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The effect of being awardees for academic careers. ERC and FIRB recipients' outcomes compared to ordinary academics – performances and promotions.

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Abstract

Some individual funding schemes aim at recognize excellence of early and/or mid-career researchers in order to allow them boost their potential. Some schemes are munificent endowments, assuring autonomy and security. This is the case of one of the European flagship schemes – the European Research Council (ERC). In Italy, a very similar scheme called FIRB has a similar rationale. Both schemes are supposed to make excellence "fly higher". The paper checks whether such ERC and FIRB recipients are thereafter more productive in terms of quality and influence testing against a control group of Italian academics of similar age, rank and discipline who did not win such individual grants. Results show that ERC recipients ameliorate research performance more than FIRB recipients did, although differences with control group don't show always a particular additional effect in research outputs when comparing with pre-awarding performances (difference-in-difference tests). On the other hand, we find a strong Matthew effect in promotions, being the credential of having recipient of an ERC or a FIRB per se the strongest predictor of promotion, other achievements being equal. Policy recommendations speculate whether an egalitarian non-stratified higher education system like the Italian one is ideal home for these schemes, and whether the Italian system can afford a national scheme overlapping international ones, considering long-lasting shortage of financial resources and the egalitarian structure of its system.

Keywords: Policy effect; Grants recipients; European Research Council; FIRB; Early and mid-career researchers; Research performance; academic career; promotions

JEL Codes: C930, I230, M520, O320, O380

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Introduction. The issue of excellence in an egalitarian system

Grants specifically devised to facilitate careers have their own tradition dating several decades ago at least in the US (Baldwin 1981). In Europe, the idea of having specific grants to allow early and mid-career researchers to find their "own roads" is relatively more recent. Perhaps the most famous of these schemes is ERC that is aimed at individuating and promoting excellence (Hoenig 2017). This new elite is arguably enacting some disparities. The Matthew effect in science in fact is notorious (Merton 1968), being the effect on careers one of the main points in case about possible unfair consequences of feedforward mechanisms. Recent managerial literature, not necessarily in science and technology research field, highlights the role of Matthew effect as disruptive, if respective Mark effect (redistribution effect) does not appear in an arena with the result to keep such arena genuinely competitive, rather than conflicting (Piezunka et al. 2018). Following such critical reflection about the actual nature of Matthew effect (excellent funding only for excellent people), it is necessary to understand whether specific funding schemes are assuring the outcomes they have been devised for. Both these two funding schemes, ERC and FIRB, have the blueprint to act like *status boundary* with decisive, and potentially unfair, consequences for the future of non-awardees. By discussing unequal advantages in being awarded with an ERC or a FIRB, we empirically investigate if such grant holders developed or not in their post-awarding grant careers the expected performance. The expected performance is to outscore those similar colleagues who did not receive these individual grants accounting for the pre-awarding respective performances. In terms of career advancement, grant recipients higher share of promoted should be explained by publication performance only. The idea that promotions ought to happen at parity of performances is however not reflecting a purely marginal assumption: if two persons with same performances had different opportunities, such as having been awarded or not, the latter should result as to be preferred. This preference is explained by the fact that he/she produced the same tantamount of scientific outputs (and/or the same tantamount of quality of research) with a lower denominator of resources, resulting, in other words, more efficient at parity of output.

Some contextual descriptions are essential to understand how data allows certain interpretations. In comparison to other countries like for example the Netherlands (Bol et al 2018) or in the States (Gonzales 2014; Young 2008), careers in the Italian higher education system are not based on accumulation of grants. Some major national grants like PRIN (*Progetti di Rilevante Interesse Nationale*, Projects of National Relevance) are competitive, but usually spread across community with lists of co-PIs equally able to pursue some autonomy. Considering the amount of resources at stake and the whole rationale, PRIN is arguably less likely to generate the Matthew effect FIRB or ERC aim at. In this respect, the Italian context is different from the Japanese one (Shibayama 2011) for distributing many minor opportunities (including non-ministerial ones such as from local public entities, public companies, agencies, foundations, etc.) almost uniformly by institutions. Moreover, ERC and FIRB in the Italian context are the only two main funding schemes that do not just fund a specific project, but boost research for early and mid-researchers specifically, assuming a 100% of budget allocation for a reasonably long span of time, typically around three years. Arguably, the presence of a plethora of minor funding opportunities contributes to avoid the accumulation of grants as per se an indicator of success. This scenario conveys an ideal terrain to design an analysis based on assessing both ERC and FIRB recipients as individual careers turning points. Also the structure of teaching load and other administrative duties, grant capture included, is much uniformed in Italy in comparison to other contexts like Anglo-Saxon systems (Anderson & Slade 2016), assuring a better term of comparison between before and after a single major grant acquisition.

Funding for boosting promising careers

The European Research Council (ERC), established in 2007, is one of the most important funding schemes at European level. Its main "mission is to encourage the highest quality research in Europe through competitive funding and to support investigator-driven frontier research across all fields, on the basis of scientific excellence"[3]. This policy by time gained prestige at international level.

FIRB (*Futuro in Ricerca*, or *Futuro in Ricerca di Base* – Future in Research) are some competitive grants awarded by the Italian Ministry of Research and Higher Education in four editions from 2008 until 2013. It was a scheme aimed at awarding specific funding for researchers at their early stage of career. Such schemes identify specific projects the recipients were expected to carry on, with the mandate also to improve international outreach in research (Primeri et al. 2014) and to promote some more opportunities in recruitment for permanent positions as well. In essence, FIRB rationale was to bestow already promising researchers with non-ordinary funding opportunities to generate a group of excellence within the generally underfunded Italian higher education system, a context relatively poor for opportunities in terms of funds for projects and for recruitment opportunities. In this light, FIRB is not particularly different from ERC competitive projects.

Data

The dataset is a set of scientific publications downloaded from Scopus, clustered by univocal authors. The total number of observations is around 67.000 publications clustered in around 1000 univocal authors. Authors are the whole list of FIRB and ERC recipients in some years. We collected all FIRB recipients in the following years: 2008, 2010, 2012, 2013. Years of issuing FIRB grants and actual moment in conferring the grant to winners may lapse one or two years, therefore the moment of treatment is postponed to two years after announcement (see *Period* variable below). This happened because FIRB calls took name from the moment of launching. The time to assess applicants is usually long. On top of this length of time, some more time is needed to see the effects of publishing. The dataset also considers ERC recipients affiliated in Italy at the rank of assistant professors and associate professors who got such grants in the same years. We add on top of this list of people an ad hoc designed control group from the universe of Italian academics, weighting by rank and disciplinary field in order to maximise comparability. We considered scholars present in the official staff archive of MIUR (https://cercauniversita.cineca.it/php5/docenti/cerca.php) in the same years when ERC and FIRB recipients saw their projects approved and funded (see below *Treatment* for more details). For each year, we extracted a slightly superior number of Italian academics in the same rank in order to compose a statistically robust control group.

The dataset is built accounting for some constraints. Awardees are few, and this problem brings consequences in terms of dataset construction and respective data analysis techniques. If renounced to use propensity score matching primarily for statistical robustness. Second, we prefer to keep individual publications as observation to tackle the problem of robustness, opting for clustering regressions by univocal authors to account for better estimation of standard errors. Third, the disciplinary feature is tricky in comparing scholars from very different publication

[3] https://erc.europa.eu/about-erc/mission.

traditions. We covered this problem in selecting with maximum comparability possible the control group, arriving to a fair dataset.

Treatment and period. Treated authors are those who received any FIRB or ERC. Among all recipients, 13 people have won both a FIRB and an ERC, showing poor agglomeration effect as instead found in Sweden (Hallonsten & Hugander 2014). We keep in the analysis these researchers both among FIRB and ERC recipients. Control group is randomly extracted by the set of observable characteristics of each awardee, namely rank and discipline at SSC – a very fine-grained level of disciplinary detail. Period is essential to run a difference-in-difference analysis: p_0 are publications happened in pre-treatment and p_1 publications happened in post-treatment. For each person in control Group the year identifying pre- and post-treatment depends by the grant recipient in question we extracted the control group.

Number of authors. This variable takes into account how many co-authors were listed by each publication. It is relevant to keep this information as a confounding variable in analysing international co-authorships and quality of research, due to demonstrate correlation among these bibliometric information and citation acquisition (Hsu & Huang 2011). In this dataset, in fact, the number of co-authors per output and the gross number of citations per output has a positive correlation. Interestingly, Table 1 shows that non-recipients, both before and after treatment, publish research with more co-authors (from 6.8 into 10.5 co-authors per outputs). ERC recipients show fewer number of co-authoring colleagues, and at the same time they almost did not increase this figure (passing from 5.9 into 6.1). This variable is hence an essential confounding variable when testing quality of publications by proxies such as citations.

International collaborations. This variable defines whether each publication was co-authored with at least another colleague affiliated in any other country but Italy, and, if yes, how many countries were included. This variable is computed from the list of affiliations of co-authors identifying some 60 countries. Around 60% of publications are not internationally co-authored. Among the other internationally co-authored publications, as expected, this distribution is very skewed. Only 1% scientific outputs are co-authored by colleagues affiliated in six or more countries. International collaborations are essential to account for two aspects. First, ERC and FIRB are respectively international and national schemes, so that FIRB, although aimed at excellence, might perform less prominently in facilitating international collaborations. Second, FIRB explicitly acknowledged as a rationale and goal that of boosting international collaborations and international grant captures. Hence, it is important to assess if and to what extent FIRB recipients achieved such goal. We note from Table 1 an increase in one's international collaborations by all three sets. ERC recipients passed from 0.7102 into 1.0958; FIRB recipients from 0.6058 into 0.7806; sampled people in the control group from 0.4276 into 0.7697. Although these figures are consistent with previous research about ERC awardees (Pina et al. 2019) or similar Swedish schemes (Melin & Danell 2006), the advantage of this research design is to compare against non-awardees.

SJR. Scimago Journal Ranking is a measure of relevance and prestige of any journal or proceeding publication. For outputs related to non-ranked value by Scimago, we compute a zero value, on the assumption that no recognition at all equals no relevance at all in international scientific community, or at least arguably an inferior value to any other low ranked journal. This distribution is skewed. This variable is consistent with previous studies concerning a comparison between awarded against non-awarded scientists in funding scheme such as ERC (Neufeld et al. 2013), proposing on the other hand a more in depth statistical analysis of the effect of publishing in some specific journals by grant capture success. From Table 1 averages of SJR demonstrate an increase for all three groups between a pre- and post- treatment, although this increase is not proportionate

such as pre-treatment averages that are remarkably different among the three groups. ERC recipients are the most performing (1.7 in p_0 vs. 1.9 in p_1), followed by FIRB recipients (1.5839 vs. 1.6212 in p_0 and p_1), and control group academics who almost did not improve at all this measure by time.

Q1. This variable defines if any specific publication appeared in a journal or proceeding listed as first quartile in Scimago list of journals. This variable splits almost perfectly the dataset between publications appeared in first quartile journals, or in any other quartile. More precisely, ERC recipients published 59% of publications in Q1 venues in p_0 and 65% in p_1. FIRB recipients passed from 58% into 62%. Last, control group performed in p_0 with a much lower percentage of publications in Q1 in pre-treatment (40%), for later in p_1 improving reaching 47% of their publications in first quartile (see Table 1).

Normcit. We use a normalised measure of citations by year of publication to account another measure of quality of publication than Q1 and SJR. In this case, citations are scaled by the number of years elapsed from present (2019). Likewise other variables, ERC grant recipients are notably with better performances in comparison to the control group. Nevertheless, FIRB recipients appear to decrease instead of increasing their number of citations. Comparing pre- and post- moment of grant acquisition, Table 1 shows an increase for all three groups: from 4.6 into 3.1 for ERC awardees; from 3.2 into 2.3 for FIRB recipients; from 1.6 into 1.8 among control group non main grant recipients.

Language. English is used as the only language of publication in 97% of the cases in this dataset. Publications written in Italian are 2.5% of the total. Arguably, publications that don't use English are expected to be possibly less likely to reach the international audience. For all three group, this value goes up towards a saturation of use of English, possibly as an effect of more emphasis over research evaluation.

Open Access (*OA*). Publications in open access mode among non-open access mode in same journals are a mode of publishing that have obtained attention in literature – namely Open Access articles receiving on average more citations (Wang et al. 2015). We use this variable as a confounding one on the ground that according to descriptive statistics, recipients appear to more likely publish articles in this form. Overall, almost 16% of publications are open access. Following Table 1, control group academics in p_0 published 13.5% of their publications in open access, whereas ERC and FIRB recipients in p_0 published respectively 10.3% and 11.8% of their outputs in this mode. In post-treatment period, control group individuals increased minimally towards 14.4%, whereas ERC and FIRB recipients more than doubled their mode of publication arriving to publish around a quarter of their publication in this way. Arguably open access publications are a consequence of more resources represented by being awarded grants like ERC and FIRB (e.g., budget allocated specifically for publishing). Possibly, this difference against the control group might be represented by more relevant topics that editors end to prefer to publish in OA. For the relevance of this paper hypothesis, publishing in OA is not per se a performance, but it could be one of those side advantages rolled over by grant recipients.

Table 1 – Descriptive statistics (weighed averages by univocal individual) by recipients

	Control Group		ERC		FIRB	
	p_0	p_1	p_0	p_1	p_0	p_1
SJR	0.9855	1.0104	1.6825	1.9187	1.5839	1.6212
OA	0.1350	0.1444	0.1035	0.2509	0.1186	0.2438
lang	0.9543	0.9609	0.9944	0.9982	0.9712	0.9961
no_authors	6.8289	10.4922	5.9398	6.0600	6.8046	8.6935
q1	0.4080	0.4717	0.5923	0.6594	0.5829	0.6254
normcit	1.5971	1.7687	4.6047	3.1203	3.1632	2.3215
intcoll	0.4276	0.7697	0.7102	1.0958	0.6058	0.7806

Promotion. Promotion is computed after five years of the moment considered as splitting between pre- and post-treatment. Promotions happened from assistant professor to associate professorship level, or from associate professorship to full professorship rank. In a handful of cases, assistant professors after five years became full professors. Some 132 individuals are considered missing values for this variable as they do not appear as employees in any Italian university in the second moment stage (year of treatment plus 5). These people might have got an academic position abroad (which is the most likely scenario), having got any non-academic positions, or might have found a position in a research institute that is not included I the universe of Italian academics. Less likely they retired or died considering that the analysis comprises academics of no higher rank than associate professor and that on average they are relatively young. From Table 2 it is visible that people who received one of these two major grants are more often promoted in a span of 5 year-time in comparison to the sample of Italian academics with same ranks who did not obtain either ERC or FIRB funding.

Table 2 – Promotions in five years by recipients and gender. Absolute number of academics, column percentage and Chi Square test (italic).

			Sex		
			0	1	Tot
ERC	promotion	No	13	36	49
			39.39%	46.75%	44.55%
		Yes	20	41	61
			60.61%	53.25%	55.45%
		Total	33	77	110
		Pr = 0.477	100%	100%	100%
FIRB	promotion	No	43	56	99
			58.11%	41.18%	47.14%
		Yes	31	80	111
			41.89%	58.82%	52.86%
		Total	74	136	210
		Pr = 0.019	100%	100%	100%
Control Group	promotion	No	211	274	485
			72.51%	67.32%	69.48%
		Yes	80	133	213
			27.49%	32.68%	30.52%
		Total	291	407	698
		Pr = 0.142	100%	100%	100%

An unavoidable covariate is gender, for which attention about how grants are given and what they generate afterwards in terms of outcomes is comprehensively analysed in a recent literature review

(Cruz-Castro & Sanz-Menéndez 2019). Gender does not appear in Table 1 as apparently none changed sex during these years of observation. As Table 2 shows, among ERC recipients there is no statistically difference between women and men in terms of promotions. In percentage, women are more often promoted than men (60.6% vs. 53.2%). Also among the control group sample there is no statistically meaningful difference, although in this group men are more often promoted than women (32.6% vs. 27.5% respectively). FIRB recipients by gender instead are statistically significant in promotions by gender: women are less likely to be promoted. Hypotheses and results sections will check by gender. Regarding promotions, other factors as independent variables together with gender discern whether such promotion dynamic might be explained by publication performances only. It is to be acknowledge that among both ERC and FIRB recipient we don't find a particular misbalance by gender, which is in line with other recent analyses about awardees and respective career outlook (Rastogi Kalyani et al. 2015). The fact that all recipients were compared to a control group at parity of academic rank might explain the absence of apparent gender discrimination (Waisbren et al. 2008), although the paper does not assess the fairness of awarding procedures of both ERC and FIRB. To this latter regard, another study thoroughly investigate ERC grantees by gender (Bautista-Puig et al. 2019), finding a persistent discrimination in awarding grants by gender.

Hypotheses

The dataset is set up to test two hypotheses. For each test we keep distinguished ERC recipients from FIRB ones to compare the effect of both distinctly using the same control group, and avoiding overlapping sets of observations (i.e. when checking ERC recipients, control group does not comprise recipients of FIRB and the other way round). The first hypothesis tests the pay-off of having received a FIRB or an ERC in terms of quality of one's scientific productivity. There are multiple ways to measure scientific productivity. Hence, we use difference-in-difference tests to check whether ERC and FIRB recipients published scientific outputs that:

- Appeared more likely in highly ranked journals (*SJR* is the dependent variable).
- Were more likely and more densely co-authored by a higher number of international scholars (*Intcoll* is the dependent variable);
- Received more citations in comparison to the control group (*Normcit* is the dependent variable).

The second hypothesis is aimed at testing if recipients have been more likely promoted in comparison to control group once controlling not only for treatment, but also for some other confounding variables. This second hypothesis is aimed at having a critical stance towards the so-called St. Matthew effect. According to a mere meritocratic assumption, St. Matthew effect should not exist and should be tackled as a source of inequalities. Considering that we use as confounding variables those listed as dependent ones for the first set of tests, this second hypothesis checks fairly at parity of achievements that anyone might have accrued. This hypothesis is consistent with recent literature (Beerkens 2019; Bloch et al 2014) acknowledging the novelty of ERC prestige effect on careers. Notwithstanding, this study adds insights comparing two similar schemes and checking by meritocratic indicators such as those measuring proxies of quality of research.

Results

Table 3 provides in a stacked tabulation the three tests of the first set of hypotheses by both comparing ERC grants winners against control group and FIRB grants winners against control group. By displaying results in this form we aim at comparing not only grant recipients against a sample of the much larger pool of people without prestigious funding, but also to make a comparison between two similar schemes whose remit is to recognize and promote excellence.

In terms of capacity by recipients to publish in journals that are more highly ranked (SJR), Table 3 shows that ERC recipients increased their performance against the control group. This means that whatever the averages before and after treatment period by both group, ERC recipients ended to increase more (Table 3 – treatment*period coefficients). This is not true for FIRB recipients for which the positive coefficient does not have a statistically significant value. As expectable, among the covariates a major role is played by the binary variable regarding publications listed in first quartile. Also international collaborations and normalised citations are positive covariates. The number of co-authors is interestingly negative, meaning that although correlated positively to other publication patterns, this mode of publishing does not confer per se higher likelihood to publish in top journals.

International co-authorships as defined by variable "intcoll" is another interesting dependent variable as both ERC and FIRB funding schemes aim at facilitating international collaborations and to open researchers to a global, or at least European, perspective – this being in line with argument of openness and more internationalization in research (Primeri et al. 2014). For ERC recipients we note no discernible effect, whereas for FIRB recipients there is even e negative effect in comparison with the control group. Although FIRB recipients increased their average capability to co-author with other scholars affiliated in other countries, also control group sample changed their publication pattern as well. As a result, the effect to have been awarded by FIRB (which stipulated to increase opportunities to attract other international funding schemes and other international relationships) did not produce the expected outcome. In this test, number of co-authors is a positive covariate in predicting international co-authorships as described in literature, especially if looking at trends also in non-traditionally experimental disciplines (Henriksen 2016). Yet, other variables like publishing in open access mode and prestige of journals (SJR) contribute to predict higher levels of internationalization in publications. Citations do play a role. The interpretation of this result could resonate findings by Gaughan and Ponomariov (2008) because being an ERC or a FIRB recipients generate a similar effect to that of being affiliated to centres for which pressure for further grants does not exist because of a regime of financial stability assured by these schemes themselves.

Last, a normalised measure of citations by each publication is tested as a possible outcome of having funded promising scholars such as those who got an ERC or FIRB schemes. In this last test regarding the first hypothesis, Table 3 shows a negative effect for both ERC vs. control group and FIRB vs. control group, as in line with Table 1 averages. Looking at the covariates, only two variables are statistically determinant. One is SJR that is a continuous and highly skewed measure of quality of research; the other is number of co-authors per output. Whilst the former is a reliable indicator of quality of research and arguably is predictor of quality per se and visibility of one's research (both factors increasing citation attraction in a Matthew effect mode), the latter might be an effect

of citing clusters of research and may be interpreted as a stand-alone factor in citation increase (Hsu & Huang 2011). This interplay opens the way to new insight in publication patterns for future studies. This result is not in contradiction with Langfeldt (Langfeldt et al. 2015), although negative effect of receiving grants requires more discussion.

Tab. 3 Difference in differences tests between ERC recipients and FIRB recipients against the same control group. Robust Standard Errors in brackets. Observations clustered by univocal individuals

	Y(SJR)		Y(intcoll)		Y(normcit)	
	ERC	FIRB	ERC	FIRB	ERC	FIRB
treat	0.1788 *	0.1858 **	0.2340 *	0.1110	2.2347 ***	0.9359 **
	(-0.0905)	(0.0615)	(0.1046)	(0.0718)	(0.5766)	(0.2865)
period	-0.1077 ***	-0.1107 ***	0.2486 ***	0.2575 ***	-0.0720	-0.0886
	(0.0229)	(0.0230)	(0.0351)	(0.0338)	(0.0681)	(0.0656)
treat*period	0.2866 ***	0.1232	0.0998	-0.1390 *	-1.7027 **	-0.9112 **
	(0.0930)	(0.0719)	(0.1144)	(0.0650)	(0.5531)	(0.2792)
sex	-0.0063	0.0138	0.0572	0.0959	-0.2384	-0.0512
	(0.0479)	(0.0409)	(0.0660)	(0.0615)	(0.1687)	(0.1026)
OA	0.0925 *	0.1025 **	0.0906 **	0.0831 **	-0.0703	-0.0147
	(0.0364)	(0.0354)	(0.0321)	(0.0305)	(0.1071)	(0.1001)
lang	0.0170	0.0331	0.0046	0.0255	-0.0532	0.0326
	(0.0529)	(0.0503)	(0.0446)	(0.0435)	(0.1603)	(0.1507)
no_authors	-0.0031 **	-0.0044 ***	0.0242 ***	0.0219 ***	0.0531 ***	0.0550 ***
	(0.0013)	(0.0011)	(0.0069)	(0.0053)	(0.0131)	(0.0108)
q3	1.5822 ***	1.5407 ***	0.1123 ***	0.0902 **	-0.1323	0.2139
	(0.0482)	(0.0491)	(0.0284)	(0.0274)	(0.2251)	(0.1319)
normcit	0.0670 ***	0.0794 ***	0.0028	0.0029		
	(0.0137)	(0.0151)	(0.0045)	(0.0057)		
intcoll	0.0978 ***	0.1209 ***			0.0769	0.0539
	(0.0188)	(0.0192)			(0.1245)	(0.1066)
SJR			0.0640 ***	0.0813 ***	1.2025 ***	0.9755 ***
			(0.0165)	(0.0164)	(0.1598)	(0.0933)
_cons	0.1854 **	0.1512 **	0.0877	0.0493	0.2983	0.1584
	0.0618	0.0583	0.0773	0.0708	0.1981	0.1796
p<F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R2	0.3207	0.318	0.2785	0.265	0.1700	0.2017
N (pub.s)	52,388	58417	52,388	58417	52,388	58417
N (inds.)	877	1029	877	1029	877	1029

* p< 0.05;
** p< 0.01;
*** p< 0.001.

Overall, having received a generous funding scheme and its respective largesse in terms of opportunity to be more autonomous in research does not yield always respective increase in quality of research. This general finding confirms the problem of opportunities at the early stage of one's career as a fair determinant for success in future steps (Petersen et al 2011; Horta & Santos 2016). Nevertheless, such schemes such as ERC and FIRB help in expanding one's network of research achieving more internationalization. To this regard, ERC – and also FIRB although to a

lesser extent – appear to work better than INGVAR program (Melin & Danell 2006), although this dataset does not account for further grant capture which in turns was found to be positively associated to this Swedish program. In relation to gender issues, especially for the FIRB Italian funding scheme we can state that results are possibly in line with a similar recent study for which gender is found to be a disadvantage if motherhood of young child/children is in place (Lawson et al. 2019) – being this paper only based on secondary data, information about parenthood are not available. Probably, also a dynamic of restriction of gender differences among younger generation might explain the absence of gender as a statistically significant difference, this being in line with Dutch studies about grants awardees (van Arensbergen et al. 2012) or traditional research about the effect of prestigious nominations on future life course (Chapman & McCauley 1993).

Table 4. – Logistic regressions of promotion after 5 years of receiving ERC or FIRB grants against non-grant recipients (Standard Errors in brackets).

	ERC vs. Control Group		FIRB vs. Control Group	
	Coeff.	*p*	Coeff.	*p*
ERC	2.3150	***		
	(0.4699)			
FIRB			0.9772	***
			(0.2077)	
sex	0.1134		0.2306	
	0.2085		(0.1852)	
OA	0.0046		-0.0317	
	(0.0886)		(0.0717)	
lang	0.0911		0.1453	
	(0.1821)		(0.1714)	
no_authors	-0.0038		-0.0029	
	(0.0031)		(0.0030)	
SJR	0.0082		0.0025	
	(0.0234)		(0.0199)	
Q1	0.1480		0.0910	
	(0.0763)		(0.0702)	
intcoll	0.0809	*	0.0854	*
	(0.0381)		(0.0355)	
normcit	0.0200		0.0183	*
	(0.0105)		(0.0076)	
_cons	-0.2140		-0.3163	
	(0.2413)		(0.2258)	

* p< 0.05;
** p< 0.01;
*** p< 0.001.

Promotions happened following different magnitude of prediction, distinguishing scholars with an ERC or a FIRB in one's curriculum vitae. Among ERC recipients, they benefitted largely from a credentialism effect. It is not only a matter of observing the ERC binary variable, but also observing the other predictors we checked simultaneously. Other merits that can be attained by non-recipients of these schemes do not play the same relevant role as claiming to have belonged (or to still belong) to such club of recipients. This result is particularly relevant because non-recipients who might have performed a come-back in terms of publications and respective quality do not seem to counterbalance recipients' better conditions (only having published with international co-authors is to some extent a predictor of promotions). This finding is similar to previous research about Marie Curie awarded scientists compared to a control group (European Commission 2014). Among FIRB awardees, this "treatment" effect does still exist and it is the most important among

the list of independent variables, but this coefficient is much lower than that among ERC recipients. Apparently, only number of citations is the only adding factor predicting promotions in this second test within Table 4, although this predictor is very small in magnitude, even smaller than international collaborations.

Although other studies found a gender promotion gap (Marini & Meschitti 2018), in this analysis gender does not play a role in being promoted in 5 year-time after winning a major project at conventional levels of confidence. With a threshold of 90% of confidence, there would be gender discrimination against women in the test about FIRB recipients, but there would not be in that about ERC recipients. This result is coherent with research about grant recipients and their future career by gender (Jagsi et al 2011; Danell & Hjerm 2013). Any consideration about gender as an unfair discriminator is probably to be referred to the moment of evaluation of project, for which a different specific research in the stream of evaluation of awarding process would be needed.

Discussion

Our findings about the pay-off of receiving a major grant are similar to those in literature that discuss a tiny marginal advantage for those who receive a main research grant, either in terms of productivity as number of outputs (Jacob & Lefgren 2011a), or measured as citations attraction (Jacob & Lefgren 2011b). Overall, effects are marginal, if present at all. Findings offer to describe a nuanced situation. Not all excellent schemes produce similar effect according to different measure of performativity, nor all excellent academics are the same by type of grant (ERC or FIRB). More in details, the effect of receiving an ERC is substantial in terms of publishing in top journals, whilst this is much less prominent for FIRB recipients. In the case of citations, the effect of receiving these grants is even comparatively negative. Although an effect of continuing to compete for resources may explain comparatively poor performances by both ERC and FIRB recipients, in our case Italian non-recipients of the main two individual funding schemes tend to recover some of the large difference in terms of acquired citations they have for papers they published until the time ERC and FIRB recipients are declared so. In this respect, winning such grants appear to don't boost performance per se, or at least those non-receiving grants as PIs may behave in one the following ways. First, they may establish collaborations to co-authors with recipients and/or other sources to continue to publish regularly. In this way they put themselves in attracting citations effectively enough to reduce the existent divide with grants recipients. Secondly, the accumulation of citations also occurs arguably regardless the prestige of grants. The effect of seniority in an egalitarian system may guarantee presence and minimal fair recognition also for the non-excellent colleagues. Thirdly, as argued by Perc (2014), density of networks, for instance detected empirically in our study by the gross number of co-authors per output, may help non-recipients in increasing citations consistently anyway. Yet, we argue that a fourth concurring explanation might be that academics may create their own enabled conditions to thrive in research like Thomas and Nedeva (2012) found about ERC grantees compared against a control group. Fifthly, the non-stratified Italian higher education system and a poor tradition in buying teaching load for large grants recipients can contribute to produce such non-drifting effect. Moreover, recent emphasis in Italian higher education system based on promotion subject to national fit-for-role assessment that entered into force in the same years of observation, especially the post-treatment ones, have certainly contributed to publish more (Marini 2017; Marini 2014), which in turns tend to possible self-citations patterns (Seeber et al. 2019). Self-citations are more likely to happen in multiple co-

authored works. Last, a seventh reason might be that the Italian system based on egalitarianism and poor degree of institutional stratification, along with national regulations about career progresses do not represent the ideal context to trigger significant Matthew effects. On the contrary, such system may prevent excellence to thrive in the ordinary academic cultural capital. This means that both poaching practices and semantic processes in signifying prestige are less likely to find that fertile terrain that are typical instead in academic labour market such as those like the Anglo-Saxon ones. Whether this latter feature yields more pros or cons this can be only speculative, or normative. Findings let only discuss that to win any of these two schemes, especially the Italian FIRB one, does not produce the expected outcomes when it comes to talk about getting more citations. Nevertheless, the fact that we found no notable increase in performances among awardees, but we found being recipients very conducive of getting promoted, should any observer note that the overall framework of excellence in this particular context at least does not engender expected outcomes. Possibly we detected a clash of cultures between "excellence" and "egalitarianism", ending to reveal some perverse mixtures, especially in the domestic version of excellence – FIRB scheme.

In comparison to Defazio et al. (2009), who found an effect of funding on more intense collaborations (non-specifying if meant as number of co-authors or international co-authorships) only during funding period (and not necessarily in a generic post treatment as a unidimensional point in a timeline like in this analysis), both ERC and FIRB projects are not intrinsically multi-player. This feature of the funding schemes under analysis may explain the inexistent effect of increasing international collaborations by grants recipients.

For all indicators assumed to be affected by winning an ERC or a FIRB project, such moment in career stage may be probably felt and recognized as a watershed between early and mid-careers from one side, and turning established on the other side. This interpretation would be in coherence with recent studies about publications patterns by age cohorts (Jung 2014). However, to discuss some pitfalls in the rhetoric of excellence is necessary. Considering previous research about how grants are bestowed (Bornmann et al. 2008), our study suggests that there is a possible decoupling effect between the goal of boosting career perspective and the assessment of one's potential at the moment of awarding a grant. From one side, in fact, the performance and "numbers" of awardees are clearly superior compared to non-awardees; on the other hand, this fact is a function of one's past and one's opportunities hitherto had at disposal. In other words, the actual potential of non-awardees who are objectively less performing before the moment of (potential) treatment, not necessarily causes comparatively poorer performances just before one's potential does not reveal to be constant or to be truthful. A person who does not publish that well up to a moment when another colleagues of similar age and rank instead did very well not necessarily manifested his/her real and actual potential, acknowledging a critical stance towards the same concept of potential (Scheffler 1985). In empirical and observable terms, receiving a grant could be a manifestation of one's stronger mentor and opportunities for which not only there is no multiplicative effect, but there is also an overlooked attention at the stage of selecting grants winners if the idea of feeding potential is at stake.

Some limitations deserve attention. First of all, in the Italian system, like in any other relatively large system, one single scheme, although basically the only one with features and goals aimed at boosting individual careers, is not the only one an academic may win. Some other competitive grants may as well serve effectively to promote one's career both in terms of securing hygienic conditions (security in a position and infrastructures, including money for some research assistants,

doctoral students, etc.), autonomy to carry on one's research line, but also for signalling one's presence in the community. The case of PRIN projects, for instance, may to some extent produce similar effects even in the position of non-PI of a project. For instance, for a relatively young academic being co-PI in a PRIN project may convey prestige, embeddedness within the epistemic community and opportunities of collaborations. This possibility is sustained by a recent study about the spill-over effect of collaborating with successful researchers (Mirnezami et al. 2020). Moreover, many other funding opportunities, both from national and international sources, may apply.
Second, FIRB scheme explicitly referred to European Framework Programs (FP7 – considering the years when these calls were issued) and it is not of easy retrieval to compute whether each person comprising treatment or control group accessed any European funding scheme, and – this marks the difference – whether they had any leading role (which is in principle observable) or just co-authored and/or participated out of other modes of inclusion (e.g., post-doctoral contracts, informal collaborations, etc. – all actual participations that are unobservable and that are conducive of publishing). Future research about European infrastructure may facilitate access funding information at individual level, as well as funding acknowledgement stored by repositories like Scopus might become more manageable than they are at current stage, helping to compute variables out of non-uniformed and non-standardised string texts.

Conclusion

Overall, this study exposes how the Matthew effect favours promotions in such a way that one may define surreptitious, especially if the effect of being awardee is accounted as a "denominator" for one's performances. Moreover, this analysis finds that FIRB does not generate the same effect of ERC when compared against the same control group sample. It is reasonable to interpret FIRB funding scheme as an isomorphism force (Hallonsten & Hugander 2014) that the Italian context cannot really afford considering its long-standing problem of overall underfunding. For an egalitarian system like the Italian one, probably more recruitment at the level of assistant professorship could be more beneficial at parity of funding endowment because excellence may happen, though in an unpredictable scattered way by institutions, anyway.

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