

# Women in Economics in South Africa

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## **Abstract**

The Women in Economics in South Africa Project aims to build an understanding of gender imbalances in the economics profession across all academic tiers in the higher education system. This research offers insights into potential barriers and biases within the higher education sector, and how they intersect with other inequalities, thus contributing evidence to inform the nation's goals of achieving gender equality and fostering inclusive economic development.

Female students represent the majority of enrolments and graduates at most qualification levels in South African public universities, but remain under-represented in PhD programs and senior academic ranks. Although the proportion of female professors has increased, the profession has not yet achieved equity, particularly among historically disadvantaged groups. Greater gender parity, particularly in academic leadership, is crucial in shaping a profession that contributes diverse perspectives and ideas to teaching, research, and discipline-wide impact. Continued progress in advancing female staff in economics will require sustained commitment, and concerted efforts to support women through the academic pipeline should therefore continue.

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## List of Abbreviations

<b>CESM</b>	Classification of Subject Educational Matter
<b>CREST</b>	The Centre for Research on Evaluation, Science and Technology
<b>CU</b>	Comprehensive University
<b>DHET</b>	Department of Higher Education and Training
<b>EMS</b>	Economic and Management Sciences
<b>FTE</b>	Full Time Equivalent
<b>HAI</b>	Historically Advantaged Institution
<b>HDI</b>	Historically Disadvantaged Institution
<b>HEMIS</b>	Higher Education Management Information System
<b>IEA</b>	International Economics Association
<b>NSC</b>	National Senior Certificate
<b>NQF</b>	National Qualifications Framework
<b>NRF</b>	National Research Foundation
<b>PG</b>	Postgraduate
<b>PSET</b>	Post-School Education and Training
<b>SA</b>	South Africa
<b>SAK</b>	South Africa Knowledgebase
<b>StatsSA</b>	Statistics South Africa
<b>STEM</b>	Science, Technology, Engineering, and Mathematics
<b>TU</b>	Traditional University
<b>UG</b>	Undergraduate
<b>UNISA</b>	University of South Africa
<b>UoT</b>	University of Technology
<b>WoS</b>	Web of Science

# 1 Introduction

Economics plays an outsized role in shaping public narratives about the role of governments, business, and public policy. Recognising this, the International Economics Association (IEA) embarked on a multi-year project<sup>1</sup> focusing on enhancing the role of women in the global economics profession. Clear gaps in the gender composition of leadership in economics, magnified by factors such as ethnicity, race, and/or geography, mean that fuller representation and greater diversity could contribute to an improved understanding of public problems and their solutions. Advancing women to leadership positions in the economics profession will require expanding the pipeline of well-qualified female economists. As a starting point, the IEA has commissioned research to assess and profile current gender gaps in the academic pipeline.

Existing discourse on the status of women in economics has centred on evidence from the United States (Lundberg, 2020) and, more recently, the United Kingdom (Gamage et al., 2020). While these studies provide valuable insights into the structural aspects of the economics discipline in these countries, South Africa has its own distinct characteristics and challenges that differentiate it from these contexts. These include, *inter alia*, inherited multi-faceted inequalities strongly linked to differential access to high skilled professions (Branson & Lam, 2022; Reddy et al., 2016), together with an economics profession that differs in size and shape.

This report offers insights into gender imbalances in the economics discipline across all academic tiers in the public higher education system in South Africa, and how gender gaps intersect with other inequalities. The growing share of women undergraduate enrolments and completions<sup>2</sup> (DHET, 2023) should not put gender equality off the policy agenda, but rather inform and shape the research agenda within the South African context. Indeed, pro-female university enrolment is juxtaposed against an improving but consistently higher share of men in senior management positions in the higher education sector (Council on Higher Education, 2023). Our intention is that the findings of this study will spark both constructive and positive reflection.

We use routinely-collected, nationally representative administrative data, allowing for an approach that systematically monitors the economics profession in South Africa. By analysing these data, we can identify and track key indicators to provide insights into the representation and progress of women in the field over time. Additionally, the use of existing administrative records offers a sustainable approach to monitoring the system without the need for primary data collection. By leveraging existing data sources, we establish a framework for ongoing monitoring, evaluation, and comparisons with other

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<sup>1</sup>See more about the project [here](#).

<sup>2</sup>Consistently above the share of women in the population (Council on Higher Education, 2023).

STEM and social science disciplines. This approach not only saves resources and time but also enables continuous tracking of progress, allowing policymakers and stakeholders to assess the impact of interventions and initiatives aimed at advancing women in economics.

In the next section, we present a review of existing evidence and research on women in academic economics in South Africa. Thereafter, we provide information on our data sources. The following three sections then present our analysis of students, staff and research outputs. Finally, we conclude with a discussion.

## 2 Review of existing evidence

Institutions of the public post-school education and training (PSET) sector in South Africa include 26 higher education institutions (universities), 50 Technical and Vocational Education and Training colleges, and nine Community Education and Training colleges. The largest share of public PSET enrolments is in the university sector (62% in 2022) and public institutions account for the bulk of university enrolments (81%) (DHET, 2024). Our report focuses on the discipline of economics, within this public university sector.

We identify five studies from South Africa (Franken, 2016; Luiz, 2004, 2009; Mouton et al., 2023; Yu et al., 2017)<sup>3</sup> that provide relevant background context on the ‘size and shape’ of academic economics. We discuss findings from these studies below and provide, alongside this, any further, relevant details about the South African higher education system and qualification structures.

Other notable studies on women in higher education in South Africa have not focused strictly on the discipline of economics. For brevity, Table A1 in Appendix A documents this literature. These studies reflect the complex ways in which gender, race, culture, and nationality intersect and influence women’s experiences at different levels of higher education in South Africa. The table highlights that the majority of this research has been qualitative, and typically relates to a single institution and/or a specific discipline.<sup>4</sup>

Although experiences may differ by discipline, this literature is helpful to the extent that a number of factors affecting women in higher education in South Africa will be relevant to academic economics too. Examples include: invisible labour such as care work (both at home and at work) and emotional labour (including expectations to be role models), the increasing burden of administrative tasks (Magoqwana et al., 2019); family responsibilities and societal norms (Managa, 2013); a reward/promotion structure that values research over other academic activities, career interruptions for childbearing (Obers, 2014); the burden of COVID-19 on research productivity (Walters et al., 2022); and institutional/organisational culture<sup>5</sup> (Mahabeer et al., 2018; Managa, 2013).

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<sup>3</sup>A sixth includes a currently unpublished manuscript by Derek Yu, which was privately shared.

<sup>4</sup>A majority consider only women’s perspectives, not those of their male counterparts.

<sup>5</sup>Many studies reflect that reform in the number of women does not necessarily mean transformation of



## 2.1 Academic economics in South Africa

The studies by Luiz (2004, 2009) and Yu et al. (2017) broadly aim to assess the state of economics departments both before and after a phase of university mergers in the tertiary education sector. For a subset of public universities with economics departments, Luiz (2004, 2009) surveys heads of department about staff profiles, student enrolments, courses and curriculum, and research activities. Only the staff profiles are disaggregated by gender in these two studies. Yu et al. (2017) examines the teaching and research activities for a similar subset of economics departments between 2005-2014, but does not provide a comparable gender dimension to the staff composition provided in Luiz (2004, 2009). Rather than surveying department heads directly, Yu et al. (2017) use a combination of methods to obtain information (differs by institution) including: faculty prospectus documents (for staff, course and curriculum information), university annual reports (for publications), or contacting staff directly for details of their research outputs.

Franken (2016) uses a combination of qualitative and quantitative approaches to provide a quantitative overview of the trends in doctoral education in the Economic and Management Sciences (EMS), of which economics is a sub-discipline. Although the study's scope is broader than the discipline of economics only, the quantitative component of Franken's study (which uses the same administrative data source as our study) dis-aggregates the analysis by both gender and race. Racial representation remains key on the transformation agenda, but out of the five studies, only Franken (2016) briefly explores this dynamic.

Mouton et al. (2023) compiled their report for the Department of Science and Innovation, to provide an indication of the current strengths and vulnerabilities of the economics field across all public universities in South Africa between 2000 and 2020. They assess 1) funding of research, 2) academic staff capacity, 3) trends in PG student enrolments and graduations, and 4) research publication performance. They include gender compositions in each section. Our report, which uses the same administrative data (see Section 3), thus expands the work of Mouton et al. (2023) by updating information to include the 2021 and 2022 academic years, extending the analysis to include undergraduate (UG) students and exploring the intersection of race and gender across different institution types.

These studies have employed different data sources, data collection approaches and definitions of the field of economics that best align with the aims of the work. Franken's (2016) study, for example, includes business and management students alongside economics students. Luiz (2004, 2009) and Yu et al. (2017) centre their studies around the activities of economics departments, whereas Mouton et al. (2023) define the discipline by Classification of Subject Educational Matter (CESM) category

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institutional culture and power.

in administrative data. This approach is the most comparable to ours, but we expand our relevant CESM categories to include, for example, agricultural economics. These choices affect the comparability of findings across studies and this should be kept in mind throughout the remainder of this report. In the following two subsections, we focus on results which are broadly comparable with ours.

### 2.1.1 Economics teaching and learning

There has been a rising demand for economics education over the past three decades at both UG (Luiz, 2004, 2009) and postgraduate (PG) (Mouton et al., 2023) levels. Luiz (2004) recognises that between the 1990s and 2002, UG enrolment in economics was largely driven by increasing student numbers at universities in general, as well as increasing demand for Bachelor of Commerce degrees.

Since 2012, enrolment in economics honours<sup>6</sup> has shifted in favour of women students (Mouton et al., 2023). However, the share of female students enrolling at master’s level only breached 50% in 2019 (Mouton et al., 2023), suggesting higher rates of conversion for male students. The share of female doctoral graduates has been erratic over the 2000-2020 period, with the share of female graduates above 50% in 2005 (almost 70%), 2011 (around 55%), 2016 (around 56%) and 2021 (around 51%). In other years, the share of female graduates fluctuates around 30%, indicating that there is overall a male advantage in doctoral graduations.

Franken (2016) provides some information on intersection of doctoral graduation and race. In the economic and management sciences, growth in the share of African (Black, Coloured, and Indian) PhD holders between 2001 and 2012 was substantial, but growth among African men far outpaced that among women for the period. Moreover, these numbers are small in absolute terms (145 graduates in 2012 in total), and economics graduates will be a subsample of these.

By 2020, the average share of female full-time equivalent (FTE) staff in economics across all public universities had grown to 45% from 30% in 2000 (Mouton et al., 2023). This reflects a 50% increase in the share of female staff over a two-decade period. Using FTE measures, Mouton et al. (2023) shows that while the representation of Black (African, Coloured, Indian, Asian) staff members increased from 27% to 57% between 2000 and 2020—a percentage increase comparable to that of women—the share remains disproportionately low given that the majority of South Africa’s population is Black. This underscores the extent to which the system remains untransformed. It remains unclear to what extent this growth has been driven, for example, by Black women, and at which rank (i.e. professor, lecturer, etc.). With regard to nationality and age: there has been an 8 percentage point decline in the share South African staff (from 87% in 2000 to 79%

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<sup>6</sup>Mouton et al. (2023) include PG diplomas in ‘honours’ qualifications.

in 2020) and an 8 percentage point decline in the share of staff under the age of 40, respectively. The increasing share of international staff may be related to the increasing share of international doctoral students observed in Mouton et al. (2023).

### 2.1.2 Research and funding

Luiz (2004) reflects that the international dictum of ‘publish or perish’ cannot be ignored in the South African context, where career advancement rests largely on the basis of research outputs. Academic staff face a trade-off between teaching and research, exacerbated by institution-imposed publishing pressures driven by subsidies tied to publication outputs (Research Outputs Policy of 2015).

To identify economics research outputs, Mouton et al. (2023) adopt an approach that defines authorship by individuals contributing to economics articles (i.e. whether their main discipline is economics or not – an output-based rather than the affiliation-based approach used in Luiz (2004, 2009) and Yu et al. (2017).) Mouton et al. (2023) find that despite a 10% growth rate in the number of female authors in economics between 2005 and 2020, this has not translated into an increased share of women authors. In fact, Mouton et al. (2023) point to a concerning 5 percentage points decrease in participation of female authors between 2000 and 2020 (from 32% to 27%).

## 3 Data and sample sizes

Student- and staff-level data from the Higher Education Management Information System (HEMIS) serve as the primary source for information on the male/female breakdown of students and staff in South Africa. The HEMIS database captures information submitted annually to the DHET by each of the country’s 26 public universities.

### 3.1 Students

The universe of students in HEMIS includes all UGs and PGs enrolled in public universities in South Africa, allowing us to trace-out the share of female students in enrolment and graduation at all qualification levels in the sector. Students are classified into disciplines based on the main CESM<sup>7</sup> specialisation of their qualification. Economics forms part of the business, economics and management CESM<sup>8</sup>, the largest CESM group in both UG and PG enrolment. We use the second and third order CESM code to

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<sup>7</sup>Classification of Subject Educational Matter.

<sup>8</sup>South Africa has a three order CESM classification. The first order classifies educational matter into 20 main groupings, with the second and third order providing further specification within group. For example, first order CESM 04 represents business, economics and management studies, 0404 represents economics within the 04 group, and 040402, for example, represents the applied economics field within economics. See more [here](#).

identify economics students in this study. These are summarised in .Table 1. Specifically, we include all the 0404 CESMs and 010102, which represents agricultural economics.<sup>9</sup>

Table 1: Economics qualification CESMs

Code	Description
040401	Economics, General
040402	Applied Economics
040403	Managerial Economics
040404	Econometrics and Quantitative Economics
040405	Development Economics and International Development
040406	International Economics
040407	Natural Resource Economics
040499	Economics, Other
010102	Agricultural Economics

Table 2 presents the number of economics students by field in each year for UG and PG levels. The number of UG students decreases between 2012 and 2016, increases until 2019 to levels similar to 2012 and then decreases again year on year until 2022. These changes reflect a declining share of total UG enrolments in economics over the period from 2.2% to 1.8% (see ‘share of students’ row). On the other hand, the share of economics students within the 04 CESM follows a similar trend seen in the number of economics enrollees, indicating that the overall 04 CESM has not experienced a declining share of enrolment. The largest field is general economics, with over two thirds of students enrolled in this field in each year. This is followed by quantitative, the other group, agricultural, then applied and managerial economics, with the smallest group of students enrolled in development, international or resource economics<sup>10</sup>.

The number of PG students ranges from 2 428 to 2 936. The majority are also enrolled in the general field, however, a similar number of students, with the exception of quantitative economics, enrol in the other fields. Unlike the trend in UG enrolment, the share of PG students in economics has increased in the last three years, thus the declining trend in PG enrolment mentioned in Mouton et al. (2023) appears to have turned.

Figure 1 disaggregates these data by qualification level and gender, showing a compositional shift in the sector over time. The number of bachelor’s enrolments has decreased for both male and female students and the number of diploma enrolments has grown, especially for female students (almost three fold). The number of students enrolled in honours, master’s and PhD programs has also grown over the period, with higher growth for female students. While there are more female students enrolled in honours programs than males throughout, significant growth in female master’s enrolments has

<sup>9</sup>This is not included in Mouton et al. (2023) and may affect comparability with this study.

<sup>10</sup>The number of students in CESM 040499, i.e. other economics, declines over the analysis period and it is possible that this simply reflects that universities are doing a better job of classifying their students into the third order CESM categories rather than an actual shift in the composition of enrolment across economics fields.

Table 2: Number of students enrolled by economics field: 2012-2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>UG qualifications</b>											
General	14377	13561	12975	12675	11655	11572	12484	13761	14104	14395	13315
Quantitative	1331	1376	1554	1610	1666	2042	2086	1853	1938	1854	1802
Applied/Managerial	569	777	641	565	718	857	954	806	680	526	463
Dev/Int/Resource	182	292	210	135	206	124	201	216	153	117	244
Agricultural	994	584	927	944	1112	1250	1561	1140	1094	948	813
Other econ	2195	2279	2277	2086	2177	2040	1887	1728	1496	1245	1080
Total	19648	18869	18584	18015	17534	17885	19173	19504	19465	19085	17717
Share of 04 CESM	.073	.07	.072	.069	.069	.067	.071	.077	.072	.075	.069
Share of students	.022	.021	.021	.02	.02	.019	.019	.02	.019	.019	.018
<b>PG qualifications</b>											
General	1415	1593	1464	1466	1283	1507	1281	1221	1163	1242	1555
Quantitative	83	53	83	96	61	26	27	24	35	37	53
Applied/Managerial	277	265	267	254	218	210	191	202	221	232	267
Dev/Int/Resource	340	411	318	317	340	417	444	408	318	393	351
Agricultural	328	257	318	409	416	435	461	384	369	362	344
Other econ	334	357	307	250	357	262	382	348	322	339	317
Total	2777	2936	2757	2792	2675	2857	2786	2587	2428	2605	2887
Share of 04 CESM	.129	.121	.119	.117	.124	.129	.136	.132	.138	.148	.16
Share of students	.029	.029	.027	.026	.025	.025	.025	.024	.025	.027	.029

resulted in female enrolment surpassing male enrolment from 2020 onwards. It is only at the PhD level that there are fewer females enrolled than males. That being said, female enrolment at the PhD level has grown from 106 in 2012 to 267 in 2022, a 150% increase compared to a 60% increase for males.

Figure 1: Number of students enrolled in economics by level and gender, 2012-2022

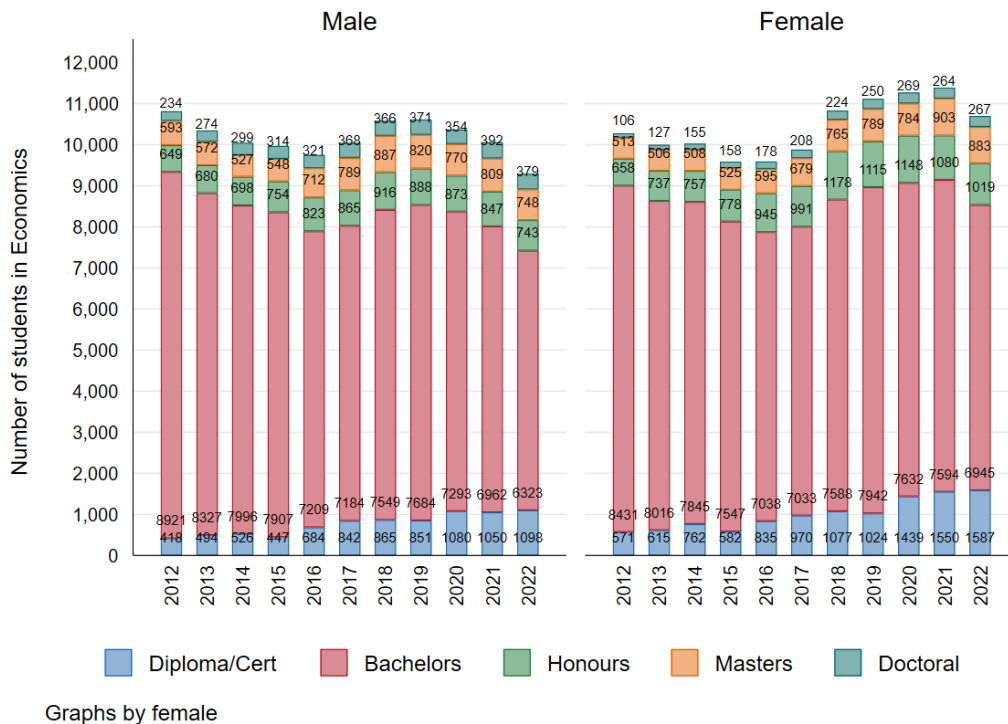


Table 3 presents a similar table to Table 2 but shows the number of graduates. The

number of economics graduates increased from 3 129 in 2012 to 3 947 in 2016, where it has remained at a similar level, with the exception of 2020 and 2021. The higher number of graduates in 2020 and 2021 could be a result of the relaxed conditions implemented during the pandemic years (Branson & Whitelaw, 2024). The number of PG economics graduates was in the mid-300s between 2012 and 2016, the mid-400s between 2017 and 2021, but dropped to 406 in 2022.

Table 3: Graduates by economics field: 2012-2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>UG qualifications</b>											
General	1954	2251	2339	2430	2501	2299	2500	2793	3020	3433	2719
Quantitative	105	52	215	274	276	249	276	230	345	311	299
Applied/Managerial	255	244	238	249	279	336	375	261	326	208	167
Dev/Int/Resource	99	80	78	69	107	59	101	107	95	66	124
Agricultural	313	147	186	257	312	326	395	287	379	296	265
Other econ	403	379	370	393	472	493	453	370	502	405	420
Total	3129	3153	3426	3672	3947	3762	4100	4048	4667	4719	3994
Share of 04 CESM	.072	.067	.071	.071	.073	.069	.071	.072	.074	.076	.07
Share of students	.02	.019	.02	.021	.021	.019	.02	.02	.021	.022	.019
<b>PG qualifications</b>											
General	144	111	127	143	176	195	221	165	199	211	191
Quantitative	15	10	22	12	8	5	4	1	7	6	5
Applied/Managerial	37	40	36	40	36	31	28	37	38	36	49
Dev/Int/Resource	35	44	44	22	23	51	62	85	66	65	36
Agricultural	44	45	53	84	81	91	96	67	78	71	61
Other econ	80	83	69	32	39	54	67	101	72	69	64
Total	355	333	351	333	363	427	478	456	460	458	406
Share of 04 CESM	.129	.122	.124	.106	.105	.119	.127	.131	.136	.133	.111
Share of students	.029	.026	.025	.023	.023	.027	.028	.027	.028	.026	.023

## 3.2 Staff

The HEMIS staff data comprise all staff employed in the public university sector. Instructional and research staff can be distinguish from non-academic staff, and the data contains information on staff demographics (gender, race, age), qualification level (PhD, master's, honours, etc.) and rank (professor, associate professor, senior lecturer, etc.). Staff are classified as in the economics discipline based on time spent teaching or doing research in economics CESMs (as per Table 1). We count a staff member as an economics head if they spend a non-zero amount of time teaching or doing research in an economics CESM. The staff FTE measure, on the other hand, factors in the share of time spent in economics CESMs. We use staff FTEs throughout the remainder of the analysis to limit the number of tables and figures. Section A.2.1 in the Appendix provides a discussion about the limitations associated with CESM categories for identifying staff in economics.

Table 4 presents information on the number of permanent staff FTEs and heads by institution type and year for a couple of CESM groups. The range of activities across UG and PG levels determines institution type: Teaching-led (university of technology), comprehensive (comprehensive university), or research-led (traditional

university) (DHET, 2022). The predominant teaching modality at all institutions in South Africa, except UNISA, is face-to-face (contact learning). Table 4 shows that most economics staff are based at traditional universities (TUs) and that the number of staff (both by FTE and head) has grown over the analysis period. Economics staff represent between 3 and 4% of the permanent staff body at TUs<sup>11</sup>.

Table 4: Staff FTE and heads by university type and discipline: 2012-2020

Year	Inst.	FTEs						Heads					
		Econ	Law	Comp	Hlth	Eng	Oth	Econ	Law	Comp	Hlth	Eng	Oth
2012	TU	265	392.8	199.4	1275.6	438.9	6796.7	425	507	268	1848	606	8803
2013	TU	285	384.3	200.8	1187.6	462.1	7086.3	440	507	282	1845	637	9296
2014	TU	266.8	411.6	217.2	1206	469.6	7064.1	433	533	307	1867	639	9288
2015	TU	279.1	403.8	227.7	1270.9	489.6	7141.7	438	520	334	1833	668	9371
2016	TU	280.1	410.6	228.4	1327.3	508.3	7323.9	455	535	343	1965	702	9754
2017	TU	328.7	412.2	224.1	1451.3	515	7378	524	550	329	2159	709	9857
2018	TU	311.9	420.1	234.2	1426.4	507.5	7489.5	532	554	349	2188	701	9985
2019	TU	353	423.9	235.4	1448.1	494.7	7495.2	533	566	345	2156	698	9916
2020	TU	357	443.6	243.1	1474.9	500	7949.9	553	582	350	2190	719	10407
2021	TU	422.8	432.5	248.9	1481.3	506.2	7884	631	566	356	2213	723	10367
2022	TU	627.2	445	262.4	1526.1	520	7616.5	803	581	354	2156	696	9915
2012	CU	59	89.1	161.9	157.7	202.1	2012.8	91	115	227	231	257	2533
2013	CU	54.6	90.5	159.6	157.6	175.8	2013.1	87	119	221	239	241	2623
2014	CU	66	98.8	160.7	180.8	195.3	2163.8	106	129	232	264	265	2743
2015	CU	65.9	102	163.2	174.2	197.8	2233.9	107	132	237	267	276	2814
2016	CU	67	105.8	161.8	170.2	212.7	2328.7	112	138	245	266	297	2955
2017	CU	80.6	116.3	164	173.6	226.3	2400.8	132	150	245	263	311	3040
2018	CU	82.5	118	183.1	180.6	222.1	2472	126	154	275	271	298	3137
2019	CU	89.7	123.3	198.9	186.8	222	2544.7	141	159	288	273	300	3233
2020	CU	94.5	131.8	194.2	230.6	237	2845.8	154	174	297	347	330	3566
2021	CU	100.5	134.8	214.5	242.7	236.2	2911.9	166	173	315	362	329	3670
2022	CU	100.5	130.4	212.8	265.5	233	2928.1	165	175	313	400	323	3710
2012	UoT	32.6	54.5	235.9	147.9	388.1	2029.4	65	93	361	239	565	2750
2013	UoT	34.7	57.4	238.2	145.4	398.3	2111.1	70	98	376	229	566	2856
2014	UoT	41.1	57.9	240.2	163.4	411.1	2229.4	74	95	373	242	576	2898
2015	UoT	41.1	58.9	225.8	162.7	404.8	2160.9	70	91	360	262	580	2886
2016	UoT	36.7	57.2	258.6	174.9	432.4	2180	67	96	391	271	604	2958
2017	UoT	39	56.7	257.4	184.3	434	2188.5	75	102	382	277	604	2969
2018	UoT	37.6	54.3	251.6	183.9	430.5	2190.9	73	98	369	279	606	2943
2019	UoT	36	55	247.8	188.2	424.1	2160.5	70	100	371	296	601	2924
2020	UoT	29.7	55.1	251.1	195.1	435.8	2226.2	69	105	375	306	618	2995
2021	UoT	27.2	61.8	248.8	197.6	408.8	2218	62	108	384	310	595	3032
2022	UoT	31.1	59.3	234.3	211.4	416.5	2213.8	66	112	360	339	606	3001
2012	UNISA	32.2	124.8	56.5	24.7	38.5	1226.8	40	168	89	40	63	1530
2013	UNISA	31.4	122.6	67.6	29.5	43.4	1273.1	39	161	99	42	68	1546
2014	UNISA	36.6	132.8	66.7	29.2	48.4	1328.2	46	173	101	40	74	1603
2015	UNISA	33.3	125.2	62.8	29.3	45	1377.3	62	170	89	38	70	1658
2016	UNISA	31.3	127.7	62.2	29	49.8	1432.4	59	173	87	38	74	1722
2017	UNISA	22.8	67.2	37.5	34.6	37.1	856.4	64	173	100	42	69	1443
2018	UNISA	25.2	98.1	35.6	33.9	38.9	935.8	56	168	103	51	64	1483
2019	UNISA	22.2	70.4	30.5	32.9	32.8	742.1	76	157	111	66	73	1517
2020	UNISA	19.6	65	29.7	31.1	39.9	785	71	145	109	52	91	1569
2021	UNISA	16.7	46.7	31.6	15.9	31.2	670.9	64	129	103	44	86	1579
2022	UNISA	35.4	90	63.5	31.7	52.1	1573.5	78	137	108	49	89	1885

Permanent teaching and research staff only. Comp abbreviates Computer and Information Sciences.

The number of economics staff at comprehensive universities (CUs) has also grown over the analysis period, but from a lower base. In 2012, there were 59 staff FTEs

<sup>11</sup>The large increase in economics heads and FTEs in 2022 is driven by an unlikely increase in staff at NWU. In the analysis we exclude the 2022 NWU data point.

in economics at CUs, and in 2022, there were 100.5 FTEs representing about 2.5% of permanent staff. The number of FTEs at University of Technologies (UoTs) and UNISA has remained similar over the analysis period at around 30. At UoTs, this equates to 65 to 75 heads per year, the difference signalling that staff work across a range of CESMs at UoTs. This may be why Yu's (2017) analysis of economics departments excludes UoTs (i.e. if UoTs do not contain economics departments per say and economics rather forms part of other discipline's syllabus). At UNISA on the other hand, the number of economic heads has almost doubled over the analysis period, while the FTEs has remained stable, suggesting a change in the structure of teaching and/or research composition of staff (or inaccuracy in the time use data).

### 3.3 Research outputs

We use two data sources for the research output section. The first is the South Africa Knowledgebase (SAK) at CREST (The Centre for Research on Evaluation, Science and Technology):

“SAKnowledgebase by CREST, Stellenbosch University, is a comprehensive database of research output produced by the South African universities from 2005 onwards, and specifically research outputs (articles, books, book chapters and conference proceedings) that were submitted to the DHET for subsidy. It includes the demographics of authors (gender, race, age, and institution) as well as specialised journal information. Relevant authors in each field are identified based on the available departmental affiliations of authors in SAKnowledgebase, as well as by sourcing the names of academic staff in the field from the university websites and incorporating that information into SAKnowledgebase” (Mouton et al., 2023, p. 104).

Thus our definition of economics in this case is based on the departmental affiliation provided by institutions for each staff publication and does not use the CESM approach used to identify staff teaching or doing research in economics. As such, it is not possible to compare the number of authors from economics departments with publications to the number of staff members teaching or doing research in economics CESMs.<sup>12</sup>

The second source of information is Scopus. We restrict our search in Scopus by the following parameters: Final, peer-reviewed journal articles published in English in journals classified as being in the field of ‘Economics, Econometrics and Finance’. We search for articles between 2012 and 2022 in which at least one of the authors has an affiliation based in South Africa. We then restrict authors to those who publish under a South African affiliation between 2012 and 2022. This yields 8 144 publications and 6 140 unique authors.

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<sup>12</sup>See discussion in the appendix (Section A.2.2) for more.



To supplement this data with authors' gender, we used Namsor, a name-checking technology that returns the probability of an author's name being male or female.<sup>13</sup> The feature returns the most likely gender accompanied by a calibrated probability. If the probability of the returned gender is between 45% and 55%, the name can be interpreted as a unisex name. Over half of the names we entered have a calibrated probability of over 95%. To maintain as much accuracy as possible, we keep the most likely gender of those with probabilities greater than 91%, and create a category called 'undetermined' for those with lower probabilities.

It is important to note that the number of authors captured in the Scopus data is not comparable to the SAK data for a number of reasons. First, authors affiliated with private institutions and organisations are included in our Scopus dataset, whereas the SAK data captures authors affiliated with public institutions only. Second, the SAK data includes publications from authors affiliated with economics departments only, while the Scopus database include authors from any field who choose to publish their work in the field of economics, econometrics or finance. Lastly, the journal field restriction included 'finance' and thus is not entirely comparable to the departmental affiliation approach used in SAK.

The SAK and Scopus databases provide complementary insights into the economics research landscape, however. SAK focuses on subsidy earning research outputs produced by staff from public higher education institutions and includes demographic data on gender, race and age group. Scopus extends this scope by including researchers with any South African affiliation – thus extending the scope beyond public institutions. It also adds coauthorship and citation impact metrics not available in the SAK data that we have access to. Together, these datasets enable a comprehensive analysis of both demographic patterns and the broader reach and influence of economics publications in South Africa.

## 4 Results: Economics students

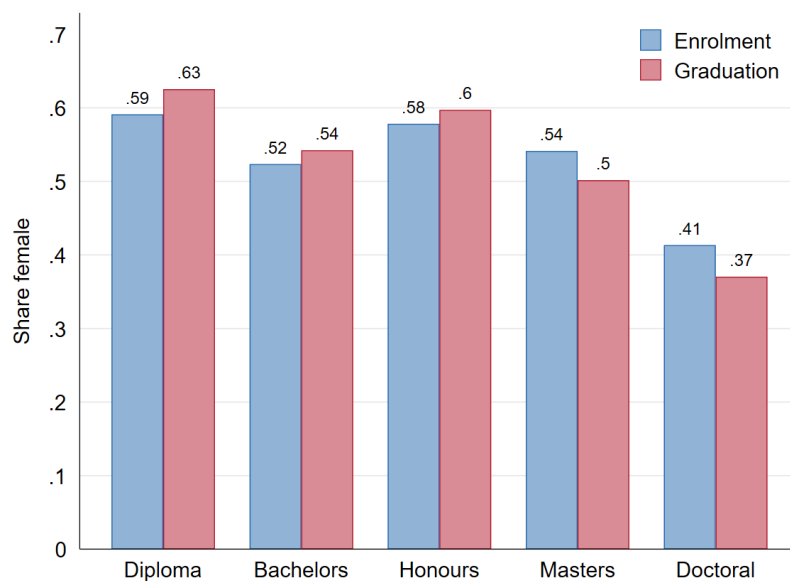
In this section, we map out the composition of students enrolled and graduated between the years 2012-2022 by gender, race, economics field, and institution type. Figure 2 provides a snapshot of the share of females enrolled and graduating in economics at different qualification levels in 2022. The figure shows an optimistic picture in terms of female representation in economics for both enrolment and graduation. In fact, a larger share of women than men are enrolled at diploma, bachelor's, honours and master's level in 2022. Furthermore, the share of females graduating at qualification levels below master's is even higher than their representation in enrolment, signalling better graduation rates among females than males at these levels.

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<sup>13</sup>An evaluation of Namsor accuracy was done by Science Metrix for Elsevier and the European Commission. Namsor was found to be most accurate for a large diversity of international names.

Although gender parity is reached (and exceeded) at UG (diplomas, bachelor’s, and honours<sup>14</sup>) level in both enrolment and graduation, the picture is less optimistic at the PG level. The share of female students enrolled in PhD programmes is 41%, and the share graduating is 37%. Women are therefore under-represented in both enrolment and graduation at the PhD level. Furthermore, while the female share of enrolment at master’s level is 54%, the share of females among master’s graduates is 50%, signalling that female students are lagging behind their male peers in graduating at this level. We unpack these patterns, together with trends over time, in the following sections.

Figure 2: Female share of enrolments and graduations in economics by level, 2022



#### 4.1 Gender ratios in enrolment and graduation

Variation in the public higher education system in South Africa is important to understand before assessing gender equity in enrolment across higher education institutions. This variation arises because the public higher education system in South Africa has been intentionally differentiated in order to address a wide range of emerging skills and knowledge needs (e.g. TUs, CUs, UoTs) (Council on Higher Education, 2013). TUs and CUs typically award bachelor’s degrees (some institutions offering diploma and certificate qualifications too). The majority of qualifications awarded at UoTs, on the other hand, are diplomas and certificates (80% in 2021) (Council on Higher Education, 2023). Around two thirds of the qualifications awarded by UNISA are degrees (this fell to approx. 63% in 2021 from approx. 72% in 2016) (Council on Higher Education, 2023).

<sup>14</sup>We choose to include honours economics qualifications as part of UG qualifications because the completion of a four year UG qualification in economics is equivalent on the NQF to completing a three year undergrad plus a 1 year honours. Given that we cannot classify students in 4-year UG qualifications as PG in year 4, we rather group honours with UG qualifications.

Different institution types also have different entrance requirements and fee structures, which can influence the composition of the student body, as will the geographical location of the institution itself. Moreover, because TUs are research-intensive, they could be thought of as key for training a pipeline of academic economists. CUs would lie somewhere in-between the TUs and more teaching and practical orientated UoTs.

This variation introduces a complexity in assessing gender equity in enrolment across higher education institutions in South Africa. First, the racial composition of students differs across institution type. For example, in 2022, 68% of students enrolled in economics at TUs were Black African, compared to 96% in CUs, 98% in UoTs and 85% in UNISA. On the other hand, White students represented 19.6% in TUs, 6% in UNISA, 1.3% in CUs and 0.28% in UoTs. Race is therefore an important dimension for our analysis. A student's race in HEMIS is reported by institutions, but there has been an increasing trend amongst students in recent years to not declare their race. For this reason we include an 'other/unknown' category as well as Black (Black African unless stated otherwise), Coloured, Indian/Asian and White categories.

Second, the core subject matter of economics offerings across institution types also differs. For example, in 2022, all institution types have a high enrolment share in general economics (74%, 64.5%, 96% and 69% in TUs, CUs, UoTs and UNISA), but the second largest field differs – at TUs it is agricultural economics (10.8%), while it is other economics at CUs (13.8%), development, international and resource economics at UoTs (2.66%) and quantitative economics at UNISA (28.5%). Because of these differences, when considering the gendered dimension to economics enrolment we include a consideration of differences by institutional type, economics field, and race.

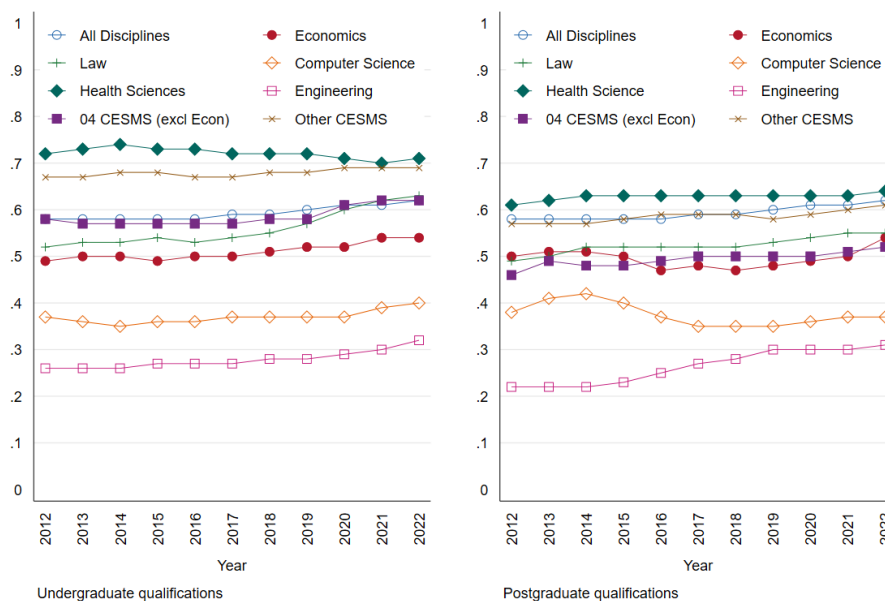
To situate economics enrolment within the university space, Figure 3 tracks the share of female enrolment by discipline for students across all 26 public universities. Gender parity in UG economics enrolment was reached in 2013, and by 2018 female enrolment exceeded male enrolment. The share of females in economics is, however, lower than in the business, economics and management studies (04 CESMs) more broadly (excluding economics). The share of females enrolled in PG economics programmes hovers around the 50% mark and is similar to the 04 CESM (excluding economics) category.

Only two of the CESM groupings presented in Figure 3 have female representation below 50%. These are computer science and engineering. Appendix Figure A1 shows that when we examine all 20 undergraduate CESMs, only four have a higher share of males than females. These are engineering, computer and information science, mathematics and statistics, and architecture and the built environment. The pattern is similar for PG qualifications (as of 2019), with females also being under-represented in agriculture.

The aggregate economics trend line masks some heterogeneity in female representation across fields within economics, although all but one area of UG economics reached or surpassed gender parity by 2019. Figure 4 shows that the only field of UG economics

Figure 3: Female share of enrolment by discipline (CESM), 2012-2022

Share of females enrolled by discipline: 2012-2022



Note: Undergraduate qualifications comprise diploma, bachelor's, and honours. Postgraduate qualifications include master's and PhDs. The 04 CESMs are business, economics and management studies.

where women are not (at least) equally represented in 2022 is agricultural economics. Female students represented 55% of enrolment in quantitative economics in 2022 – the field that saw the largest increase in female representation over the analysis period (from 46% in 2012 to 55% in 2022).

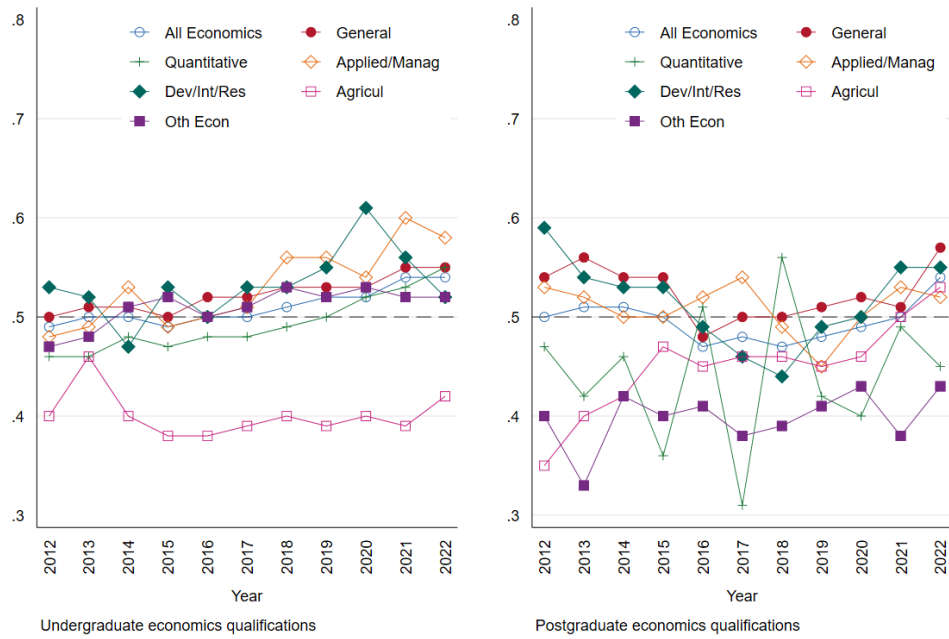
At PG level, the 'other' group had the lowest share of females throughout the period, and females represented 43% of this group in 2022. The trend for general economics, development, international and resource economics, and applied/managerial economics is u-shaped: higher female representation in 2012 reducing over the decade, before increasing again in the 2020s. Finally, the share of women in PG agricultural economics increases from 35% in 2012 to 48% in 2015, hovers there until 2020 and then increasing to 50% in 2021 and 53% in 2022.<sup>15</sup>

Figure 5 assesses gender ratios in economics by race. The low share of females within the White group stands out, with women representing only 36% of White UG economics enrolment in 2022, compared to 68% among Black students and 49% and 46% among Coloured and Indian students, respectively. A similar distinction is evident at the PG level although the share of females in the other/unknown race group is also below the other race groups. The share of female enrolment within the White group also increases from 2017 such that by 2022, about 48% of PG enrolment is attributed to female students.

<sup>15</sup>Variation likely reflects low enrolment in certain fields, e.g. quantitative economics (see Table 2).

Figure 4: Female share of enrolment by economics field, 2012-2022

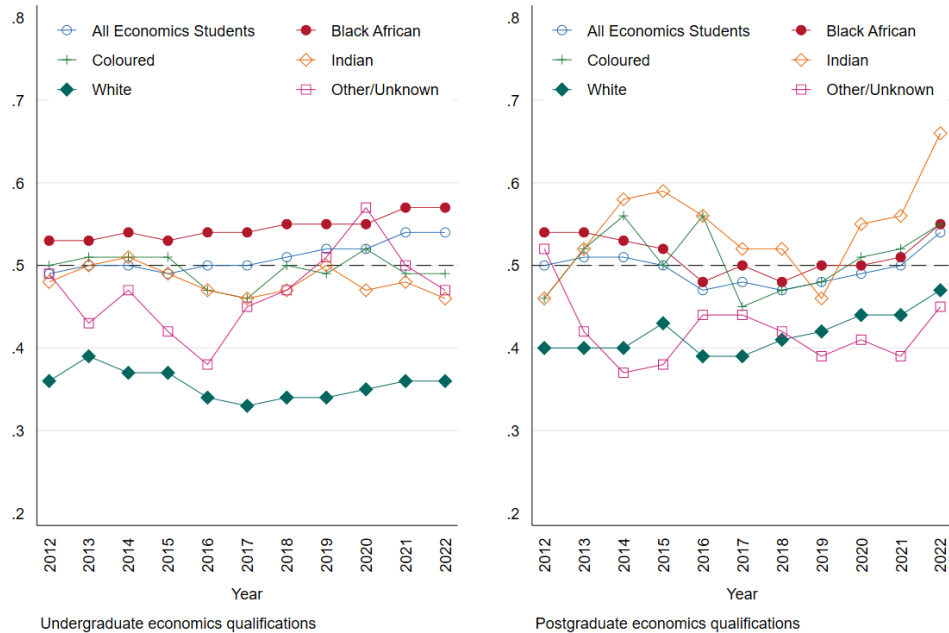
Share of females enrolled by field: 2012-2022



Note: Undergraduate qualifications comprise diploma, bachelor's, and honours level qualifications. Postgraduate qualifications include master's and PhDs.

Figure 5: Female share of economics enrolment by race, 2012-2022

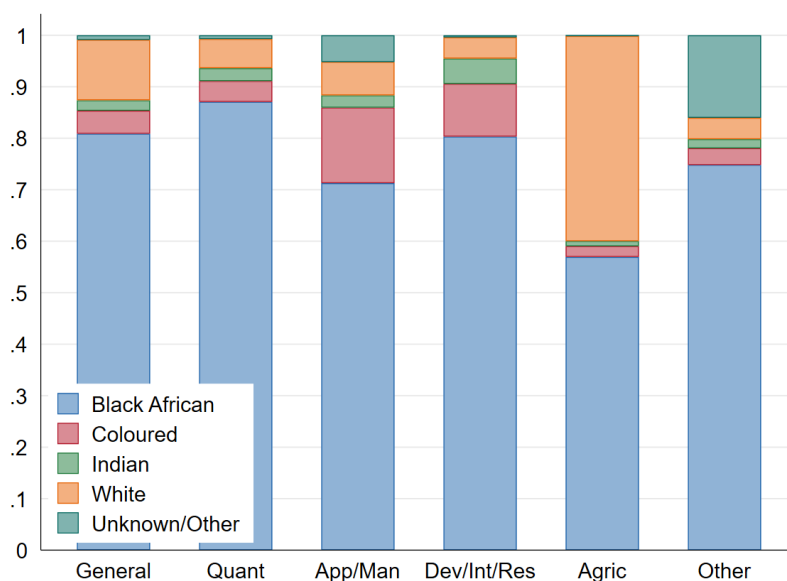
Share of females enrolled by race: 2012-2022



Note: Shares for female enrolment are within race categories. Undergraduate qualifications comprise diploma, bachelor's, and honours. Postgraduate qualifications include master's and PhDs.

Figure 6 shows the racial distribution by field in UG economics in 2022. We see that the share of White students in agricultural economics is much higher than other fields (40% compared to less than 12% in any of the other fields). Thus the lower representation of females evident in agriculture economics in Figure 4 could partly be a function of the racial composition (the share of females among White students is low). Or, the lower female representation among White students could partly be a function of the higher share of White students in agriculture economics. Indeed, when White students are excluded, the share of females in agriculture, agricultural operations and related sciences rises from approximately 42% to 53% in 2022 (not shown).

Figure 6: Racial distribution within economics fields, 2022



Note: Quant abbreviates quantitative economics. App/Man abbreviates applied and managerial economics. Dev/Int/Res abbreviates development, international and resource economics. Agric abbreviates agricultural economics.

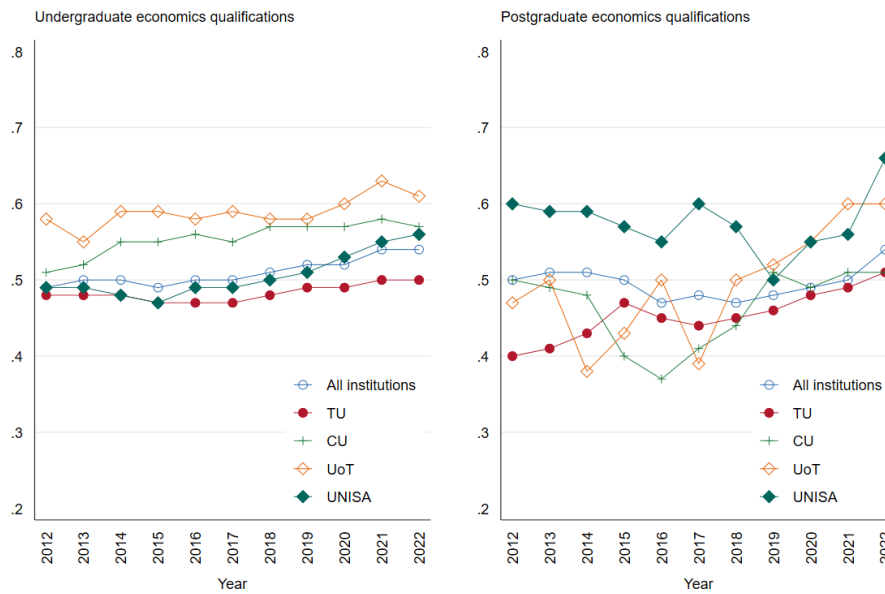
Figure 7 presents gender ratios in economics enrolment by institution type. All institution types have reached gender parity by 2021 at both the UG and PG level. At the UG level, the share of female students is highest at UoTs, followed by CUs and UNISA, and the lowest female representation is at TUs. For PG studies, the share of females in 2022 is highest at UNISA and UoTs, but the trends at CUs, UoTs and UNISA are more noisy due to smaller PG student samples.

Figure 8 presents gender ratios in graduation overall and by race. At the UG level, a larger share of economics graduates are female throughout the period, with the trend distinctly upward from 2017 such that by 2022, 57% of graduates from UG economics are female.

The pattern differs, however, within race groups. Women are under-represented in graduation (as they were with enrolment) among White students, representing around

Figure 7: Female share of economics enrolment by institution type, 2012-2022

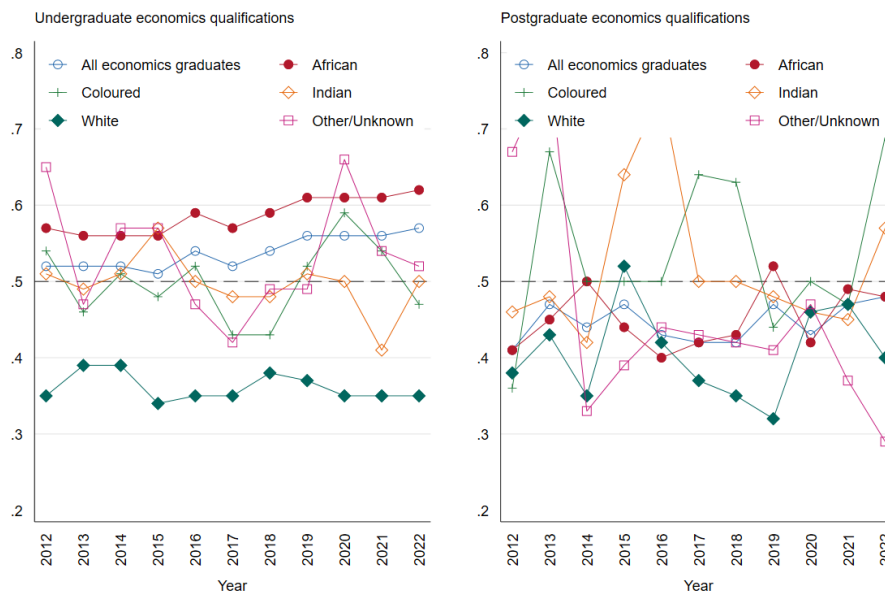
Share of females enrolled by institution type: 2012-2022



Note: Undergraduate qualifications comprise diploma, bachelor's, and honours level qualifications. Postgraduate qualifications include master's and PhDs.

Figure 8: Female share of economics graduates by race, 2012-2022

Share of females graduating by race: 2012-2022



Note: Undergraduate qualifications comprise diploma, bachelor's, and honours level qualifications. Postgraduate qualifications include master's and PhDs.

35% of White graduates, with the trend fairly constant over the period examined. In comparison, the share of women is 62% among Black graduates and close to 50% for

Indian and Coloured graduates in 2022. The share of Black females graduating is higher than the share enrolling, indicating that Black females are graduating at a higher rate than Black males. The share of females enrolling and graduating is similar for Indian, Coloured and White students. The graduation gender ratios by institution type have a similar ordering to enrolment (not shown here).

## 4.2 Profiling student characteristics, by gender

In the previous subsection, we mapped gender ratios overall and by qualification level, race, economics field and institution type. A majority of UG graduates were female, with a more nuanced picture evident at PG level. A number of factors could contribute to this, including the type of UG qualification in which female students enrol (e.g. diploma, bachelor's, or honours), the field and its perceived difficulty, the type of institution at which students enrol, and students socioeconomic status measured here by their race, average income of their home postal code, and their school-leaving performance.

Tables 5 and 6 present student characteristics (UG and PG combined): overall (top panel), for females (middle panel) and males (bottom panel) separately to uncover any potential drivers of differential rates of enrolment and graduation. Table 5 shows the qualification, field and institutional composition among economics students, and Table 6 profiles students' background characteristics.

The majority of enrolment is at the bachelor's degree level for both females and males in all years, e.g. 65% and 68% for females and males respectively in 2022. There has, however, been a noticeable increase in the share of students enrolling in diploma qualifications over the period – from 5% in 2012 to 13% in 2022 overall and from 6% to 15% for females and 4% to 12% for males, almost three-fold increases. In fact, there has been an increase at all qualification levels, with the exception of bachelor's. The share of doctoral students has doubled, albeit from a low base, for both males and females.

Half of economics enrolment is at TUs, with the rate higher for males than females (e.g. 54% vs 47% in 2022). Women, on the other hand, have a marginally higher share of enrolment in CUs compared to male students (22% vs 20% in 2022) and at UNISA (25% vs 22% in 2022). The distribution across economics fields is similar for males and females, with shares only differing for general and agricultural economics – females having a higher representation in general economics (73% vs 71% in 2022) and males in agricultural economics (5% vs 7% in 2022).

The panel on the right presents the characteristics of graduates, with differences driven, in part, by program length. For example, diplomas and honours programmes are typically shorter than bachelor programmes, and thus the share of students graduating in the former is higher within the graduation panel than the enrolment panel. TUs and CUs are also 'over-represented' in the graduate columns, especially for females, with the



Table 5: Qualification, field &amp; institutional composition of economics students: 2012-2022

	Enrolled			Graduated		
	2012	2017	2022	2012	2017	2022
<b>(a) All students</b>						
Female	.49	.5	.54	.51	.51	.56
Qualification level						
Diploma	.05	.09	.13	.06	.11	.15
Bachelor Degree	.82	.71	.66	.65	.59	.55
Honours	.06	.09	.09	.19	.2	.21
Master's	.05	.07	.08	.09	.08	.07
Doctoral	.02	.03	.03	.01	.02	.02
Economics field						
General	.7	.63	.72	.6	.6	.66
Applied or managerial	.06	.1	.09	.03	.06	.07
Quantitative	.04	.05	.04	.08	.09	.05
Development, international, resource	.02	.03	.03	.04	.03	.04
Agriculture	.06	.08	.06	.1	.1	.07
Other econ	.11	.11	.07	.14	.13	.11
Institution type						
TU	.47	.49	.5	.63	.57	.56
CU	.16	.24	.21	.24	.26	.28
UoT	.04	.07	.05	.06	.11	.06
UNISA	.34	.2	.24	.06	.07	.1
Number of students	22425	20742	20604	3484	4189	4400
<b>(b) Female students</b>						
Qualification level						
Diploma	.06	.1	.15	.07	.12	.17
Bachelor Degree	.82	.71	.65	.65	.59	.53
Honours	.06	.1	.1	.2	.21	.22
Master's	.05	.07	.08	.07	.07	.07
Doctoral	.01	.02	.02	.01	.01	.01
Economics field						
General	.72	.65	.73	.64	.62	.66
Applied or managerial	.06	.1	.09	.03	.06	.07
Quantitative	.04	.05	.04	.08	.09	.05
Development, international, resource	.03	.02	.03	.04	.03	.03
Agriculture	.05	.07	.05	.08	.08	.06
Other econ	.11	.11	.06	.13	.13	.11
Institution type						
TU	.44	.46	.47	.63	.53	.52
CU	.16	.26	.22	.23	.28	.31
UoT	.04	.08	.06	.07	.13	.07
UNISA	.35	.2	.25	.06	.06	.1
Number of students	11059	10357	11117	1776	2120	2464
<b>(c) Male students</b>						
Qualification level						
Diploma	.04	.08	.12	.04	.1	.13
Bachelor Degree	.82	.71	.68	.64	.59	.57
Honours	.06	.09	.08	.19	.19	.19
Master's	.05	.08	.08	.1	.09	.08
Doctoral	.02	.04	.04	.02	.03	.03
Economics field						
General	.68	.61	.71	.56	.57	.66
Applied or managerial	.07	.1	.09	.04	.06	.06
Quantitative	.04	.05	.03	.09	.09	.05
Development, international, resource	.02	.03	.03	.03	.03	.04
Agriculture	.07	.1	.07	.13	.12	.09
Other econ	.12	.11	.07	.15	.14	.11
Institution type						
TU	.49	.53	.54	.63	.61	.61
CU	.15	.22	.2	.25	.23	.25
UoT	.03	.05	.04	.05	.08	.05
UNISA	.33	.2	.22	.06	.07	.09
Number of students	11365	10385	9485	1708	2069	1936

share at UNISA lower.

Table 6 shows that the average age of students has declined by about a year between 2012 and 2022 and that female students are younger than males, on average. The racial composition of economics students has also changed over the period, with the share of Black students increasing and the share of all other race groups declining. The racial composition differs for females and males, although both groups have experienced a similar growth in Black students over time. In 2022, 84% of females are Black, compared to 75% of males. Average income and education (from the 2011 Census information) of the students' postal codes is lower among female students than male students and decreases for both genders over time. The number of female graduates has increased steadily across the three years, but dropped in 2022 for males.

Table 6: Economics student characteristics: 2012-2022

	Enrolled			Graduated		
	2012	2017	2022	2012	2017	2022
<b>(a) All students</b>						
Share female	.49	.5	.54	.51	.51	.56
Age	25.38	25.39	24.2	25.27	25.68	24.49
Race						
Black	.69	.75	.8	.67	.72	.76
Coloured	.05	.04	.04	.05	.05	.05
Indian	.06	.04	.02	.05	.03	.03
White	.19	.15	.12	.22	.18	.14
Other	.01	.02	.02	.02	.02	.02
Postcode income 2011 (ZAR)	171368	147646	143129	164793	150251	143629
Postcode avg years of educ 2011	7.49	7.16	7.11	7.33	7.14	7.09
Number of students	22425	20742	20604	3484	4189	4400
<b>(b) Female students</b>						
Age	24.93	24.95	23.81	24.76	25.29	24.08
Race						
Black	.74	.81	.84	.73	.79	.82
Coloured	.05	.04	.04	.05	.04	.04
Indian	.06	.04	.02	.05	.03	.03
White	.14	.1	.08	.15	.12	.09
Other	.01	.02	.02	.02	.02	.02
Postcode income 2011 (ZAR)	163193	141220	136248	154643	143068	133946
Postcode avg years of educ 2011	7.45	7.13	7.06	7.27	7.09	7.02
Number of students	11059	10357	11117	1776	2120	2464
<b>(c) Male students</b>						
Age	25.82	25.84	24.66	25.8	26.08	25.02
Race						
Black	.64	.7	.75	.6	.65	.68
Coloured	.05	.05	.05	.05	.05	.06
Indian	.06	.04	.02	.05	.03	.03
White	.24	.19	.16	.28	.23	.21
Other	.01	.02	.03	.01	.03	.02
Postcode income 2011 (ZAR)	179551	154210	151286	175577	157786	156115
Postcode avg years of educ 2011	7.52	7.19	7.16	7.39	7.2	7.17
Number of students	11365	10385	9485	1708	2069	1936

The increasing representation of female students in economics has coincided with the growing inclusion of previously marginalised racial groups and students from lower socioeconomic backgrounds. Female students are now represented across almost all types of institutions and fields within economics at master's level and below. An exception is

White females, who remain under-represented in economics overall, particularly due to lower enrolment in agricultural economics. The only area within economics where females remain under-represented is in PhD programs. Consequently, the next section examines trends in female representation at the PhD level to determine whether PhD programs will soon achieve parity with other programs in terms of representation.

### 4.3 Trends in the PhD gender gap

Gender parity has been reached (or surpassed) at all but the PhD level.<sup>16</sup> We now take a closer look at trends in female enrolment and graduation at the master's and PhD level. Do female students encounter difficulties in making the transition from master's to PhD, or will the current under-representation of females naturally change given the upward trajectory of female representation at lower academic levels?

Figure 9 tracks the share of females enrolled in economics master's and PhD programmes over time. Master's programmes have been at close to gender parity for much of the period, with the share of females enrolled in master's programmes surpassing that of males in 2021. On the other hand, the share of females enrolled in PhD programmes was around 30% in 2012, but has grown strongly over the period, reaching a high of 44% in 2020 before dropping closer to 40% thereafter. Figure 10 illustrates that a similar pattern is evident in the number of students graduating. A similar number of male and female students graduate from master's programs, while the number of female PhD graduates is lower but converging towards the number of male graduates over time.

Given that the time to completion of a PhDs can be variable, in Figure 11 we plot the share of new PhD enrolments by gender. Again there was strong growth in female PhD enrolment at least until 2019, but the trend has been downward since then. Male new PhD enrolment oscillates between 80 and 120, with no apparent trend. In 2022, 59 new female and 84 new males economics PhDs enrolled.

Finally, in Figure 12 we plot the conversion rate from master's to PhD. This represents new PhD enrolments as a share of the average number of master's graduates in the last three years. As such, it represents a measure of the flow of students from master's to PhD programmes<sup>17</sup>. The female and male rates converge over the period. Male rates decline and female rates increase until 2017, and then decline slowly for both genders thereafter. By 2022, the conversion rate is about 40%, and similar for males and females.

Figures 9 to 12 suggest that the current under-representation of females in economics PhD programs is likely to change in the near future. Females are surpassing males in master's enrolment and are keeping pace in graduating from these programs as well. The

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<sup>16</sup>Mouton et al. (2023) report that enrolment in economics PhDs has been rising consistently since 2012, reaching 54% in 2020. However, it appears that this may be for South African PhD students only. The share of South African PhD students has been declining over time (Mouton et al., 2023).

<sup>17</sup>See Section A.2.3 for details.

Figure 9: Female share of enrolment in master's and PhD programmes, 2012-2022

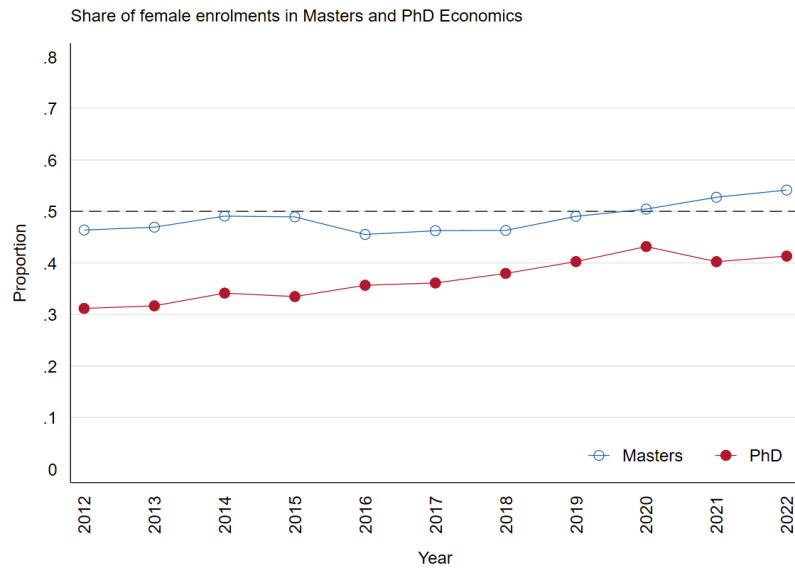
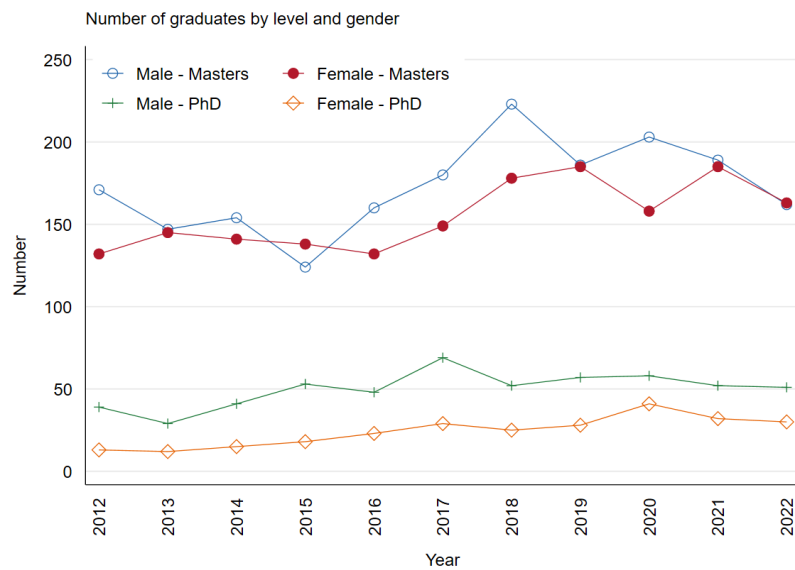


Figure 10: Number of economics graduates by postgraduate level and gender, 2012-2022



number of female PhD enrolments has grown significantly over the period, leading to a convergence in the share of master's students enrolling in PhD programs. However, one potential concern is the reduction in new PhD enrolments over the past three years.

Figure 11: Number of new economics PhD enrolments by gender, 2012-2022

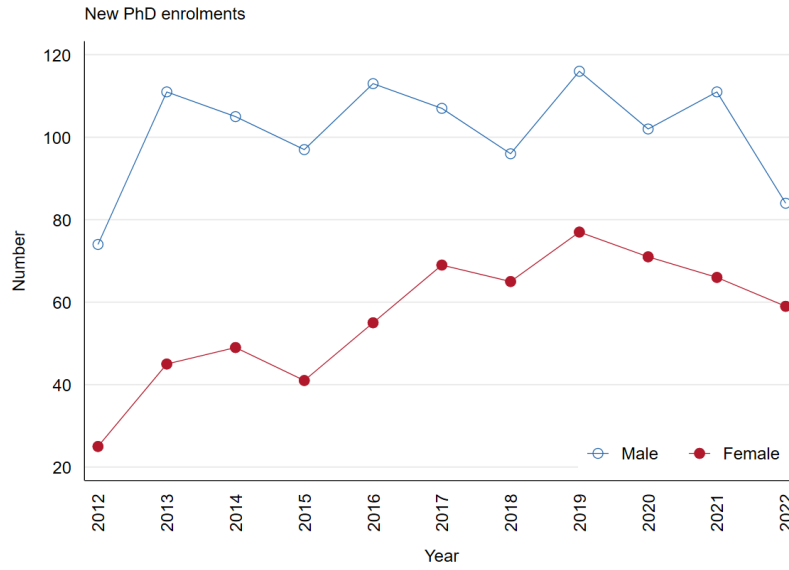
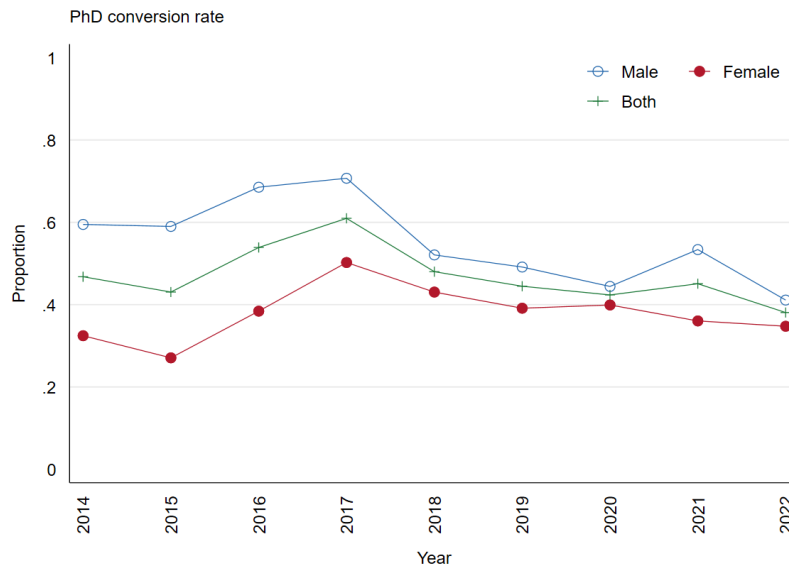


Figure 12: Master's graduate to PhD enrolment conversion rate by gender, 2012-2022



## 5 Results: Economics staff

Having explored the trends and dynamics of student enrolment and graduation in economics, we turn our attention to the composition and characteristics of academic staff within the field. Economics staff are identified via their CESM programme involvement and we present summary measures based on full time equivalents (FTEs). Throughout this section, we restrict our analysis to permanent research and teaching staff.

## 5.1 Staff gender ratios by discipline, institution type and rank

Figure 13 presents the number of staff FTEs in economics across all public universities in South Africa by gender between 2012 and 2022. The number of male economics staff FTEs has increased from 382 to 533, a 40% increase, while the number of female economics FTEs increased from 239 to 419, a 75% increase.

Figure 13: Number of economics staff FTEs by gender, 2012-2022

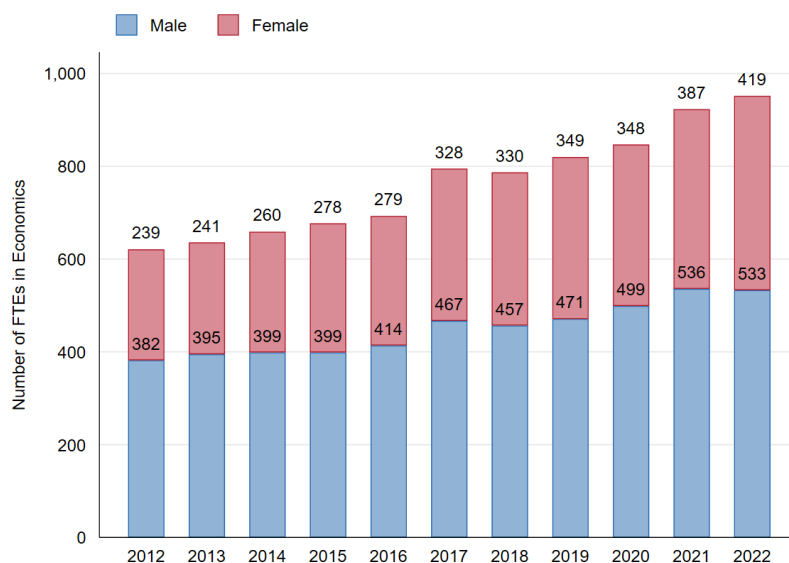


Figure 14 presents trends in the share of female staff over time for a subset of disciplines. The discipline with the highest share of female staff is health sciences, followed by law. The engineering discipline has made some progress towards gender parity since 2012, but remains behind all other disciplines in this regard. The share of female staff in economics oscillates around the 40% mark throughout the period. In 2022, the share sits at 42% up from 38% in 2012. Female representation in economics therefore falls somewhat toward the lower performers among the disciplines presented, comparable with computer and information sciences.

Figures 15 and 16 present trends in the share of female staff by institution type. TUs and CUs have similar trends in the share of women across disciplines to the overall figure. For UoTs, the share of females in economics is between 30 and 40% throughout the period. On the other hand, the share of female staff in economics at UNISA increases steadily from 37% in 2012 to almost 59% in 2022. The staff gender composition of other fields at UNISA remains relatively stable, with the exception of health science, where the share of female staff decreases from 85% in 2012 to 70% in 2022, the latter more comparable to health science gender ratios at other institution types.

Figure 14: Share female economics FTEs by discipline (CESM), 2012-2022

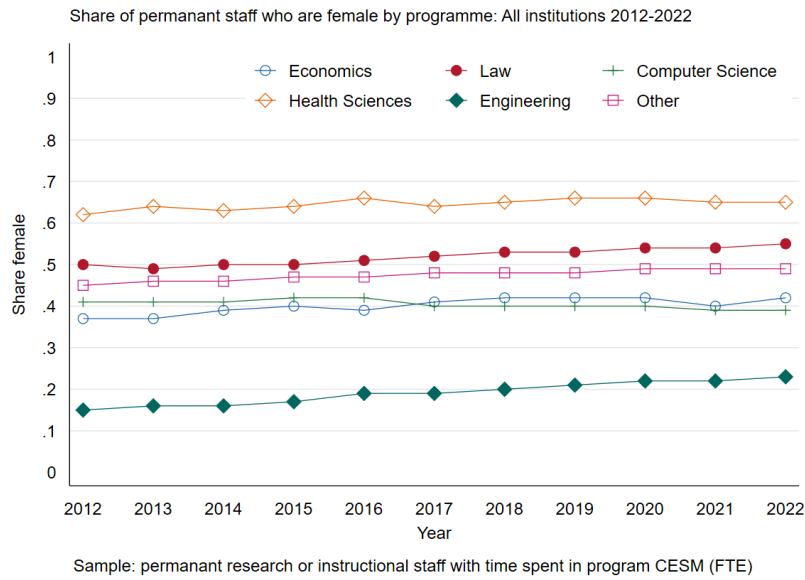


Figure 15: Share female staff in TUs and CUs by discipline (CESM), 2012-2022

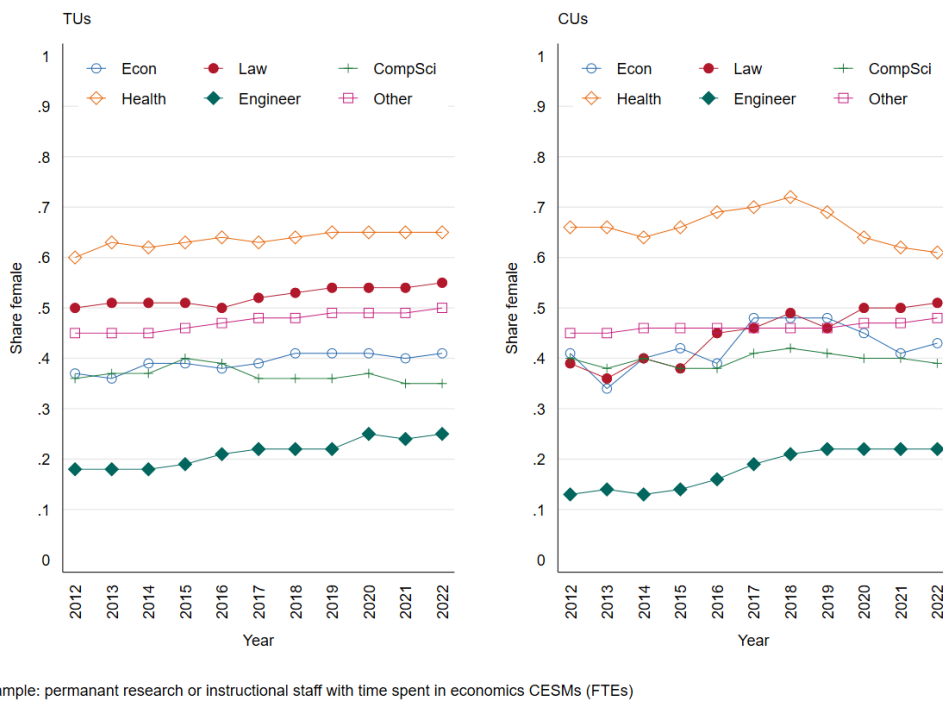
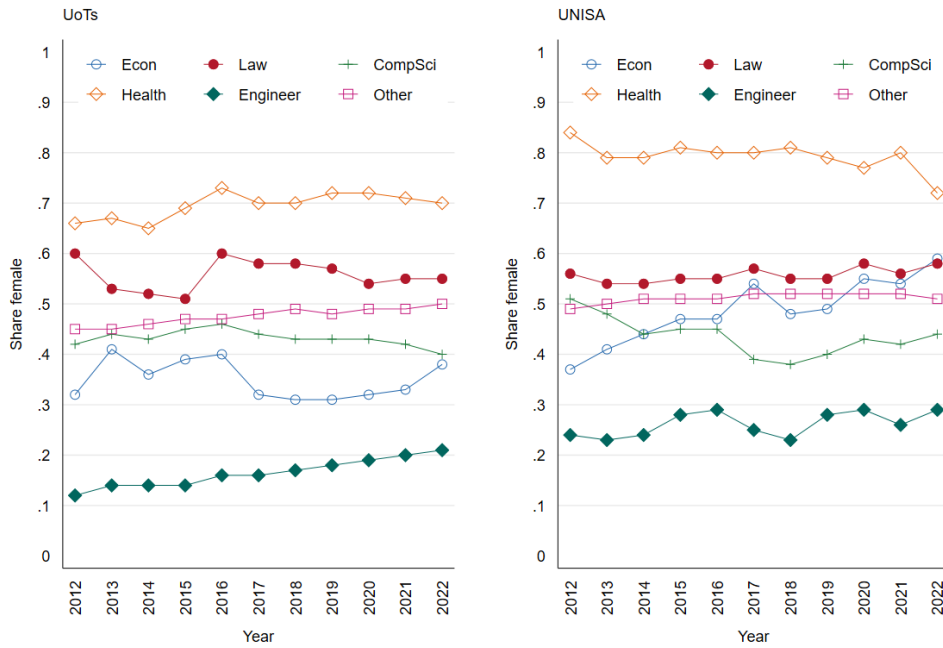


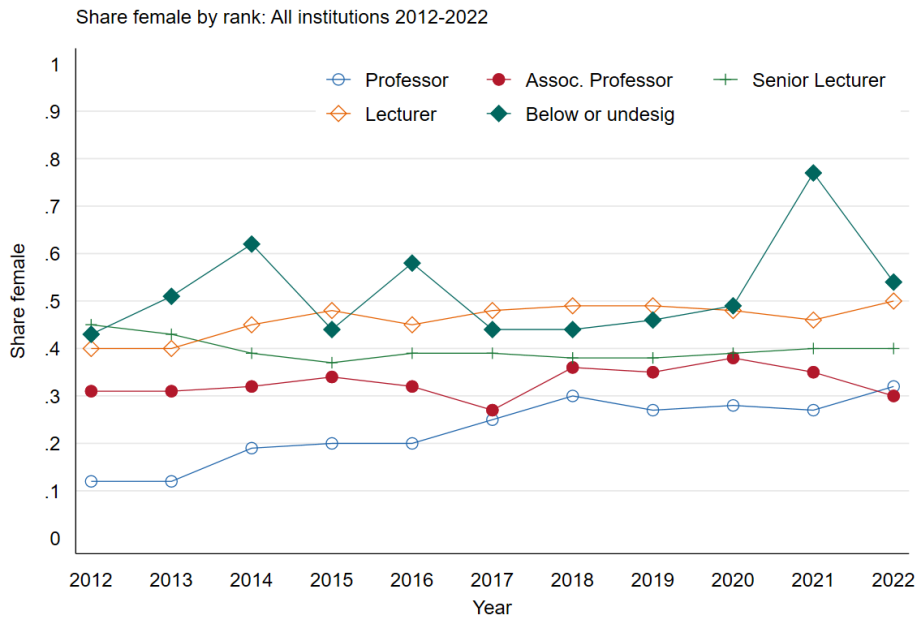
Figure 17 presents gender ratios across academic rank over time. There is a distinct ordering across rank, with lower ranked positions having a higher share of females. The professor trend shows the largest change over time, however, increasing from 11% in 2012 to 31% in 2022. Most of the growth is between 2012 and 2018. The share of females in lecturer positions has also increased and is the only staff rank that has reached gender parity by 2022 (besides the below and undesignated group, which fluctuates).

Figure 16: Share female staff in UoTs and UNISA by discipline (CESM), 2012-2022



Sample: permanent research or instructional staff with time spent in economics CESMs (FTEs)

Figure 17: Share female by staff rank, 2012-2022



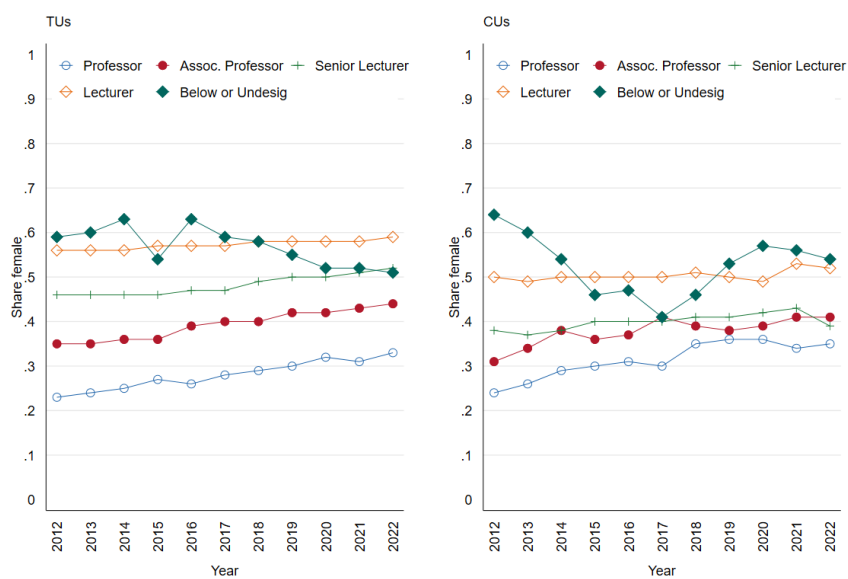
Sample: permanent research or instructional staff with time spent in program CESM (FTE)

Figures 18 and 19 present gender ratios by rank separately by institution type. TUs have the most distinct ordering across academic ranks, lower ranked positions having a higher share of female staff. All academic ranks have seen a similar rate of increase in the share of female staff over the analysis period such that the gap between ranks remains



consistent. The trends at CUs show more convergence in the share of females between ranks, but the share is lower than at TUs, at around 35 to 40% in 2022 for all but the lecturer and below groups. UNISA has also seen convergence across ranks over time. The share of females in senior lecturer positions is higher than the share in lecturer positions. Female professor representation is also highest at UNISA. Finally, UoTs have the lowest share of females at each level and have not shown much improvement over time. One exception is the group for junior lecturer and undesignated, which shows a large increase from 20% in 2012 to 45% in 2022.

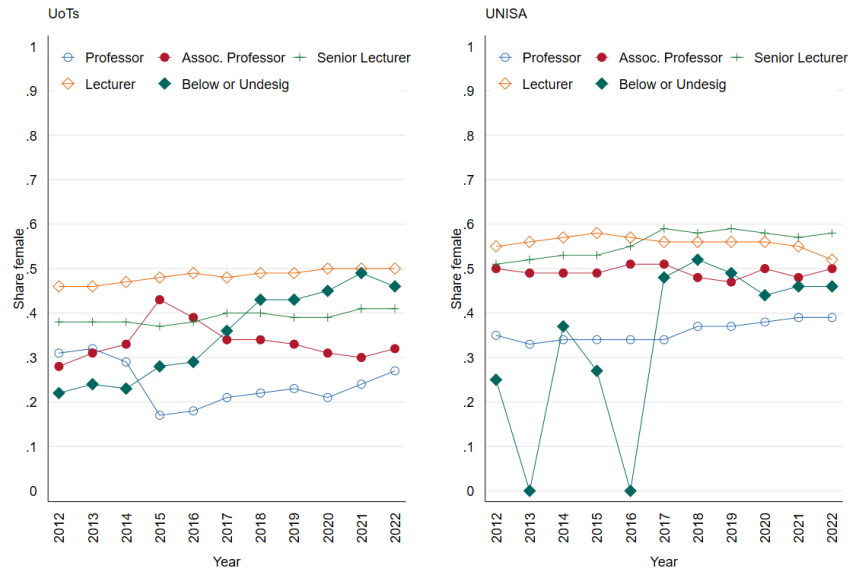
Figure 18: Share female by staff rank, TUs and CUs, 2012-2022



Sample: permanent research or instructional staff with time spent in economics CESMs (FTEs)

In summary, the overall share of female staff in economics has remained relatively stable, hovering around the 40% mark. This pattern is consistent across TUs and CUs, although there has been significant growth at UNISA, where the share of female staff increased from 37 to 60%. While gender parity remains lower at higher-ranked positions, there have been notable improvements in the rate of female professors over time. When disaggregated by institution type, upward trends are evident at all levels, with more convergence observed at CUs and UNISA compared to TUs and UoTs.

Figure 19: Share female by staff rank, UoTs and UNISA, 2012-2022



Sample: permanent research or instructional staff with time spent in economics CESMs (FTEs)

## 5.2 Profiling staff characteristics, by gender

Female staff are under-represented in economics, particularly in higher ranked academic positions. We therefore compare differences in male and female staff characteristics in an attempt to unpack the source of these differences.

Figure 20 plots the distribution of highest qualification categories of economics staff by year and gender. The share of staff with PhDs (doctoral qualifications) has been increasing over time at a similar rate for males and females, but from a lower base for females. This has been offset by a decline in the share with master's for males, and for master's and lower for females. By 2022, close to 60% of male economics staff held PhDs compared to just over 40% for females. The share with master's is 40% for females and 30% for males.

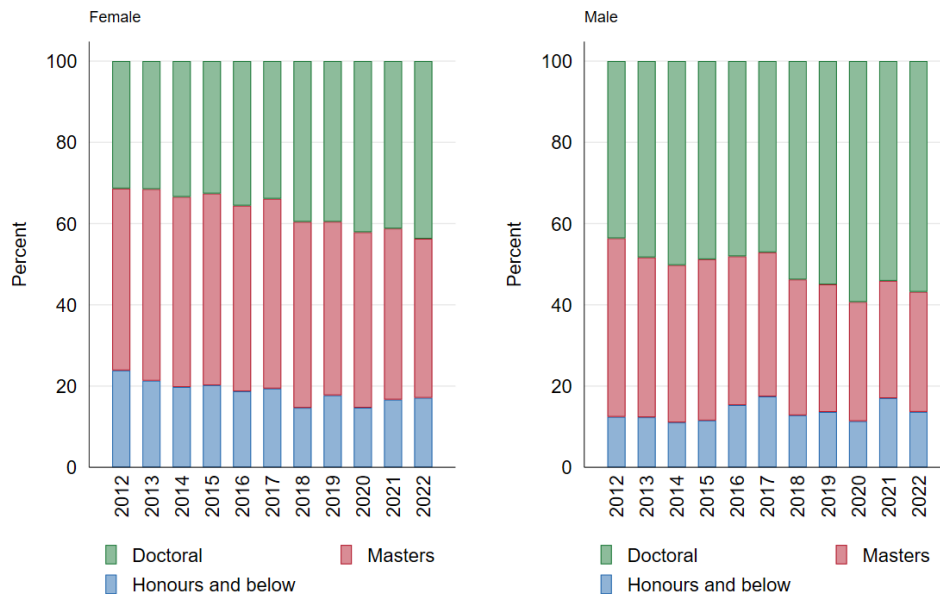
Figure 21 shows that female economics staff are younger than male in all years, with the share of staff under 40 being 10 percentage points higher for females than males. This is offset by a higher share in the 40-49 and 60+ group for males. The age distribution is stable over the period. Hence, it is not clear whether the difference in the distribution of qualifications is simply a function of female's younger age or reflect other factors.

Figure 22 plots the racial distribution by gender, and shows that the share of Black staff is slightly lower for females than males, with Coloured and Indian staff representing a larger share. The changes overtime are similar for male and female staff.

Figure 23 plots the number of economics staff FTEs by race and gender and shows that there has been substantial growth in the number of Black (broadly defined to include Coloured and Indian) female and male staff with limited growth in White female and male

Figure 20: Economics staff education distribution by gender, 2012-2022

Economics staff education distribution



Permanent staff FTEs in Economics related CESMS

Figure 21: Economics staff age distribution by gender, 2012-2022

Economics staff age distribution

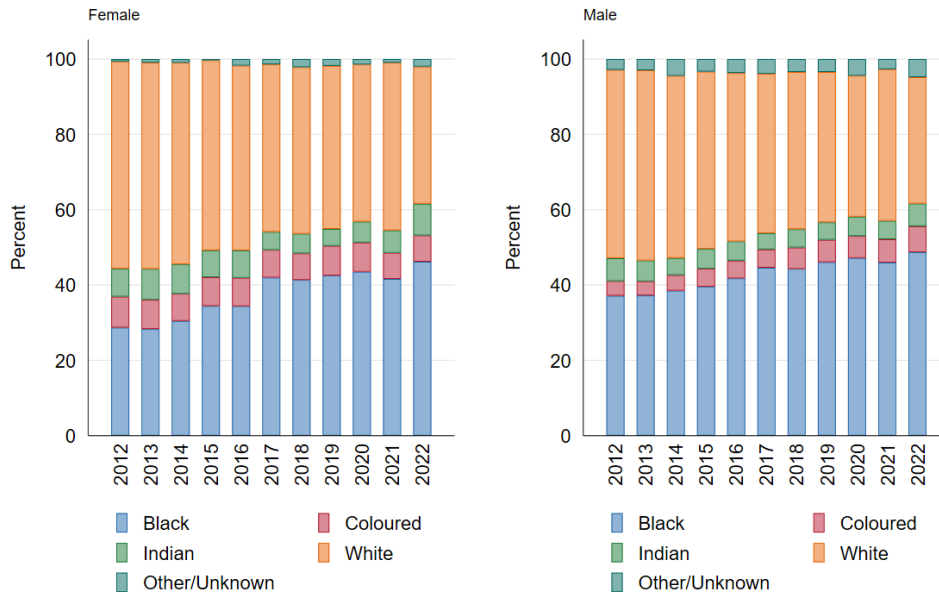


Permanent staff FTEs in Economics related CESMS

staff numbers, such that from 2020 onwards there are more Black male and female FTEs than White male FTEs in the system.

Figure 22: Economics staff racial distribution by gender, 2012-2022

Economics staff racial distribution



Permanent staff FTEs in Economics related CESMS

Figure 23: Number of economics FTEs by race and gender, 2012-2022

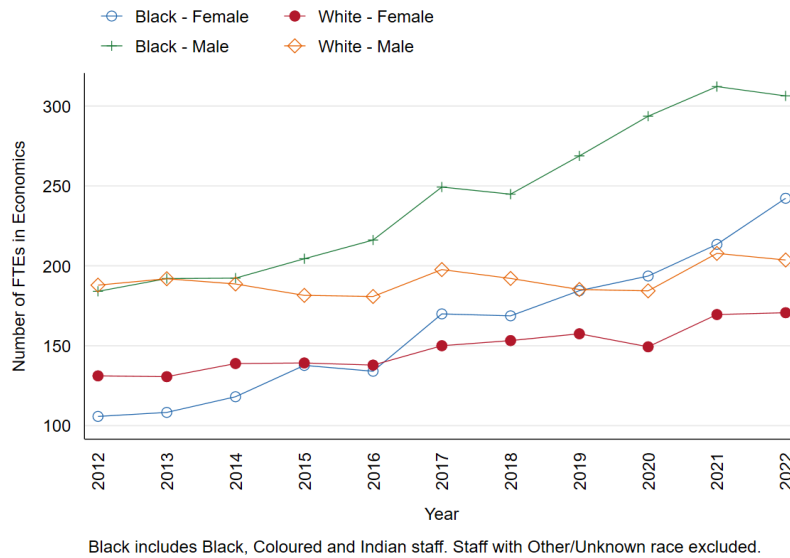


Figure 24 illustrates that the difference in educational attainment between male and female staff is partly a function of age. The share of females with PhDs is similar to males until the late 20s, at which point the female share drops below the male share for the same age categories. The gap widens further in the mid-thirties, possibly a function of women delaying PhD completion for childbearing. The gap narrows again in the late 30s early 40s, but remains persistent thereafter.

Figure 24: Share of economics staff with PhDs by age and gender

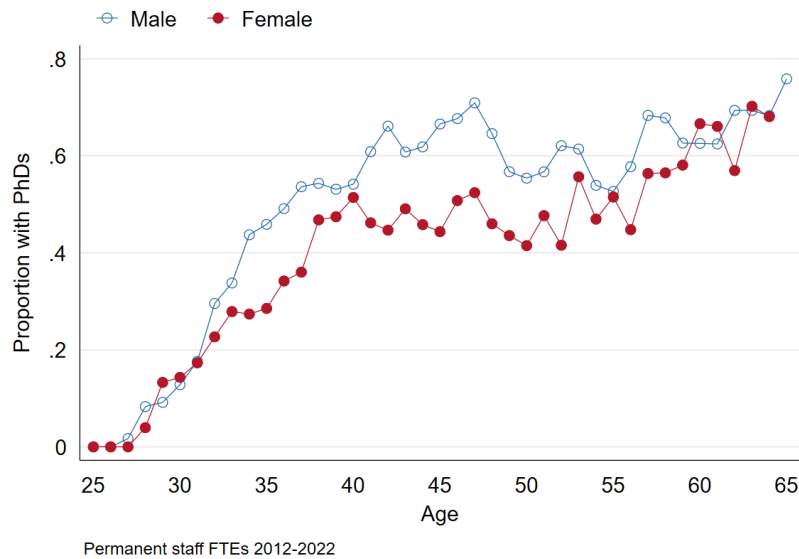


Figure 25 illustrates differential rates of PhD attainment between Black and White academics (Black broadly defined to include all other races groups) separately for females and males. Examining the White academics trend lines, for example, we see that the share with PhD is similar or higher for females until age 30, but the gap closes by age 32 and males overtake females until the 40s. The share of White females with PhDs remains fairly constant at 40% between the ages of 33 and 38, while the share for White males continues to grow, possibly a function of differential childcare responsibilities. White females ‘catch-up’ to males by 38, where the lines mostly overlap until age 45. The Black trend lines are lower than both White male and White female shares until age 40, and Black female academics have the lowest share of PhD holders throughout. The growth in the male-female gap in PhD attainment (emerging at age 30) also appears to align with childbearing choices. Finally, it is noticeable, that the gap between Black and White males is smaller than the gap between Black and White females until age 45, and the opposite is true thereafter.

Figure 26 plots the share of professors by age, sex and race. The ordering of the lines mimics that seen for PhDs in Figure 25. White males have the highest share, followed by White females, Black males and Black females. The share of White females who are professors overlaps with the share amongst White males for ages 40-44. The share of professors among Black males and Black females overlaps later, around the 48-54.

Figures 20 to 26 painted the aggregate picture for the South African system. Institutions in South Africa have a fair amount of autonomy in their human resource hiring and promotion decisions. In Tables 7 and 8, we therefore examine staff

Figure 25: Share of economics staff with PhDs by age, race and gender

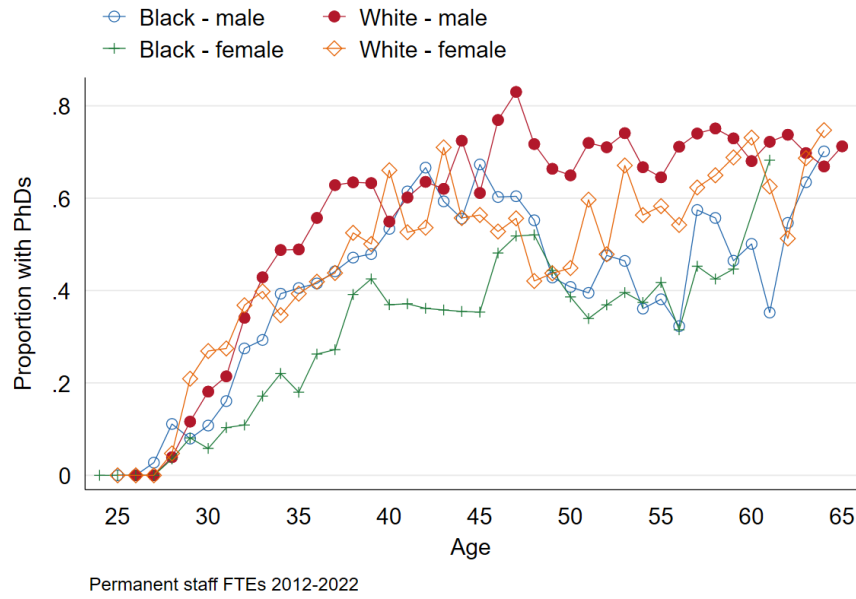
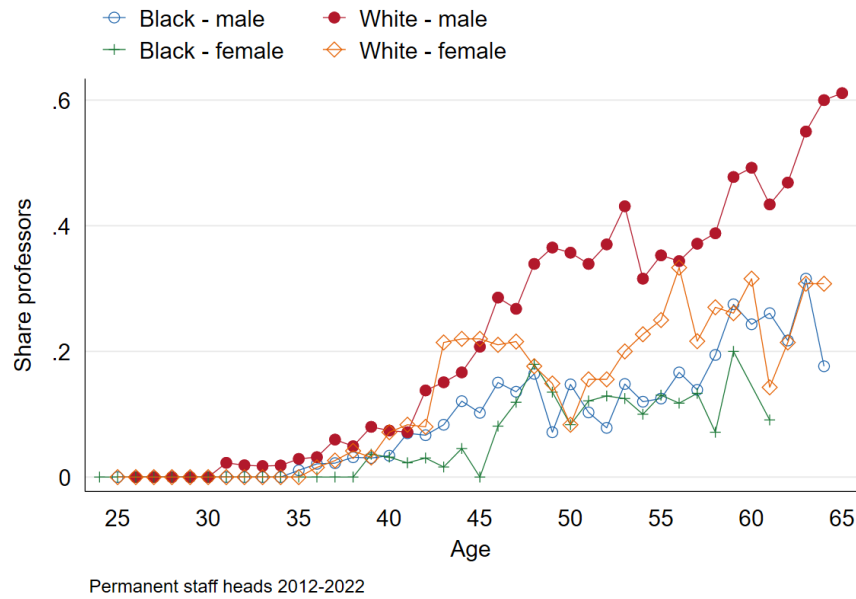


Figure 26: Share of economics staff that are professors by age and gender



characteristics separately for females and males by institution in 2022.<sup>18</sup>

One of the characteristics we explore is the historical (dis)advantage of the institution. This reflects apartheid legislation on the classification of institutions, whereby institutions designated to serve White South Africans received preferential treatment during apartheid, including in the share of state funding allocations. These are referred to as historically advantaged institutions (HAIs). Institutions designated to serve Black

<sup>18</sup>We present 2021 information for NWU as the 2022 data appears to be an outlier.

and Coloured students, referred to in the text as historically disadvantaged institutions (HDIs), were under-resourced and intentionally situated in peripheral and rural areas. The mergers of the 2000s, to which Luiz (2004, 2009) and Yu et al. (2017) allude, were an attempt by the post-apartheid government to reconfigure a fragmented and unequal system (DHET, 2013). Infrastructure and student body affluence continues, however, to be delineated across these historic lines.

Table 7 illustrates this historical legacy – the share of Black staff members remains lower at most HAIs with the share of Black staff at most HDIs the highest. The institutions that resulted from mergers fall in between, reflecting, in many cases, a combination of HDIs and HAIs. The racial composition is, however, similar for male and female staff within most institutions. HDIs appear to have younger staff members, on average, with female staff typically younger than their male counterparts. Average age differs less among male and female staff at HAIs and merged institutions. The share of staff with PhDs is highest in TUs, as would be expected given their research and PG student focus. The share of males with PhDs is equal or higher than for females in most institutions: this is the case at all CUs, UNISA, nine of 11 TUs and four of six UoTs.

Table 7: Permanent economics research and instructional staff by institution, 2022

Name	Inst.	Hist.	Black		Age		PhD		Masters		Honours		FTEs	
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
UCT	TU	HA	.46	.56	44	43.2	.42	.69	.47	.27	.11	.04	24	36
UFS	TU	HA	.32	.34	47.5	45.3	.81	.69	.19	.21	0	.05	18	29
UP	TU	HA	.47	.4	48.4	47.5	.93	.82	.07	.18	0	0	14	25
RU	TU	HA	.56	.59	43.5	45	.6	.63	.4	.37	0	0	7	9
US	TU	HA	.45	.3	40.4	44.7	.46	.74	.42	.18	.12	0	22	26
WITS	TU	HA	.58	.61	40.2	41	.4	.62	.4	.26	.09	.04	68	61
UFH	TU	HD	.82	.88	39.2	46.6	.16	.43	.51	.35	.33	.22	6	10
NWU	TU	HD	.37	.37	37	40.5	.35	.35	.41	.26	.2	.26	71	105
UWC	TU	HD	.78	.9	38.6	40.4	.34	.51	.62	.42	.05	.06	16	13
UKZN	TU	Merge	.57	.71	43.2	44.4	.45	.66	.42	.31	.07	0	23	38
UL	TU	Merge	1	1	48.9	37.6	.14	.34	.86	.46	0	.2	5	17
UV	CU	HD	1	1	39.9	48.5	.15	.4	.85	.28	0	.3	5	15
UZ	CU	HD	1	1	37.3	43.3	.05	.4	.95	.46	0	.14	5	8
UJ	CU	Merge	.8	.7	38.4	45.1	.43	.72	.39	.17	.12	.06	30	30
NMU	CU	Merge	.67	.9	41.9	42.6	.45	.77	.46	.18	.09	.04	14	14
WSU	CU	Merge	1	1	50.5	43.4	.04	.37	.22	.56	.5	.07	10	8
SPU	CU	New	1	1	31	49.1	.44	1	.56	0	0	0	2	5
UM	CU	New	.73	.7	37.3	37.9	.27	.61	.73	.39	0	0	7	12
CUT	UoTs	HA	0	.68	50.7	53.6	.91	.22	.09	.78	0	0	2	5
VUT	UoTs	HA	1	1	46.5	47.9	0	0	.72	1	0	0	3	3
MUT	UoTs	HD	1	1	32.6	40.9	0	.37	1	.63	0	0	2	5
CPUT	UoTs	Merge	.67	.68	42.2	47.7	.04	.25	.96	.68	0	0	5	8
DUT	UoTs	Merge	.64	.8	50.3	45	.74	.64	.26	.18	0	.18	3	14
TSUT	UoTs	Merge	.92	.86	47.9	50.3	.48	.57	.37	.34	.15	.09	7	9
UNISA	UNISA	HA	.59	.63	42.4	47.4	.49	.57	.37	.23	.13	.19	50	28

There are some exceptions: UL appears to be an outlier among TUs – female staff are older than male staff, on average, and it has the lowest share of female academics with PhD or professorships (but there are also very few economics staff members at UL in comparison to other institutions). UJ and NMU (and to a lesser extent UM) are also

anomalous to the other CUs and look more similar to the TUs in terms of race, age and educational attainment (both overall and in terms of gender differences).

Table 8 shows that the share of professors is higher for male staff members than female staff in 14 institutions of the 17 institution with professors<sup>19</sup>. The share of staff with a doctorate is an important signal of capacity to accept more PG intake, especially at the PhD level (Yu et al., 2017). Although this share has been growing, it remains below the (potentially unrealistic) National Development Plan target of 75% PhD qualified staff by 2030 in South Africa’s higher education sector.

Table 8: Permanent economics research and instructional staff by institution, 2022

Name	Inst.	Hist.	Prof		Assoc Prof		Senior Lec		Experience		South African		FTEs	
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
UCT	TU	HA	.21	.25	.15	.15	.15	.3	10.9	10.7	.82	.89	24	36
UFS	TU	HA	.16	.09	.22	.19	.18	.25	12.4	12.5	.87	.67	18	29
UP	TU	HA	.27	.38	.14	.2	.38	.21	12.1	14.4	.52	.63	14	25
RU	TU	HA	.11	.06	.16	.31	.16	.37	13.1	8.8	.84	.87	7	9
US	TU	HA	.17	.28	.03	.14	.39	.24	13.4	16.9	.89	.91	22	26
WITS	TU	HA	.06	.07	.06	.27	.45	.38	10.9	10.5	.88	.61	68	61
UFH	TU	HD	.16	.12	0	.23	0	.22	9	6.7	.84	.53	6	10
NWU	TU	HD	.08	.16	.17	.11	.46	.52	7.9	8.6	.99	.95	71	105
UWC	TU	HD	.02	.32	.18	.1	.23	.09	5.8	6.8	.89	.52	16	13
UKZN	TU	Merge	.01	.14	.14	.19	.43	.32	10.8	10.9	.82	.7	23	38
UL	TU	Merge	0	.12	.14	.07	.21	.33	12.8	8.4	.79	.93	5	17
UV	CU	HD	0	.02	0	0	0	.32	6	12	1	.78	5	15
UZ	CU	HD	0	.13	0	0	0	.28	7	7.9	.69	.86	5	8
UJ	CU	Merge	.14	.28	.1	.08	.17	.35	9.1	9.3	.65	.5	30	30
NMU	CU	Merge	.11	.19	0	.34	.1	0	9.3	6.8	.99	.57	14	14
WSU	CU	Merge	0	0	0	.21	.18	.17	13.9	7	1	.56	10	8
SPU	CU	New	0	.19	0	.69	.44	.04	5.1	2.3	.56	.96	2	5
UM	CU	New	0	0	0	.07	.12	.4	2.3	3	1	.69	7	12
CUT	UoTs	HA	0	0	0	0	0	.22	19.3	17.8	1	.89	2	5
VUT	UoTs	HA	0	0	0	0	0	0	14.1	10.3	.62	1	3	3
MUT	UoTs	HD	0	0	0	0	0	.29	2.2	9	1	.78	2	5
CPUT	UoTs	Merge	0	0	0	.09	0	0	11.5	9.9	.66	.84	5	8
DUT	UoTs	Merge	0	0	0	.13	.38	.41	23	9.9	1	.5	3	14
TSUT	UoTs	Merge	0	.17	0	0	.48	.4	12.1	11.4	.75	.57	7	9
UNISA	UNISA	HA	.12	.12	.2	.09	.29	.45	12	11.8	.86	.88	50	28

Table 9 presents average characteristics for female, male separately, and for all staff in 2012, 2017 and 2022. The table shows that the average age of female staff has increased for females from 39.7 in 2012 to 41.6 in 2022, while it has decreased from 45.1 to 43.6 for males over the same period. This has been associated with average years employed (our experience measure) increasing more for women than men, such that by 2022, females have 10.7 years versus 10.3 years for men compared to a 7.6 to 9.4 difference in 2012. The share of Black staff has increased by 11 percentage points for both females and males, offset by a decline in the share of White staff in both groups, and fairly stable shares within the other racial groups. There has also been a larger increase in the share of female staff with PhDs (29% to 45%) compared to the increase for male (43% to 57%). The

<sup>19</sup>Only one UoT, TSUT, has staff members at professor level. WSU and UM also have no staff classified as professors.



share of females that are professors has increased from 4% to 10% over the period. Males, on the other hand, have experienced a decline in their share of professorships. However, even after this reduction, their share remains 50% higher than that of females, standing at 15% in 2022. We explore this in further detail in Section 5.3. The second row from the bottom shows that most professors have PhD qualifications, as would be expected.

Table 9: Economics staff characteristics: 2012, 2017, 2022

	All staff			Female staff			Male staff		
	2012	2017	2022	2012	2017	2022	2012	2017	2022
Share female	.38	.41	.44	1	1	1	0	0	0
Age	43	42.88	42.75	39.69	40.8	41.62	45.07	44.34	43.65
Experience (years)	8.72	9.76	10.45	7.57	9.16	10.67	9.44	10.18	10.28
Share South African	.8	.82	.82	.87	.87	.88	.75	.79	.78
Race									
Black	.33	.39	.43	.29	.35	.4	.35	.41	.46
Coloured	.05	.07	.06	.07	.07	.07	.04	.06	.05
Indian	.08	.06	.07	.08	.07	.08	.09	.05	.05
White	.52	.46	.41	.56	.49	.43	.49	.43	.39
Other/Don't know	.02	.04	.03	.01	.02	.01	.03	.04	.04
Qualification									
Doctoral	.38	.44	.52	.29	.38	.45	.43	.48	.57
Master's	.4	.37	.33	.4	.41	.41	.41	.35	.28
Honours	.12	.12	.1	.19	.15	.1	.08	.1	.1
<Honours	.06	.06	.04	.1	.05	.04	.04	.06	.05
Missing	.03	.01	.01	.03	0	0	.04	.01	.01
Rank									
Prof	.13	.13	.13	.04	.08	.1	.18	.16	.15
A.Prof	.11	.12	.14	.09	.09	.12	.12	.14	.16
S.Lecturer	.29	.26	.32	.33	.28	.31	.26	.24	.33
Lecturer	.45	.48	.4	.51	.53	.47	.42	.45	.35
Other/Don't know	.03	.02	.01	.03	.02	.01	.02	.01	.01
Prof has PhD	.9	.92	.95	1	.88	.95	.88	.93	.95
Number of staff	621	795	952	239	328	419	382	467	533

### 5.3 Decomposing the gender professorship gap

There are multiple factors at play that could be impacting differences in the rate of professorship between male and female economics staff. Furthermore, as evidenced in the literature, individual characteristics may be rewarded differently for males and females within the economics profession due to gender inequities. To quantify the share of the gender professorship gap that can be attributed to differences in measurable, performance-related characteristics versus an unexplained component, we apply the Oaxaca Blinder decomposition method (Blinder, 1973; Oaxaca, 1973). This is a counterfactual technique that decomposes the professorship gap into an explained and unexplained component. The ‘explained gap’ is the difference due to observable characteristics between male and female staff that relate to performance as a professor (e.g. qualification, experience etc.), whereas the ‘unexplained gap’ is the residual due to differences in the reward to these characteristics (in terms of obtaining professorship) depending on whether an individual is male or female. It therefore includes potential forms of discrimination.

The top panel of Table 10 shows the gap in professorship in economics between males and females over the analysis period, together with the share of the gap that can be attributed to differences in characteristics included in the model (age, age<sup>2</sup>).<sup>20</sup> The gap drops from 13.6 points in 2012 to 4.7 points in 2022. The share of the gap explained by covariates ranges between 38.3% and 70.7%, fluctuating over time, with no particular trend apparent.

Table 10: The gender gap in professorship explained vs. unexplained: 2012-2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Male	.178	.175	.178	.145	.145	.161	.144	.155	.158	.151	.145
Female	.042	.046	.062	.058	.061	.079	.085	.077	.083	.083	.098
Gap	.136	.129	.116	.088	.084	.081	.06	.078	.075	.068	.047
Explained	.063	.061	.06	.034	.039	.048	.042	.041	.037	.03	.022
Unexplained	.073	.068	.056	.054	.045	.033	.017	.037	.038	.038	.025
% of gap explained	46.4	47.2	51.8	38.3	46	59	70.7	52.4	49.1	43.9	47
Male - Black	.098	.09	.09	.072	.08	.098	.076	.065	.073	.075	.069
Female - Black	.019	.029	.026	.023	.031	.044	.031	.034	.054	.048	.049
Gap	.079	.061	.065	.049	.049	.054	.045	.03	.019	.028	.02
Explained	.021	.02	.022	.011	.014	.022	.018	.017	.021	.023	.021
Unexplained	.057	.041	.042	.038	.035	.032	.026	.013	-.002	.004	-.001
% of gap explained	27.2	32.4	34.3	22.7	29.1	40.6	41.4	56	110.7	83.8	105.1
Male - White	.261	.262	.269	.215	.222	.238	.231	.276	.266	.256	.264
Female - White	.06	.059	.085	.088	.077	.112	.137	.119	.12	.126	.175
Gap	.2	.202	.184	.127	.145	.125	.095	.157	.145	.129	.089
Explained	.106	.105	.101	.055	.065	.079	.068	.071	.055	.029	.008
Unexplained	.095	.097	.083	.072	.08	.046	.026	.086	.091	.1	.08
% of gap explained	52.7	52.1	54.8	43.3	45	63.3	72.1	45.3	37.7	22.8	9.3
Male - White	.261	.262	.269	.215	.222	.238	.231	.276	.266	.256	.264
Black (Male & Female) + White Female	.067	.065	.072	.064	.066	.087	.08	.071	.079	.08	.086
Gap	.194	.196	.198	.151	.156	.151	.151	.205	.186	.176	.178
Explained	.088	.082	.086	.055	.07	.083	.064	.061	.061	.043	.041
Unexplained	.106	.114	.112	.096	.085	.068	.087	.144	.125	.133	.137
% of gap explained	45.5	42	43.3	36.5	45.2	55.1	42.3	29.7	33	24.4	23

The second and third panels assess the gender gap within race groups. The share of Black male professors decreases from 9.8% in 2012 to 6.9% in 2022 (this against the large growth in Black staff evident in Figure 23), while the share of Black female professors grows from 1.9% to 4.9%. As a result, the Black gender gap decreases from 7.9 points to 2 points over the period. The percentage of the gap explained is initially low, but increases from 2015 onwards, such that by 2020 it is more than 100% explained by age. This signals that if males had the age distribution of females they would have a higher share of professors i.e. females have an age profile more strongly aligned with professorship than males.

The pattern is very different within the White group. Around a quarter of White males are professors in each year, while the share of White females who are professors increases from 6% to 17.5% over the period. As a result of the increasing share of female professors, the gender gap decreases from 20 points in 2012 to 8.9 points in 2022. The

<sup>20</sup>In Appendix Table A2, we present comparable estimates from a model controlling for age, age<sup>2</sup>, years at institution, and institution type. The inclusion of institution type substantively improves the share of the gap explained.

trend in the percentage of the gender gap explained by age is also interesting; it decreases (with some fluctuations) from 52.7% in 2012 to 9.3% in 2022. Thus differences in the age distribution between White males and females explain less of the gap in professorship in economics over time.

Differences between race groups are the largest. In 2022, for example, the share of professors in the White female group is more than double the share within the Black male group and more than three times the share in the Black female group. Given the focus on gender in this report, in the last panel, we assess the gap in professorship between White males and other groups (i.e. White females and Black males and females). The gap has remained large throughout, 19.4 points in 2012 and 17.8 in 2022. Furthermore, the share of the gap explained by age, while initially oscillating between 36% to a high of 55% 2017, has subsequently declined to 23% in 2022. This illustrates that a substantial portion of the gender professorship gap is due to unexplained factors, suggesting White males retain privileges over female and Black academics of similar ages.

## 5.4 Section summary

This section analysed economics staff in South African public universities focusing on FTE permanent research and teaching staff. Between 2012 and 2022, the number of male economics staff increased by 40%, while the female staff complement grew by 75%, reaching a female representation of 42% in 2022. Trends across different disciplines and institution types reveal that the share of female staff in economics remains lower than in fields like health sciences and law and is more similar to computer and information sciences. TUs and CUs exhibit similar gender trends, whereas UNISA shows significant growth in female staff representation, rising from 37% to nearly 59%.

Gender disparities are more pronounced at higher academic ranks, although there has been notable progress, particularly in the increase of female professors from 11% to 31%. Younger female staff and those with lower ranks are more prevalent, and women still lag in attaining PhDs compared to their male counterparts, possibly due to age-related factors and potential childcare responsibilities. The racial distribution of staff shows similar trends for both genders, with a significant growth in Black staff members. HDIs tend to have younger and more racially diverse staff, yet still face challenges in gender equity at higher academic ranks. Finally, the Oaxaca Blinder decomposition illustrates that a substantial portion of the gender professorship gap is due to unexplained factors, suggesting possible discrimination in the reward system for female and Black academics.

## 6 Results: Research in economics

Having examined trends in the composition and characteristics of academic staff by gender, we now turn to research outputs in economics, focusing on differences in productivity and collaboration by gender. This section leverages two comprehensive databases — SAKnowledgebase (from CREST) and Scopus — to analyse trends in publication volume, authorship, and citation impact. By combining information based on departmental affiliations, as implemented by SAK, with field-level data from Scopus, we provide two complementary perspectives on how research contributions differ by gender within the South African economics community.

### 6.1 SAKnowledgebase data

Figure 27 presents the number of contributing authors and publications from staff in economics departments in public South African universities by gender over time. The data was provided by CREST and thus the aggregate numbers replicate those in their report. The number of authors increases from 311 in 2012 to a high of 833 in 2019, before declining to 627 in 2020. The number of contributing female authors oscillated between 99 and 141 between 2012 and 2017, increased to 201 in 2018, 259 in 2019 and declined in 2020 to 192. This has represented around a third of contributing authors throughout the period. A relatively large number of authors have unknown gender in 2012-2017, while all authors are classified as male or female in 2018-2020. As such, we include the unknown group in the tables and figures presented.

Figure 27: Number of authors and publications in economics by gender, 2012-2022

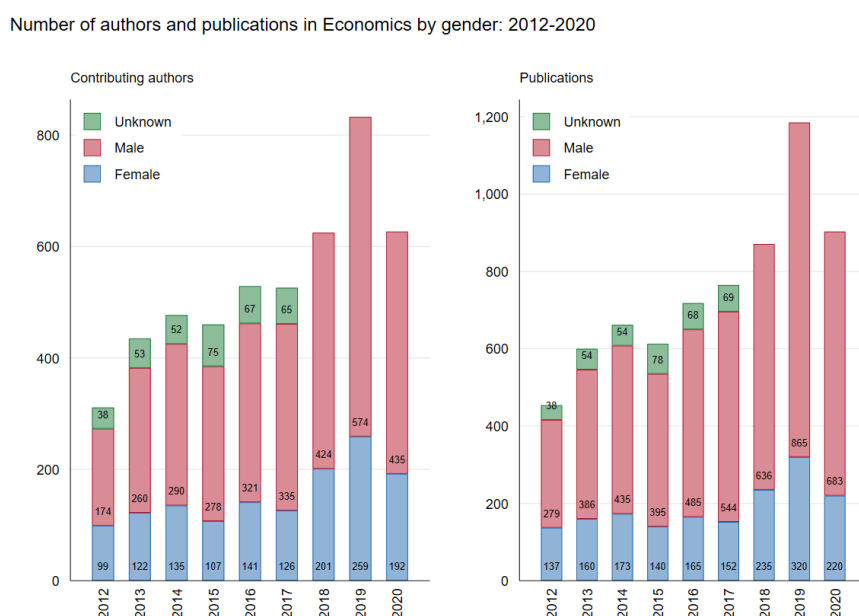


Table 11 presents demographic characteristics of contributing authors in 2012, 2017 and 2020, overall, for females only and for males only. The racial composition of female authors has changed rapidly over the analysis period. In 2012, only 24% of female authors were Black, Coloured or Indian. In 2020, the comparable share is 44%, with the share of Black authors increasing from 10% to 34%. Racial transformation among male authors has been less remarkable, although the racial composition of males was more transformed already in 2012 where 37% of authors were Black, Coloured or Indian. By 2020, the male racial composition was 46% Black, 1% Coloured, 4% Indian, 35% White and 14% non-SA or other/unknown.

Table 11: Economics authors' characteristics: 2012-2020

	All authors			Female authors			Male authors		
	2012	2017	2020	2012	2017	2020	2012	2017	2020
Share female	.36	.27	.31	1	1	1	0	0	0
Race									
Black	.2	.34	.43	.1	.24	.34	.29	.43	.46
Coloured	.02	.01	.01	.04	.01	.02	.01	.01	.01
Indian	.07	.05	.05	.1	.06	.08	.07	.05	.04
White	.56	.4	.39	.71	.57	.48	.6	.41	.35
Other/Unknown	.15	.21	.01	.05	.12	.01	.03	.1	.01
Non-South African	0	0	.11	0	0	.06	0	0	.13
Age									
<30	.03	.02	.1	.04	.01	.16	.03	.02	.08
30–39	.17	.16	.33	.21	.23	.38	.18	.16	.31
40–49	.18	.18	.28	.16	.21	.28	.22	.21	.28
50–59	.15	.14	.18	.12	.1	.11	.2	.19	.21
60+	.05	.07	.1	.01	.02	.07	.09	.1	.11
Unknown age	.43	.43	.01	.45	.43	0	.29	.32	.01
Number of authors	311	526	627	99	126	192	174	335	435
Number of Staff FTEs (based on CESM)	621	795	847	239	328	348	382	467	499

It is difficult to examine the trend in age composition over time, because more than 40% of female authors and 30% of male authors do not have age information in 2012 and 2017. If we assume that authors with missing ages in 2012 and 2017 are proportionately allocated across age groups, we see that both female and male authors have become proportionately younger over the period, with 16% of female authors in the under 30 group in 2020 compared to only 7% in 2012. The trend is less marked for males, increasing from 4% to 8% over the period. Given that SAK includes all subsidy-earning publications affiliated with staff in economics departments, the increase in the younger age group likely reflects growth in student-supervisor coauthored publications.

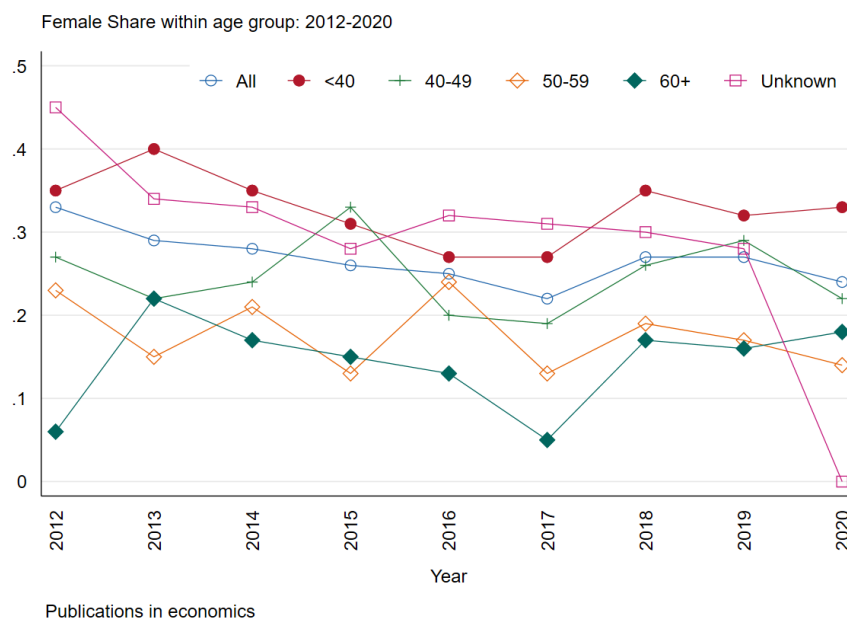
Mouton et al. (2023) note the ‘substantial increase in the number of articles (full paper count) published over this period [...] and that the ‘productive human resources capacity’ that authored these papers, increased at a higher rate than the number of articles.’ Figure 27 allows us to examine this separately for males and females. Ninety-nine female authors produced 137 publications in 2012, i.e. 1.4 publications per author on average. This changed to 192 authors producing 220 publications in 2020, representing an average of 1.2 publications per female author. For males, this measure remained more stable: 1.6

in 2012 and 1.57 in 2020. Thus Mouton et al.’s (2023) observation of reduced human resource capacity was driven predominantly by a reduction in publication capacity for female authors.

Mouton et al. (2023) notes that, “The most likely explanation for this can be found in the increasing contribution that post-graduate students and postdoctoral fellows are making to knowledge production in most academic fields at SA universities.” If this is indeed the driver, this would signal that female authors are either supervising more PG students or post-doctoral fellows, or that female authors are more likely to collaborate with earlier career authors. We cannot, unfortunately, unpack this with the data that we received.

Figure 28 presents the female share of authorship within age group for economics publications over the period 2012-2020. Overall the share decreases from a high of 33% in 2012 to a low of 23% in 2017, before increasing to 28% in 2018 and 2019 and decreasing again in 2020 to 25%. Examining the different age groups, and excluding the unknown group, in most years, the share of females is higher in younger age groups. Year 2017 provides the most extreme case of this, where only about 5% of publications from the 60+ age group are authored by females, 15% for 50-59, 20% for 40-49 and 28% for those under 40.

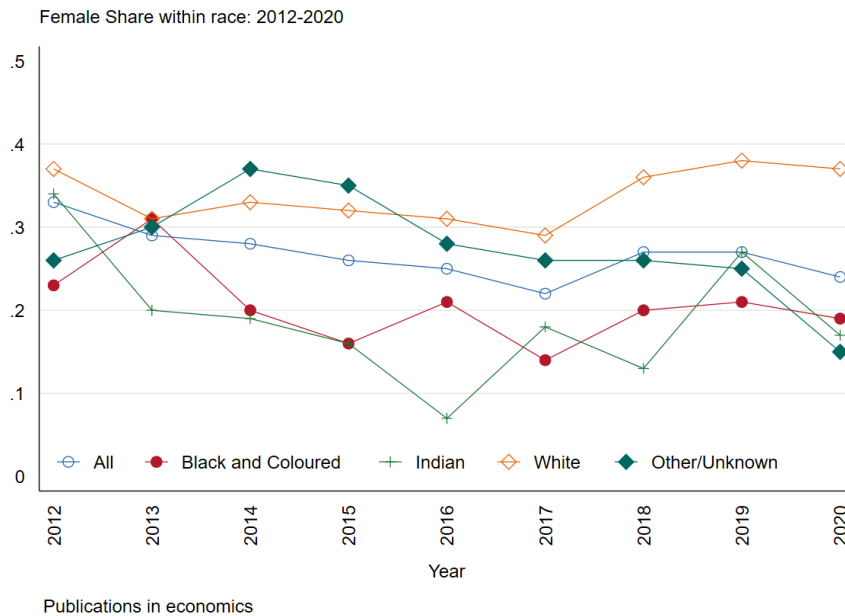
Figure 28: Female share of authorships within age group, 2012-2020



Next we look at differences by race group (Figure 29), with publications from Coloured authors grouped with Black authors due to small sample sizes. In general, the female authorship share is similar for the Black and Indian groups over time. The share dips between 2012 and 2015, but remains around 20% thereafter. The female share is much

higher among publications produced by White authors and has increased to close to 40% in the last three years of the data.

Figure 29: Female share of authorships within race: 2012-2020



Lastly, we compare the number of authors defined by department in SAK, versus the number of staff FTEs in economics CESMs in HEMIS. Although the measures are not based on a comparable definition of staff in economics, each is measured in the same way over time and therefore the ratio of the two measures – one representing staff with research productivity and the other representing staff quantity – presents a useful measure of productivity per staff capacity, for comparison between males and females. For females, the ratio of publications to FTE staff increased from 41% (47% if authors with unknown gender are allocated proportionately to the female and male group) in 2012 to 55% in 2020. On the other hand, this same ratio increased from 46% (52%) to 87% over the same period for males. Thus, a 14 percentage point increase for females versus a 41 percentage point increase for males. This suggests that while “productivity” in terms of authorship per FTE was similar in 2012 for males and females, males have seen higher growth in this measure over the period.

## 6.2 Scopus data

Table 12 shows that the number of articles published in the field of economics, econometrics and finance has grown considerably over time, from 272 in 2012 to 982 in 2022. The number of authors affiliated with South African institutions has similarly

grown, almost quadrupling over the decade (368 to 1 240).<sup>21</sup> The share of female authors, however, has remained relatively stable over the period, echoing findings in Mouton et al. (2023). The number of articles with at least one female (co)author has grown at a similar rate to the number of female authors, indicating similar patterns of collaboration in terms of gender representation for females over time.

Table 12: Descriptive statistics on economics articles and authors: 2012-2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Articles</b>											
Number of articles	272	504	1686	475	529	559	684	709	867	873	982
No. articles with female (co)authors	80	136	461	134	162	126	173	195	238	258	279
<b>Authors</b>											
Number of (unique) authors	368	567	1561	597	730	678	857	930	1069	1147	1240
No. of male authors	147	214	497	266	296	281	363	364	430	458	467
No. of female authors	89	123	355	122	173	145	180	210	236	256	287
No. of undetermined authors	132	230	709	209	261	252	314	356	403	433	486
<b>Gender shares</b>											
Male	.4	.38	.32	.45	.41	.41	.42	.39	.4	.4	.38
Female	.24	.22	.23	.2	.24	.21	.21	.23	.22	.22	.23
Undetermined	.36	.41	.45	.35	.36	.37	.37	.38	.38	.38	.39
<b>Undetermined group</b>											
Average probability of likely gender	.73	.72	.71	.72	.72	.72	.72	.73	.74	.73	.72
Average share likely female	.30	.33	.33	.33	.32	.31	.33	.33	.37	.35	.37

Note: Number of articles with female representation reflects females with a South African affiliation only, and for whom the probability of likely gender being female is greater than 0.91.

The third panel of Table 12 shows that share of undetermined authors classified as ‘likely to be female’ has oscillated over time. Importantly, it does not show any concerning fluctuations that might indicate we are classifying authors differently over time.

In the following figures, we break down three metrics by gender classification (male, female, undetermined) and year. These are: the average number of publications per author in a year (Figure 30), the average number of citations per author in a year (Figure 31) and the average number of coauthors per author in a year (Figure 32).

On average, male authors consistently publish more articles per year, but only marginally so (Figure 30) – 1.68 versus 1.39 in 2022, for example. Higher publication counts among male authors aligns with the higher number of citations that men receive on average (left hand panel of Figure 31). Once the number of publications are taken into account, however, there is no clear pattern that emerges with respect to the number of citations that male versus female authors are receiving per article. Note that the lower number of citations for both male and female authors in later years reflects the shorter time period over which to accumulate citations (average number of citations are as at 29 November 2024).

It is positive that conditional on the number of publications, the quality of female authors’ publications (as measured by number of citations) is on par with that of male

<sup>21</sup>Note that the lower number of authors than publications in 2014 would arise as a result of multiple articles per author.



authors. However, it is clear that progress has not been made in increasing the share of female authors and the average number of publications by female authors is still below that of their male counterparts.

Figure 30: Average number of articles per author by gender, 2012-2022

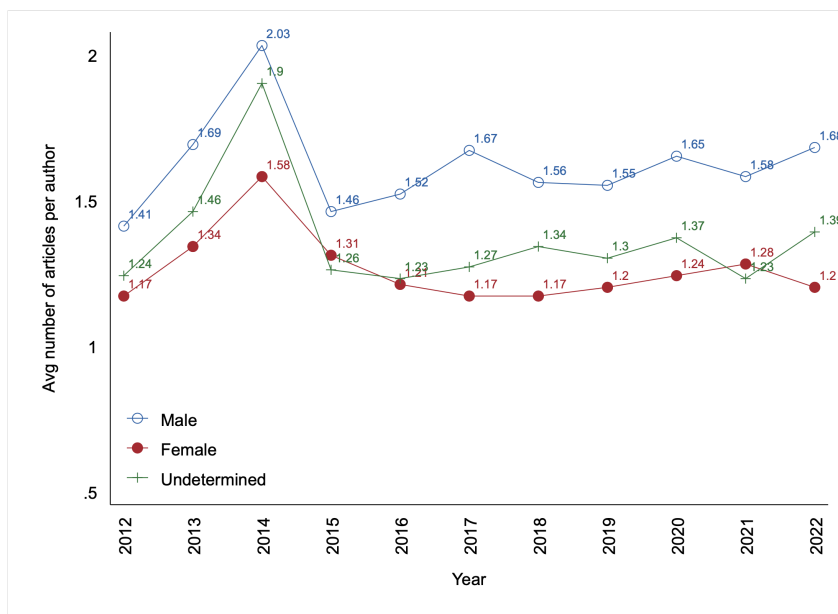
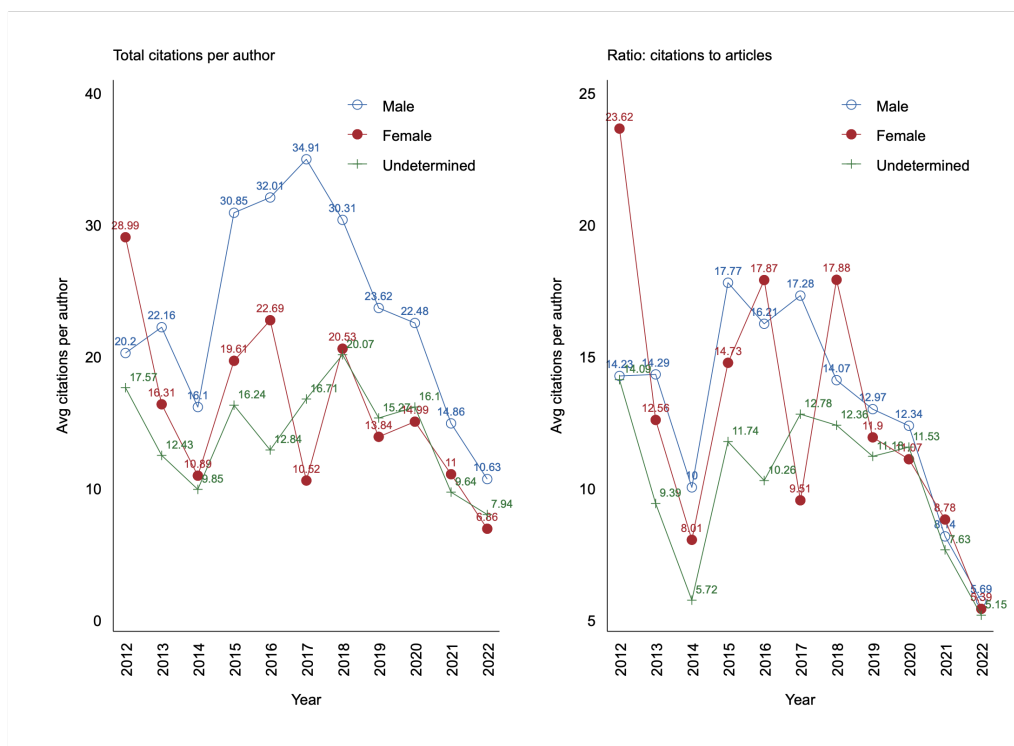


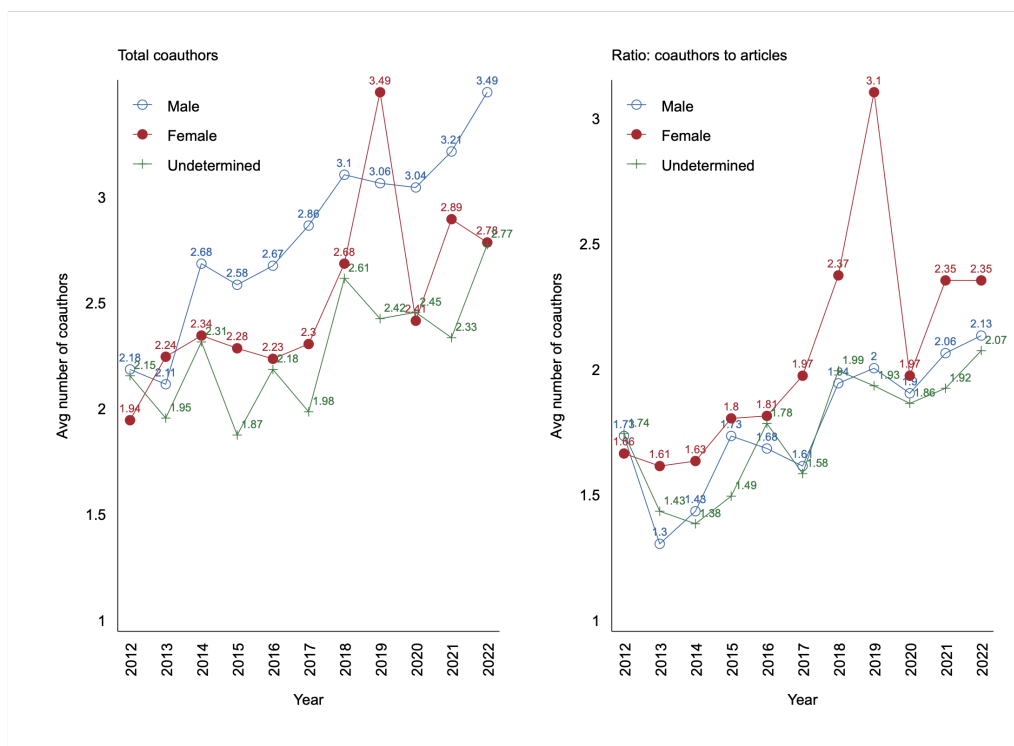
Figure 31: Citations by gender, 2012-2022



Note: In the right hand panel, average number of citations per author is computed as the ratio of total number of citations an author received in a year by total number of articles published per year. Citations as at November 2024.

Individual research productivity can grow as a result of increasing the number of articles produced at constant levels of collaboration, or through increasing the number of collaborations. The left hand panel of Figure 32 shows that, on average, male authors have a greater number of coauthors than females and this has been increasing over time. However, the ratio of coauthors to publications in the right-hand panel, suggests that per publication, female authors have a higher number of coauthors.

Figure 32: Co-authorships by gender, 2012-2022



Note: In the right hand panel, average number of coauthors is computed by dividing total number of coauthors who an author publishes with in a year by total number of articles published per year.

## 7 Conclusion

The use of nationally collected data in this study provides a robust and comprehensive approach to monitoring the economics profession in South Africa. It facilitates the identification of gaps in data coverage and quality, while establishing a sustainable method for ongoing monitoring. By leveraging existing data sources, we gain valuable insights into the representation and progress of women in the field and inform evidence-based policies and interventions to promote gender equality in economics.

Existing work on academic economics in SA was limited in the extent to which it considered the intersecting inequalities between gender and other factors e.g. race, institution types (and therefore potentially the types of skills acquired). We fill this gap by offering insights into gender imbalances in the economics discipline across all academic

tiers in the public higher education system in South Africa, and how gendered barriers and biases intersect with some of these other inequalities.

Diverse manifestations of gender disparities emerge across different tiers, sectors, and subfields within institutions. These variations often stem from a complex interplay of factors, including institutional activities, economic priorities, historical classifications, cultural norms, and racial dynamics. Our analysis takes these distinctions into account, aiming to highlight and elucidate these nuances wherever feasible. We foreground the following five key findings:

1. Women dominate enrolment in economics at the undergraduate, honours and master's levels, but this has not, to date, fed through to enrolment and graduation at a PhD level. Things do, however, appear to be changing fairly rapidly and trends suggest that women may be on track to reach parity in PhD enrolment and graduation in the near future.
2. Female staff, on the other hand, remain under-represented in economics and there has been limited change over the period, especially given the positive growth in female economics graduates. Female staff also tend to be younger and in lower ranked positions, on average.
3. The overall gap in share of male versus female professorships has declined over time, and is increasingly explained by covariates we can observe in our data. This feels like a positive shift.
4. Disaggregating the gap by race, however, suggests that there are persistent inequalities within the system. For example, while there has been a decline in the share of White males in the system, those remaining are retaining their professorship advantage. A substantial portion of the gender professorship gap is due to unexplained factors, suggesting White males retain privileges over female and Black academics of similar ages.
5. The share of female authors has remained fairly stable over the period (in the two datasets that we use), suggesting that the improved representation of women among economics staff has not translated into a corresponding increase in publication outputs. This may indicate differences in research productivity or that women face disproportionately higher teaching or administrative burdens, limiting their time for research.

Ultimately, there has been notable progress in addressing gender imbalances among economics students and staff, but disparities remain, particularly at the doctoral and professorial levels and in research output. Therefore, there remains significant potential to further advance women in economics in South Africa.

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# Appendix A

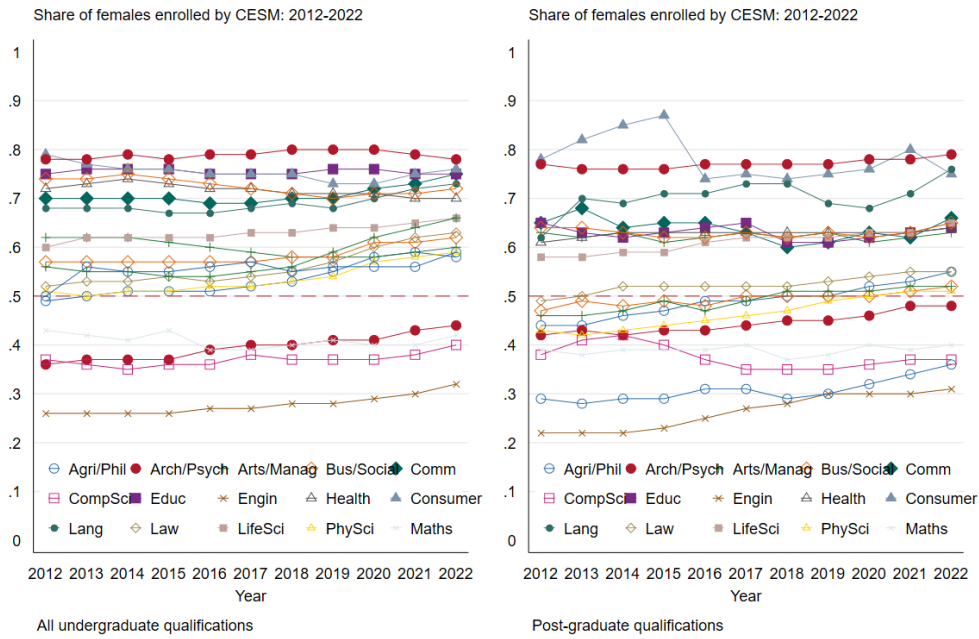
## A.1 Additional figures and tables

Table A1: Summary of South African literature on women in higher education

Author(s)	Title	Date	Outcome	Field	Sample	Methods
Akala	Challenging gender equality in South African transformation policies - a case of the White Paper: A programme for the transformation of higher education	2018	Gender equality in HE		Black women in HE	Perspective
Herman	Elusive equity in doctoral education in South Africa	2011	Doctoral participation		PhD students	Qual and quant
Idahosa and Mkhize	Intersectional Experiences of Black South African Female Doctoral Students in STEM: Participation, Success and Retention	2021	Experiences	STEM	Women PhD students	Qual
Magano	Narratives on challenges of female black postgraduate students	2011	Challenges		Black female PhD students	Qual
Magoqwana et al.	“Forced to Care” at the Neoliberal University: Invisible Labour as Academic Labour Performed by Black Women Academics in the South African University	2019	Biographical experiences		Black women academics	Personal narratives
Mahabeer et al.	Academics of colour: Experiences of emerging Black women academics in Curriculum Studies at a university in South Africa	2018	Experiences	Curriculum Studies	Black women academics	Personal narratives
Managa	Juggling work and life: experiences of women in academic and research institutions in South Africa	2013	Experiences		Women PhD students, academics	Qual and quant
Mkhize	Is it transformation or reform? The lived experiences of African women doctoral students in STEM disciplines in South African universities	2023	Experiences	STEM	African women PhD students	Qual
Mlambo and Mabokela	‘It’s more flexible’: persistence of women engineers in the academy	2017	Persistence	Engineering	Women academics in an HEI	Qual
Muberekwa and Nkomo	Exploring the Perceptions of Wits Academic Women About Women Empowerment and the Changing Roles of Women in 21st-Century South Africa	2016	Perceptions		Women academics in a HEI	Qual
Obers	Career success for women academics in higher education: Choices and challenges	2014	Career Success		Women academics in a HEI	Qual and quant
Prozesky	Gender differences in the journal publication productivity of South African academic authors	2006	Research productivity		Journal publications and authors	Quant
Sikhosana et al.	Experiences and challenges of black women enrolled in a STEM field in a South African urban university: A qualitative study	2023	Experiences and challenges	Computer Science	Black female students	Qual
Van Schalkwyk et al.	A systematic analysis of doctoral publication trends in South Africa	2020	Doctoral publication trends		Theses and journal articles	Quant
Walters et al.	The impact of the pandemic-enforced lockdown on the scholarly productivity of women academics in South Africa	2022	Research productivity		Women academics in public HE	Qual and quant

Figure A1: Female share of enrolment by discipline (CESM), 2012-2022

Female share of enrolment by discipline (CESM), 2012-2022



Note: Undergraduate qualifications are diploma, bachelor's and honours. Postgraduate qualifications include master's and PhDs. The 04 CESMs are business, economics and management studies.

Table A2: The gender gap in professorship explained vs. unexplained: 2012-2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Male	.178	.175	.178	.145	.145	.161	.144	.155	.158	.151	.145
Female	.042	.046	.062	.058	.061	.079	.085	.077	.083	.083	.098
Gap	.136	.129	.116	.088	.084	.081	.06	.078	.075	.068	.047
Explained	.076	.078	.078	.044	.049	.054	.049	.051	.053	.042	.035
Unexplained	.06	.051	.038	.043	.035	.028	.01	.026	.022	.026	.012
% of gap explained	55.8	60.1	67.2	50.6	58.4	66.2	82.7	66.3	70.9	61.8	74
Male - Black	.098	.09	.09	.072	.08	.098	.076	.065	.073	.075	.069
Female - Black	.019	.029	.026	.023	.031	.044	.031	.034	.054	.048	.049
Gap	.079	.061	.065	.049	.049	.054	.045	.03	.019	.028	.02
Explained	.032	.024	.026	.016	.027	.03	.028	.023	.028	.03	.023
Unexplained	.047	.037	.038	.032	.022	.024	.017	.007	-.009	-.002	-.003
% of gap explained	40.2	39.4	41	33.1	55	55.7	61.7	76.4	146.1	107.8	114.5
Male - White	.261	.262	.269	.215	.222	.238	.231	.276	.266	.256	.264
Female - White	.06	.059	.085	.088	.077	.112	.137	.119	.12	.126	.175
Gap	.2	.202	.184	.127	.145	.125	.095	.157	.145	.129	.089
Explained	.132	.149	.139	.079	.085	.098	.079	.101	.087	.057	.043
Unexplained	.068	.053	.046	.048	.06	.028	.016	.056	.059	.073	.045
% of gap explained	66	73.8	75.1	62	58.8	78	83.6	64.1	59.7	44	48.8
Male - White	.261	.262	.269	.215	.222	.238	.231	.276	.266	.256	.264
Black (Male & Female) + White Female	.067	.065	.072	.064	.066	.087	.08	.071	.079	.08	.086
Gap	.194	.196	.198	.151	.156	.151	.151	.205	.186	.176	.178
Explained	.128	.143	.168	.117	.125	.136	.101	.099	.088	.073	.08
Unexplained	.067	.053	.03	.034	.031	.015	.05	.106	.098	.103	.098
% of gap explained	65.7	73	85	77.3	80.2	90.1	67.1	48.1	47.4	41.4	44.8



## A.2 Technical notes

### A.2.1 Constructing the economics discipline using CESMs

For the purposes of this study, we construct the economics discipline using Classification of Educational Subject Matter (CESM) codes. Following Mouton et al. (2023), we deliberately use the word ‘construct’ as the meaning attached to ‘discipline’ varies across contexts. Mouton et al. (2023) reflect that a typical challenge is distinguishing the boundaries between a ‘discipline’ (which most scholars would define in terms of its cognitive or theoretical core) and a department at a university (e.g. in Luiz, 2004, 2009; Yu et al., 2017). From an administrative point of view, academic departments generally equate the two. However, what is meant by the ‘discipline’ of ‘economics’ in one department may be very different from how the discipline is understood at another Department of Economics at another university (Mouton et al., 2023). Other institutions will have inter-disciplinary departments. Since the HEMIS data does not have information on staff’s departmental affiliations,<sup>22</sup> CESM codes are used to construct the discipline of economics for our analysis. The limitations of this approach arise from incorrect submission of data to HEMIS from the respective universities, as well as cases where there are missing data. In particular, since we sum the share of a staff members time in an economics CESM to create a full time equivalent (FTE) staff member, where the share of academics’ time in the CESM is misreported, our measures may over or under count FTEs. Key for our analysis is that any potential measurement error is not related to gender and is constant across time.

### A.2.2 Identifying economics publications

With regard to publications, Mouton et al. (2023) reflect that scholars from the same discipline do not necessarily publish in the same set of scientific journals and that there have been increases in inter-disciplinary and trans-disciplinary journals that cater for scholars from different disciplines. Since our publication data are provided by CREST, we cite the approach they follow (Mouton et al., 2023, pp. 86–87): “In databases with collections of journal articles (e.g., Scopus or WoS), a journal is typically classified as belonging to one or more subject categories. The subject categories of a journal then also become the subject categories of the articles appearing in that journal. An output-based view of a discipline, therefore, means that a discipline is typically defined as the sum of all articles in journals that are assigned to a selection of subject categories considered to be representative of that discipline. As far as the Web of Science (WoS) database by Clarivate Analytics is concerned, an affiliation-based construction of a discipline was not

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<sup>22</sup>Mouton et al. (2023, p. 87) note that it is “very difficult, if not impossible, to map the CESM disciplinary information to the organisational departmental structures of universities.”

possible. It would have required that we identify, clean, and standardise not only all the South African addresses in the six disciplines but all addresses in all countries in those disciplines. Hence, an output-based approach to the definition of a discipline was the only feasible option for the WoS data, as each article (irrespective of where in the world it is published) appears in a journal with one or more subject categories. The relevant journal subject categories corresponding to a specific discipline were therefore identified and all articles in the world in those categories extracted to be used as a benchmark (in terms of both output volume and citations) for the South African set of articles in the WoS. In the case of the SAKnowledgebase (SAK) of CREST, an affiliation-based construction of a discipline was also followed, as the subject categories assigned to journals in the database are the same as those used by Clarivate Analytics in their Web of Science citation database. ‘Interdisciplinarity is covered by both the SAK and the WoS data, in the sense that the authors who publish in a journal that belongs to a specific discipline could come from any center, unit or department outside that discipline.’”

A limitation of these (necessary) output and affiliation based approaches is that the staff ‘heads’ in the economics discipline, constructed by CESM categories, would not directly correspond to staff underlying the publication data. That is, if a sociologist defined by CESM publishes in a journal classified as belonging to the economics subject category, this person will appear in our publication data but not in our staff data - and visa versa.

### A.2.3 PhD conversion rate formula

We follow Mouton et al. (2023) in using conversation rates as a measure of the ‘flow’ of students from master’s to PhD level. This is measured as the percentage of new PhD enrolments in a given year divided by the average number of master’s graduates in the previous three years as indicated in Equation 1. It reflects the rate at which master’s students convert to doctoral studies on average, and is not based on tracking a cohort of master’s students into PhD studies directly.

$$\text{PhD conversion rate}(\%) = \frac{\text{PhD new enrolments (year } x + 3)}{\text{Master's graduates}(\text{year } x + \text{year } x + 1 + \text{year } x + 2)/3} \quad (1)$$