INEQUALITIES IN ITALIAN COMPETITIVE RESEARCH FUNDING: EVIDENCE FROM THE PRINWINNERS DATASET[1]

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Abstract. The adoption of competitive grants for allocating public research funds is based on the assumption that competition enhances the efficiency of public expenditure, promoting higher quality in research processes and outcomes. However, the literature on the topic has pointed out some drawbacks of the competitive model. This analysis focuses on the indirect effect of competitive funding in enforcing inequalities among academic institutions and disciplinary macro-sectors in Italy. The study presents the PRINWINNERS dataset, encompassing approximately 6,500 research projects funded to over 18,500 recipients across 4 rounds of the PRIN programme from 2017 to 2022, including the extraordinary NRRP-labelled round in 2022. The general PRIN regulation sets an equitable distribution of funds across Life Sciences, Physical Sciences and Engineering, and Social Sciences and Humanities, but such equity is not always reflected within these areas. Using the proportion of tenured professors as benchmark, some disciplinary macro-sectors have benefited more from competition than others within the same area. A considerable amount of variability is observed in the median funding per recipient across academic institutions. Data analysis also shows that the universities specialised in bio-medical or technological research receive high median funding whereas those specialised in social sciences receive less, with Bocconi University being a noteworthy outlier. However, disciplinary specialisation alone does not predict the allocations well enough, indicating the need to investigate additional factors to better understand the dynamics shaping competitive outcomes.

1. Introduction

Over the last decades, the progressive introduction of competitive mechanisms in research funding has led to the proliferation of a growing number of national R&D programmes supporting a selected number of research projects based on a set of merit criteria such as scientific quality, originality and potential impact. The expansion of this funding model assumes that competition for financial resources fosters a more efficient use of public funds while improving the quality of research through processes of selection designed to identify promising projects and successful research teams (Lepori *et al.,* 2007).

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However, the adoption of competitive models for allocating research funding has raised concerns about the ambiguities and challenges associated with a fair distribution of research resources, as well as the systemic effects that such mechanisms may generate, including the penalisation of institutions with fewer resources when competing with excellent institutions, the adoption of opportunistic strategies to increase the chances of success in funding rounds, the reinforcement of cumulative advantage ("Matthew effect"), and a limited capacity to foster substantial disciplinary innovation (Laudel, 2006; van den Besselaar *et al.*, 2017; Wang *et al.*, 2018; Reale & Zinilli, 2020).

Some studies have addressed inequalities in the allocation of competitive research funding that can arise at both the disciplinary and institutional levels when some fields of study or institutions receive systematically higher shares of funding. For instance, a recent large-scale bibliometric analysis found that Life and Earth sciences hold a significant advantage in attracting grant support, with a high proportion of articles in these fields acknowledging funding over a ten-year period in the Web of Science database (Tian *et al.,* 2024). At the institutional level, studies have pointed to the over-representation of élite universities in successful funding bids, for example in the case of the 24 Russell Group universities in the United Kingdom (Liyanage *et al.*, 2024). This contribution investigates similar potential inequalities in the Italian context, with a particular focus on the PRIN programme.

2. Background: the PRIN programme in Italy

Historically, Italy has been a country characterized by a research funding distribution model based mainly on core (institutional) funding. Project-based funding in Italy has been marked by a limited number of instruments and a centralised administration at the ministerial level (Spinello *et al.*, 2023) and, according to the latest data available before the introduction of NRRP-related initiatives, only 10% of the country's research funding has been allocated through competitive mechanisms (Reale, 2018).

The main national competitive R&D instrument is the PRIN (*Progetti di Rilevante Interesse Nazionale*) established in the late 1990s, and it has always been managed directly by the Ministry of University and Research (MUR). Its historical aim has been to support collaborative projects of high scientific quality across Italian public research institutions, encouraging the creation of research networks. As a *curiosity-driven* programme, it has offered researchers the possibility of freely choosing topics and methods for their proposals, allowing greater freedom of exploration of innovative (inter)disciplinary topics compared to other instruments of research funding. PRIN projects follow the labelling system of the European Research Council (ERC) instead of the Italian disciplinary sectors, and the applicants are not formally bound to propose projects in the disciplinary areas of scientific qualifications[2] they are affiliated with (for

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[2] Established by MUR Ministerial Decree 855/30-10-2015 and by related previous decrees.

instance the subject they teach at university). It follows that e.g. a Professor of Literature or Biology can still be recipient for a project labelled with the ERC "The Human Mind and Its Complexity", which roughly corresponds to Psychology.

A historical limitation of the PRIN programme is that funds are allocated without scheduled calls or parameterised budgets. It allowed MUR to arbitrarily skip the funding of PRIN for one or more years: until 2010, PRIN rounds were published annually but then their frequency became biennial or triennial, often with a highly variable financial budget. The 2010 round allocated approximately 170 million euros, then only 32.3 million in 2012, and 91.9 million in 2015.

The 2017 round marked a significant increase in available funds, reaching 391 million euros. The programme introduced two important innovations, recognising potential unfairness in the outcomes of previous rounds: the inclusion of a preferential line reserved for projects led by young researchers under 40 years old, with the aim of encouraging generational turnover; and a clause to allocate a percentage of the budget of the round to projects where all the recipients are affiliated with research institutions in Southern Italy. Since the 2017 round an increasing number of scholars from non-academic institutions have had access to funding. The year 2022 saw a relevant surge in the budget thanks to the implementation of the fourth mission of National Recovery and Resilience Plan (NRRP) "Education and Research": MUR has launched two rounds for proposals of the PRIN programme "2022" (742 million euros) and "2022 NRRP" (420 million euros). The NRRP-labelled round was aimed to align national research with the strategic priorities of European research. In fact, the programme has introduced a specific requirement to include in the proposals emerging strategic themes in line with the objectives of the European Framework Programme for Research and Innovation 2021-2027. Additionally, with the NRRP-labelled round the MUR adopted a guideline requiring that 60% of the budget be allocated to Southern Italy.

3. Analysis of the PRINWINNERS dataset

PRINWINNERS is a dataset, managed by CNR-IRCrES, that provides a collection of three 'regular' funding rounds of the PRIN programme from 2017 to 2022, plus the extraordinary NRRP-labelled round of 2022 (hereafter referred to as NRRP). The unit in the database is the funding recipient, who can be the national-level principal investigator, or the researcher responsible of a local unit of it. Information about the project, e.g. title, ERC label of the project, etc., is linked to specific information about the recipients, e.g. the funding they received, their scientific affiliations, etc. A recipient may appear in multiple rounds. Academic recipients constitute the majority of all recipients, and most of the funding is concentrated in the 2022 round (Table 1)[3].

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[3] Data sources for PRINWINNERS are the Directorial Decrees of the MUR for funding admission and reallocations: a corpus of around 100 documents which have been digitally organized for the

Table 1 – *Summary of the PRINWINNERS dataset.*

	Projects	Recipients	Academic Recipients	€
2017	664	2,763	2,536	381,226,706
2020	308	1,259	1,153	178,649,593
2022	3,754	10,110	9,003	741,925,632
NRRP	1,780	4,611	4,105	419,973,843
Total	6,506	18,743	16,797	1,721,775,774

3.1. Inequalities among scientific disciplines

The ERC macro-labels correspond vaguely with traditional academic disciplines and are grouped under three areas: Life Sciences (LS), Physical Sciences and Engineering (PE), and Social Sciences and Humanities (SH). Each macro-label is associated with more specific labels (see Tables 2.a, 2.b, 2.c).

The allocation of funds follows the guidelines highlighted in the PRIN calls to minimise inequalities among these three areas of the ERC classification[4]: when summing all funding in PRINWINNERS, LS and PE receive the same allocation of around 607M € (LS: 2,241 funded projects, PE: 2,292). SH received around 16% less funding (507M € in 5,907 projects). Within these areas, the proportion of funds has been stable over time except for the NRRP round, which was more focused on applied science (also, some labels did not exist before 2022, e.g. Environmental Engineering).

The allocation has not been uniform among the micro-labels. Life Sciences are dominated by applications, Diagnostic tools, Physiology, Biotechnology, and Public Health; PE includes a larger number of labels, with only the dominance of Products and Processes Engineering. Among the SH there is more uniformity with remarkable allocation of funds for the study of Cultures and Cultural Production, which received around 20% of all funding. It is not straightforward to determine if these proportions among ERC labels are justified, given that at macro level these are fixed instead. It is noteworthy that inequalities may be driven by the participation of academic recipients on projects that do not correspond to their discipline.

In Table 3 the following benchmark:

$$\frac{\text{n of tenured professors in the discipline}}{\text{N of tenured professors}}$$

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constitution of this dataset. Information about recipients have been retrieved by matching data on academics with the "Cerca Università" ("Search for University") web portal managed by MUR. The dataset was finalized in the early months of 2024; therefore, it does not account for the reallocations of PRIN 2022 round, issued in September 2024.

[4] By Art. 3 of MUR Directorial Decree 3728/27-12-2017; and by Art 4. of MUR Directorial Decrees 1628/16-10-2020, and 104/2-2-2022, and 1409/14-09-2022. These can be accessed at https://prin.mur.gov.it/Iniziative .

is checked against the proportions of allocation of funds.

Table 2.a – *Relative allocations of funds to projects in Life Sciences.*

ERC Label: Life Sciences (LS)	2017	2020	2022	NRRP
Applied Life Sciences and Biotechnology	.157	.172	.158	.163
Cellular and Developmental Biology	.07	.078	.072	.067
Diagnostic Tools, Therapies and Public Health	.168	.185	.171	.173
Ecology, Evolution and Environmental Biology	.065	.082	.088	.075
Genetics, Genomics, Bioinformatics and Systems Biology	.082	.08	.085	.086
Immunity and Infection	.093	.086	.085	.076
Molecular and Structural Biology and Biochemistry	.065	.073	.083	.102
Neurosciences and Neural Disorders	.126	.107	.116	.114
Physiology, Pathophysiology and Endocrinology	.175	.137	.141	.144

Table 2.b *Relative allocations of funds to projects in Physical Sciences and Engineering.*

ERC Label: Physical Sciences and Engineering (PE)	2017	2020	2022	NRRP
Computer Science and Informatics	.092	.098	.088	.1
Condensed Matter Physics	.08	.081	.078	.072
Earth System Science	.089	.095	.094	.1
Environmental Engineering	0	0	.054	.068
Fundamental Constituents of Matter	.099	.093	.089	.036
Mathematics	.072	.06	.069	.059
Physical and Analytical Chemical Sciences	.07	.067	.075	.081
Products and Processes Engineering	.221	.208	.185	.226
Synthetic Chemistry and Materials	.089	.1	.102	.128
Systems and Communication Engineering	.127	.141	.113	.119
Universe Sciences	.06	.059	.053	.01

Table 2.c – *Relative allocations of funds to projects in Social Sciences and Humanities.*

ERC Label: Social Sciences and Humanities (SH)	2017	2020	2022	NRRP
Cultures and Cultural Production	.221	.209	.201	.175
Human Mobility, Environment, and Space	0	0	.078	.116
Individuals, Markets and Organisations	.147	.181	.173	.187
Institutions, Values, Beliefs and Behaviour	.215	.199	.145	.141
The Human Mind and Its Complexity	.148	.159	.164	.132
The Social World, Diversity, Population	.118	.125	.101	.146
The Study of the Human Past	.151	.126	.138	.101

Taking Humanities as an example, Area 10 (Languages) and Area 11 (other Humanities) have been underfunded compared to this benchmark. A possible explanation for this is that research in Humanities is carried out by multidisciplinary research groups (Cantone, 2024). This is rather evident noticing the dominance of the most funded Area 5 (Biology), also the most outperforming the benchmark. By contrast, Area 12 (Law) receives a low share of PRIN funds, with exception of International Law. While there are also differences in the proportion of allocated funds between the ordinary

rounds and the NRRP-labelled one, none is particularly sharp. Table 3 covers allocations within areas, as well. Some cases are noteworthy. For example, while in Italy there are more tenured professors in Business (42% of Area 13), 55% of the funds went to recipients affiliated with Economics.

Table 3 – *Relative allocations of funds among the Italian academic population.*

Area	Bench. (Ar.)	PRIN	NRRP	Macro Disciplinary Group	Bench.	PRIN	NRRP
01	**.058**	**.037**	**.033**	Mathematics	.713	.622	.562
01				Computer Science	.287	.378	.438
02	**.044**	**.06**	**.042**	Fundamental Interactions	.38	.312	.152
02				Physics of Matter	.37	.441	.515
02				Astrophysics	.107	.153	.078
02				Applied Physics	.143	.095	.255
03	**.052**	**.062**	**.079**	Analytical Chemistry	.258	.279	.232
03				Inorganic Chemistry	.256	.25	.31
03				Organic Chemistry	.229	.244	.252
03				Pharmaceutic Chemistry	.257	.227	.206
04	**.019**	**.015**	**.016**	Geosciences	1	1	1
05	**.08**	**.139**	**.137**	Plant Biology	.105	.074	.131
05				Animal Biology	.097	.07	.089
05				Ecology	.044	.037	.032
05				Physiology	.116	.141	.124
05				Biochemistry	.271	.242	.197
05				Applied Biology	.072	.085	.102
05				Pharmacy	.122	.194	.147
05				Human Anatomy	.102	.062	.082
05				Genetics	.071	.095	.095
06	**.144**	**.119**	**.11**	Pathology Diagnostics	.151	.311	.298
06				Internal Medicine	.065	.065	.054
06				General Surgery	.062	.015	.014
06				Specialist Medicine	.24	.333	.349
06				Specialist Surgery	.08	.018	.029
06				Integrated Surgery	.12	.037	.051
06				Pediatrics	.04	.045	.026
06				Gynecology	.028	.016	.005
06				Radiology	.042	.016	.016
06				Anesthesiology	.022	.013	.004
06				Public Health	.092	.049	.051
06				Health Professions	.059	.082	.103
07	**.055**	**.052**	**.052**	Agricultural Economics	.107	.073	.082
07				Agriculture and Forestry	.146	.187	.118
07				Biosystems Engineering	.072	.098	.085
07				Plant Pathology	.078	.119	.135
07				Agro-Chemistry	.085	.113	.146
07				Food Technology	.068	.075	.058
07				Animal Technology	.114	.118	.116
07				Veterinary	.279	.146	.204

Table 3 (cont.) − *Relative allocations of funds among the Italian academic population.*

Area	Bench. (Ar.)	PRIN	NRRP	Macro Disciplinary Group	Bench.	PRIN	NRRP
07				Agricultural Microbiology	.053	.071	.055
08	**.066**	**.042**	**.053**	Infrastructures and Territory	.246	.311	.235
08				Geotechnical Engineering	.226	.383	.379
08				Architectural Technology	.161	.085	.085
08				Architectural Design	.127	.052	.07
08				Restoration	.157	.095	.106
08				Urban Planning	.082	.074	.125
09	**.107**	**.106**	**.116**	Mechanical Engineering	.158	.1	.161
09				Industrial Engineering	.104	.07	.091
09				Energetic Engineering	.12	.122	.104
09				Materials Engineering	.104	.132	.162
09				Electrical Engineering	.179	.168	.167
09				Telecommunications	.091	.101	.072
09				Bioengineering	.102	.148	.115
09				Software Engineering	.142	.159	.129
10	**.086**	**.076**	**.051**	Archaeology	.084	.12	.171
10				Art History	.082	.061	.069
10				Media Studies	.082	.141	.128
10				Studies of Antiquity	.117	.093	.129
10				Middle-age Literatures	.038	.047	.037
10				Italian Studies	.146	.186	.124
10				Linguistics	.064	.115	.114
10				French Studies	.049	.017	.025
10				Spanish Studies	.058	.033	.027
10				English Studies	.109	.042	.026
10				Germanic & Slavic Studies	.086	.036	.056
10				Oriental Studies	.085	.11	.095
11	**.08**	**.068**	**.071**	History	.249	.294	.159
11				Geography	.073	.068	.057
11				Philosophy	.22	.165	.217
11				Pedagogy	.158	.063	.072
11				Psychology	.299	.411	.495
12	**.084**	**.035**	**.031**	Private Law	.137	.076	.093
12				Commercial Law	.143	.115	.111
12				Public Law	.125	.117	.208
12				Administrative Law	.132	.124	.074
12				International Law	.199	.29	.28
12				Civil Procedures	.042	.012	.012
12				Criminal Law	.088	.054	.108
12				History of Law	.134	.21	.115
13	**.094**	**.053**	**.065**	Economics	.315	.56	.554
13				Business	.425	.182	.184
13				Economic History	.035	.053	.036
13				Statistics	.225	.205	.225
14	**.031**	**.027**	**.03**	Political Theory	.205	.268	.267
14				Political History	.205	.114	.018
14				Sociology & Applied Soc.	.59	.618	.715

3.1. Inequalities among research institutions

In the PRINWINNERS dataset there are 129 research institutions that received funding in at least one round of the PRIN programme. In Table 4, key indicators are reported for the 74 institutions that have at least 30 recipients across the four rounds of funding.

Among these, the number of recipients is indicative of the size of the institutions in terms of tenured professors, but also of the capacity to attract competitive funds. For example, even if the largest university in Italy is "Sapienza" in Rome, with 1,818 tenured professors in 2022, "Federico II" University of Naples (1,423 tenures) gained the same amount of funds from the ordinary PRIN programme rounds and more than twice as much the extraordinary NRRP-labelled round, with a median allocation per unit that is even higher.

Indeed, variability in the median allocation of euros for unit calls for closer examinations. A first attempt is to correlate the allocation with the specialisation in the ERC macro-labels of the funded projects, that is the percentage of projects under these labels (Table 4). A correlation analysis finds weak positive correlations of the median allocation with the specialisation in PE (Kendall = 0.04), and with LS (Kendall = 0.16). A stronger negative correlation is with SH (Kendall = -0.26). This latter correlation is expected given the allocation among the three macro-labels (see Section 3.1), and yet it does not explain how the university with the highest median allocation per unit – "Bocconi" University in Milan – is specialised in SH. Indeed, all the universities located in Milan receive more funding per unit, not only compared to the universities located in the rest of Italy, but also compared to those in the rest of the Lombardy region. In fact, striking is the difference in median allocation per unit between Bocconi and the University of Bergamo or between "Humanitas" and "Insubria" in Table 4.

The NRRP round fulfilled its mission to balance the territorial inequalities between Southern areas and the rest of the country (46% of allocations vs. previous 27%, see Table 5), also considering that for the three large universities "Federico II" in Naples, Palermo. and Catania, the ordinary round of 2022 underperformed compared to previous rounds. By contrast, Bari has registered a stable allocation and very good performance with NRRP funds. Small Southern universities overall benefited from the two 2022 rounds.

Table 4 – *Recipients, allocation per unit, and specialisation in research institutions.*

Institution	PRIN	NRRP	Med. €	LS	PE	SH
N. Inst. Astrophysics	65	6	116432	0	1	0
"Bocconi" Uni., Milan	65	14	103116	.01	.08	.91
"Humanitas" Uni., Milan	44	9	102653	.98	.01	.01
"Gran Sasso" Inst., Aquila	33	10	98033	.01	.8	.19
"Anton Dohrn" Inst., Naples	23	14	95768	.96	.04	0
Milan Uni.	621	132	95000	.57	.18	.24

N. Inst. Nuclear Physics.	123	22	93369	.04	.96	0
"Campus Bio-Medico", Rome	32	11	92855	.5	.4	.1
"Sant'Anna" Inst., Pisa	67	21	91167	.21	.29	.5
"Federico II" Uni., Naples	715	346	91036	.45	.37	.18
"A. Avogadro" Uni., Vercelli	86	31	90666	.56	.19	.25
"MagnaGraecia" Uni., Catanzaro	71	47	90000	.8	.1	.1
Trento Uni.	248	63	89893	.19	.38	.43
"Cattolica" Uni., Milan	234	54	89074	.47	.07	.46
"SISSA" Institute, Trieste	57	4	88613	.1	.71	.18
Milan Polytech.	338	78	88043	.06	.73	.2
"Bicocca" Uni., Milan	285	73	87937	.29	.36	.35
Padua Uni.	630	152	87327	.41	.32	.27
Nat. Research Council (CNR)	1140	432	87063	.41	.49	.09
Perugia Uni.	211	53	87051	.38	.38	.24
Salerno Uni.	203	121	86100	.28	.49	.24
"Sapienza" Uni., Rome	706	153	85500	.37	.29	.34
N. Inst. Geophysics	30	13	85499	0	.97	.03
Tuscia Uni., Viterbo	86	26	84587	.57	.13	.3
"San Raffaele" Institute, Milan	54	17	84281	.75	.04	.22
Camerino, Uni.	62	21	83987	.53	.37	.09
Verona Uni.	190	52	83945	.41	.12	.46
"Alma Mater" Uni., Bologna	711	161	83634	.28	.3	.42
"Normale" Uni., Pisa	56	6	83601	.1	.47	.43
Pavia Uni.	268	68	83358	.37	.34	.29
Ferrara Uni.	142	43	83077	.48	.3	.22
"Tor Vergata" Uni., Rome	276	67	83000	.42	.36	.21
Modena Reggio Uni.	190	45	82384	.33	.42	.24
Florence Uni.	425	111	81993	.36	.3	.34
"Aldo Moro" Uni, Bari	238	152	81620	.44	.27	.29
Pisa Uni.	377	80	81510	.33	.41	.27
Parma Uni.	194	51	81335	.4	.35	.26
"d'Annunzio" U., Chieti Pescara	105	62	80790	.38	.14	.48
Teramo Uni.	34	21	80687	.48	.11	.41
Brescia Uni.	123	34	80000	.43	.41	.17
Salento Uni., Lecce	120	76	79951	.17	.35	.47
Turin Uni.	504	119	79438	.44	.18	.37
Siena Uni.	157	46	79343	.42	.15	.44
"L. Vanvitelli" Uni., Caserta	193	119	78557	.57	.25	.18
"L'Orientale" Uni., Naples	40	11	78500	0	.02	.98
Cagliari Uni.	166	85	78477	.27	.43	.3
"Carlo Bo" Uni., Urbino	72	22	78456	.3	.22	.47
Marche Polytech.	114	21	78407	.55	.27	.18
Udine Uni.	148	26	78181	.32	.23	.45
"Roma Tre" Uni., Rome	203	45	78085	.13	.33	.55
Catania Uni.	243	111	78050	.37	.33	.3
Torino Polytech.	217	64	78047	.08	.78	.14
Calabria Uni., Cosenza	147	91	77976	.24	.51	.25
Bari Polytech.	62	51	77864	.01	.85	.14
Genova Uni.	284	69	77000	.27	.43	.3

Table 4 (cont.) – *Recipients, allocation per unit, and specialisation in research institutions.*

Institution	PRIN	NRRP	Med. €	LS	PE	SH
Sassari Uni.	79	44	76819	.41	.23	.36
"Parthenope" Uni, Naples	69	41	76520	.13	.59	.28
Palermo Uni.	256	117	75956	.28	.36	.36
"Kore" Uni., Enna	21	9	75683	.2	.24	.57
Foggia Uni.	62	35	75099	.42	.06	.52
Trieste Uni.	153	34	75001	.35	.41	.24
Aquila Uni.	104	56	74964	.34	.51	.15
Messina Uni.	173	105	74700	.39	.34	.27
"Ca' Foscari", Venice	132	38	74258	.04	.19	.77
Sannio Uni., Benevento	46	31	73430	.24	.66	.09
Insubria Uni., Varese Como	72	12	72661	.57	.24	.19
Molise Uni., Campobasso	51	27	72075	.53	.15	.32
"LUISS G. Carli" Uni., Rome	40	6	70732	0	.04	.96
Bolzano/Bozen Uni.	56	9	69498	.26	.28	.46
Basilicata Uni., Potenza	46	38	68740	.46	.3	.24
"Mediterranea" Uni., R. Calabria	48	28	68167	.26	.4	.33
Cassino Uni.	44	14	67811	.02	.63	.35
Bergamo Uni.	69	19	66467	0	.17	.83
Macerata Uni.	44	10	58047	.01	.03	.96

Table 5 – *% of received € over top 74 institutions in Southern Universities.*

Universities	Region	2017	2020	2022	NRRP
Federico II, Naples	Campania	.07	.056	.057	.089
Bari	Apulia	.02	.017	.018	.037
Palermo	Sicily	.023	.013	.019	.026
Catania	Sicily	.021	.023	.015	.026
ALL of Calabria	Calabria	.026	.014	.019	.037
ALL of Sardinia	Sardinia	.021	.011	.018	.032
ALL of Abruzzo	Abruzzo	.015	.016	.018	.036
Salerno	Campania	.017	.021	.014	.031
Vanvitelli, Caserta	Campania	.014	.023	.014	.028
Messina	Sicily	.013	.006	.012	.022
Salento, Lecce	Apulia	.007	.009	.009	.019
Others in South Italy		.028	.032	.029	.053
Others not in South Italy		.724	.756	.759	.561

4. Conclusions and future developments

Results of the study are consistent with international findings presented in the Section 1: Life Sciences and élite institutions perform well in the Italian competitive model of the PRIN programme. A key insight may lie in the inconsistency of the SH label in representing a unitary area of research. There are signals that, while competitive funding naturally cannot favor all institutions, the competition within LS and PE is healthy with many well-performing actors, but this is not the case for SH, which appears to be

dominated by Bocconi, indeed. Future studies could track the state of competition with advanced measures of concentration (Cantone, 2024). Such studies would be also useful to help policy-makers account for this difference between macro-areas in the design of the next generation of funding programmes.

In general, the low correlations found in this study justify the adoption of complex models to explain the inequalities in the allocation of funds. There is also a correlation between the number of funded projects (PRIN + NRRP in Table 4) and the median allocation (Kendall = 0.13). Evidence does not support attributing this to a lack of large institutions specialised in SH because the Kendall correlation between specialisation in SH and the number of funded projects is null instead. Hypothetically, while large and prestigious institutions may simply employ a greater number of highly qualified researchers, it is also possible that potential recipients affiliated with these institutions have access to better opportunities for negotiating richer projects, as the case of Milan discussed in Section 3.2 appears to illustrate.

Furthermore, the PRINWINNERS dataset allows for an assessment of whether the requirement that restricts access to reserved funding to projects presented by researchers all affiliated with Southern universities should be reconsidered. Indeed, the clause mandating that a share of the PRIN budget be allocated to projects in which all recipients are affiliated with research institutions in Southern Italy may restrict opportunities for researchers in Southern universities willing to collaborate with qualified colleagues from institutions outside the South. This could both generate unexpected consequences on scientific quality and affect the creation of networks. Current evidence shows that, in the long run, it could be appropriate to move beyond purely geographical criteria and focus on identifying the specific structural issues faced by disadvantaged universities, irrespective of the territorial area where they are located.

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