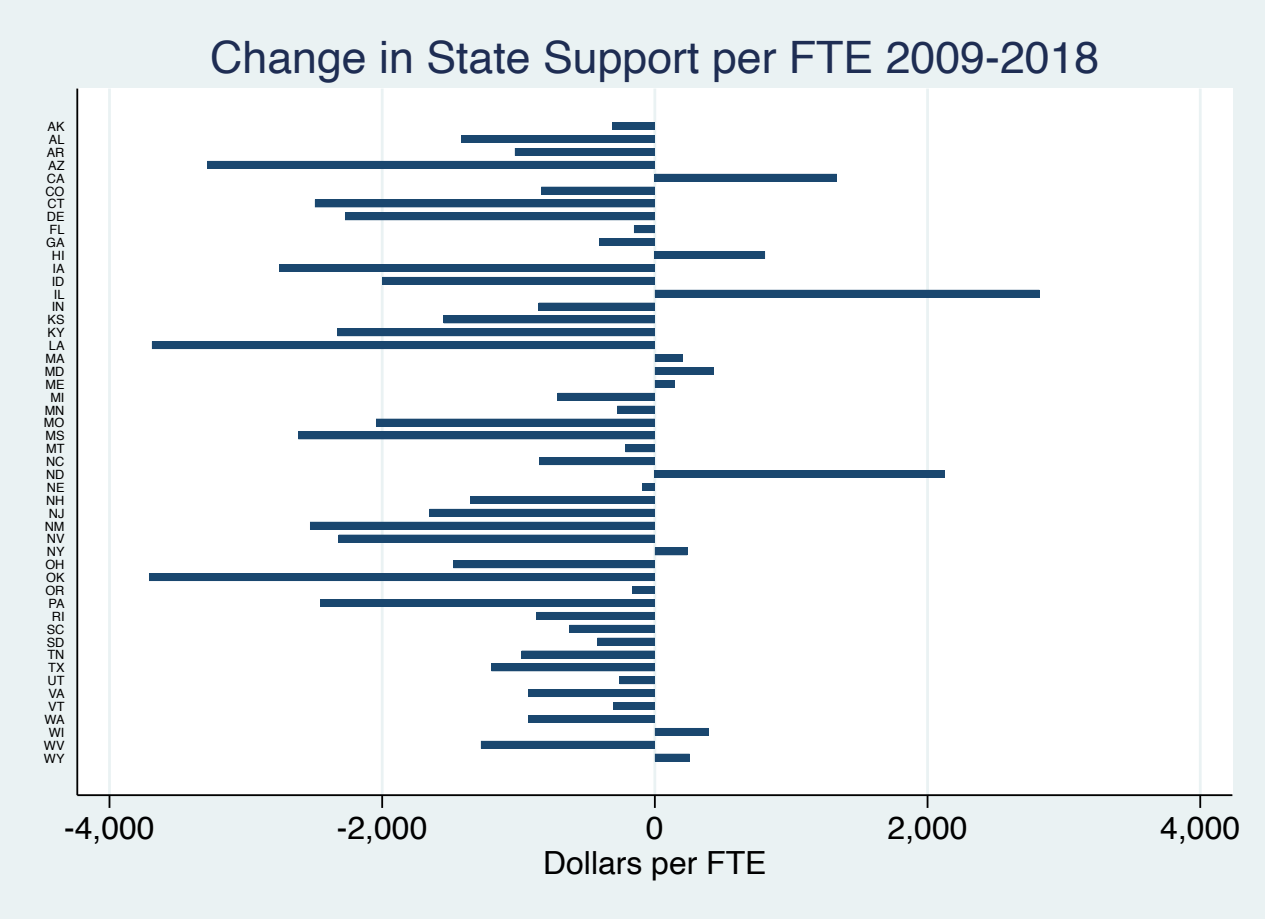



Figure 6: Change in Dollars per FTE 2009-2018, Source: SHEEO.

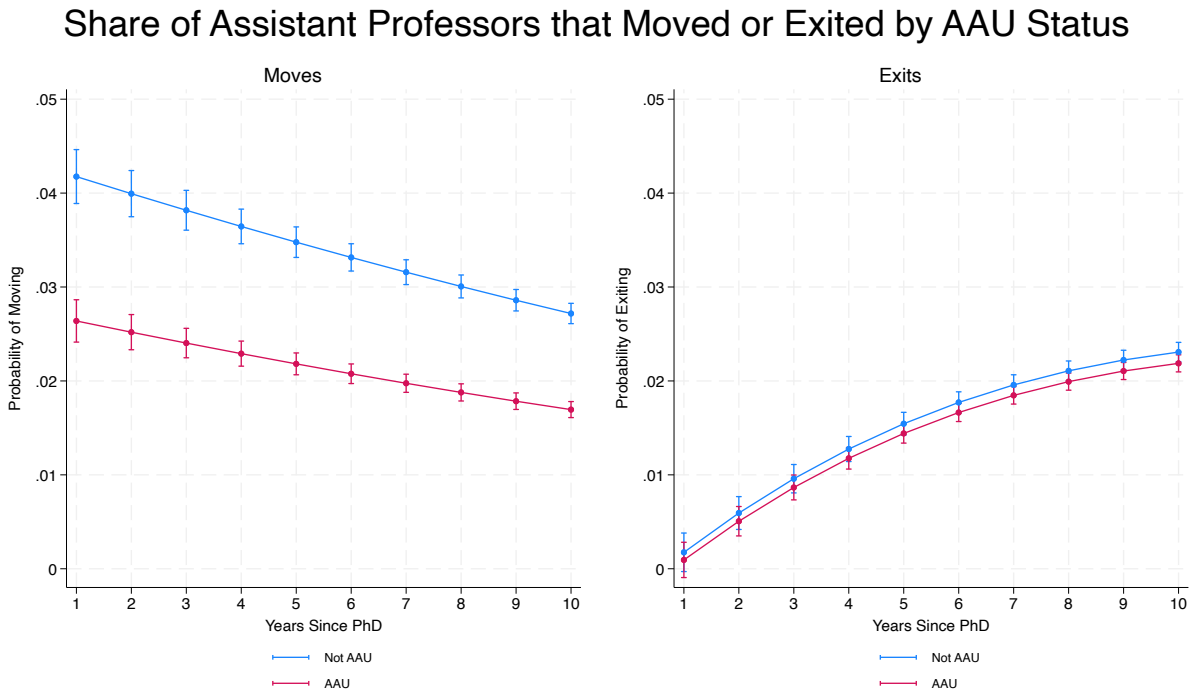



Figure 7A. Predicted Share of Assistant Professors Who Moved or Exited by Years Since PhD, Economics. Source: Academic Analytics 2009-2022.

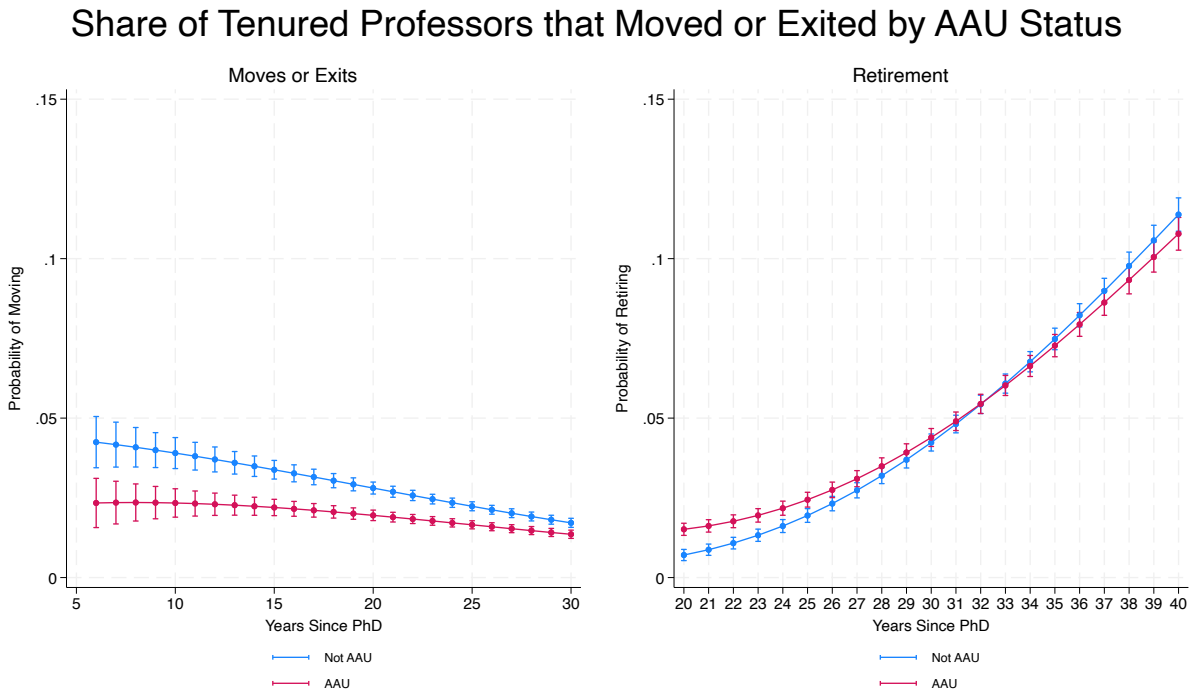



Figure 7B. Predicted Share of Tenured Faculty Who Moved or Retired by Years Since PhD. Source: Academic Analytics 2009-2018.