Does Monetary Support Increase Citation Impact of Scholarly Papers?

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Abstract

One of the main indicators of scientific development of a given country is the number of papers published in high impact scholarly journals. Many countries introduced performance-based research funding systems (PRFSs) to create a more competitive environment where prolific researchers get rewarded with subsidies to increase both the quantity and quality of papers. Yet, subsidies do not always function as a leverage to improve the citation impact of scholarly papers. This paper investigates the effect of the publication support system of Turkey (TR) on the citation impact of papers authored by Turkish researchers. Based on a stratified probabilistic sample of 4,521 TR-addressed papers, it compares the number of citations to determine if supported papers were cited more often than those of not supported ones, and if they were published in journals with relatively higher citation impact in terms of journal impact factors, article influence scores and quartiles. Both supported and not supported papers received comparable number of citations per paper, and were published in journals with similar citation impact values. Findings suggest that subsidies do not seem to be an effective incentive to improve the quality of scholarly papers. Such support programs should therefore be reconsidered.

Introduction

The number of refereed papers that appears in scientific journals along with citations thereto is considered to be the main indicators of scientific productivity and quality of a given researcher, a research organization or a country. Many countries introduced what is called performance-based research funding systems (PRFSs) to streamline the scientific production process and improve the research performance (Jonkers & Zacharewicz, 2016).

PRFSs aim to assess the performances of researchers in a given time period. Some countries provide monetary incentives directly to the researchers in the form "piece rates" or "cash-for-publication" schemes (Heywood, Wei, & Ye, 2011) while others prefer to reward researchers' organizations by allocating funds to them (De Boer et al., 2015). Both "ex ante" and "ex post" assessments are being used for this purpose. Compared with peer review (which requires labor-intensive evaluation processes prior to funding allocation), it is relatively easier, and less costly, to carry out ex post quantitative assessments on the basis of bibliometric measures.

Notwithstanding the type of assessment carried out, research organizations or countries tend to eagerly incentivize their researchers because they in turn expect return on investment (RoI), usually as an increase in the number of papers published by their researchers as well as the citation impact of their papers. However, such monetary incentives do not necessarily produce the intended outcomes, as the existence of PRFSs does not correlate well with the research productivity or quality (Auranen & Nieminen, 2010). The effect of PRFSs on the increase in the quantity of publications is "temporary and fades away after a few years" while the average effect on the quality of publications is "nil" (Checchi, Malgarini, & Sarlo, 2019, pp. 45, 59).

This paper aims to study the effect of the publication support system of the Turkish Scientific and Technological Research Council (TÜBİTAK) on the increase of the citation impact of papers published in scientific journals. The support system is based on the concept of "cash-for-publication" and has been in place since 1993. The authors of papers get rewarded on the basis of Journal Impact Factors (JIFs) and, more recently, Article Influence Scores (AISs) of journals in which their papers are published. The higher the JIF values, the more money the

authors get paid, with a cap of 7,500 Turkish Lira (circa 3,000USD in 2015). We compare all papers published between 2006 and 2015 and indexed in Web of Science (WoS) with at least one author whose address is based in Turkey (henceforth "TR-addressed papers") with those supported by TÜBİTAK to see if supported papers received more citations and if they were published in higher quality journals in terms of JIFs, AISs and quartiles (Q1 through Q4). The rest of the paper is organized as follows: The next section briefly reviews relevant studies. The Data Sources and Method section describes the data and sampling technique used to select the TR-addressed papers along with the matching algorithms written to identify the supported ones. The Findings and Discussion section presents detailed findings. The paper ends with Concluding Remarks.

Literature Review

Performance-based research funding systems (PRFS) came into being in 1980s. The Research Excellence Framework (REF) of UK is one of the oldest PRFSs based on peer review and has been in use since 1986 (De Boer et al., 2015, p. 113). Yet, bibliometric measures such as JIF have become the dominant method used for research evaluation purposes within the last two decades and they are readily available through Journal Citation Reports (JCR) published annually by Clarivate Analytics.

Several countries have developed primarily JIF-based PRFS where JIF values are used (sometimes in combination with peer review) to determine the amount of monetary support per paper. The PRFS use around the world has been reviewed in a number of studies (e.g., Auranen & Nieminen, 2010, De Boer et al., 2015; European Commission, 2010; Geuna & Martin, 2003; Hicks, 2012; Pajić, 2014). The practices tend to vary from country to country. Some reward researchers directly through what is called "cash-for-publication" schemes (e.g., China and Turkey) while others support the affiliated research units or universities (e.g., UK and South Africa) (Heywood, Wei, & Ye, 2011; Tonta, 2017a; De Boer et al., 2015; Harley, Huysamen, Hlungwani, & Douglas, 2016; Lee & Simon, 2018).

PRFSs tend to produce unintended consequences or "side effects" (Geuna & Martin, 2003), cause researchers to develop "opportunistic behavior" (Abramo, D'Angelo & Di Costa, 2018), and eventually become "perverse incentives" (Tomaselli, 2018). Muller (2017) studied the subsidies from the viewpoint of "rent seeking" theory in economics and explored the impact of distorted incentives on academia, academics and society at large. According to rent seeking theory, academics "compete for artificially contrived transfers" in various forms (e.g., grant funding, monetary incentives for publications and citations). These transfers are usually redirected by public institutions from social surplus to rent seeking academics on the basis of bibliometric measures that are thought to measure academic success better and "provide greater reassurance of quality" (p. 59). Such measures are therefore increasingly supplanting (rather than supporting) peer review used to judge the quality of scholarly output, and universities are "creating institutional rules and practices that actively incentivize rent-seeking behavior" (Muller, 2017, p. 61). In South Africa, for instance, the amount of monetary support per paper (which may be as high as 10,000USD per a single-authored paper) is the same, regardless of where the paper has been published as long as the outlet is "accredited" by the Department of Higher Education and Training. Thus, one can submit their work to lower quality journals with relatively lower standards of peer review in order to collect subsidies quickly and more often. This may, in turn, have created a "powerful perverse incentive" and encouraged at least some researchers to "game" with the system and produce "fraudulent –or ethically questionable– publications" (Muller, 2017, pp. 63-64). Muller (2017) underlines the dilemma of such incentives as follows:

> Under the rent seeking conceptualization of such systems, appeals to individual or institutional integrity are not likely to be successful. The system directly creates

> incentives for the activities cautioned against, undermining cultures of ethical practice, and therefore only measures that carry suitable material punishment are likely to counteract these undesirable effects. (p. 64)

The side effects of PRFSs are not limited only with researchers publishing in lower quality outlets or "seeking out 'easier' publication types" (Sīle & Vanderstraeten, 2019, p. 86). Subsidies tend to discourage types of research that require more time to carry out using novel experiments prolonging the publication process, thereby giving way to papers with little or no societal impact whatsoever (Geuna & Martin, 2003; Tonta, 2017b, pp. 27-30). Moreover, some researchers simply prefer to publish in "predatory journals" and set up what is called "citation circles" to benefit more from PRFS (Good, Vermeulen, Tiefenthaler, & Arnold, 2015; Teodorescu & Andrei, 2014, pp. 228-229). South African researchers published as much as five times more papers in predatory journals than those in the United States or Brazil did (Hedding, 2019). While the number of South African publications has doubled (as pointed out earlier) after the introduction of the subsidy program, the ones published in predatory journals increased 140 times during the same period (2004-2010) (Mouton & Valentine, 2017).

Turkey, too, has a bad reputation and ranks third (after India and Nigeria) in the world among 146 countries in terms of number of papers published in predatory journals (Demir, 2018, p. 1303). Beall's (now defunct) list of predatory journals includes 41 such journals originating from Turkey, second highest after India (Akça & Akbulut, 2018, p. 264). Although no study has so far been carried out on TR-addressed papers published in predatory journals, it is likely that several such papers have been subsidized in the past under the support program. For example, more than 80% of the subsidies for papers in anthropology in 2015 went to a single predatory journal in this field in which Turkish researchers have published a total of 127 papers, most of which had had nothing to do with anthropology (Tonta, 2017b, p. 80).

Despite the side effects and undesired outcomes of PRFSs, there appears to be a commonly held belief in research funding and research performing institutions that subsidies would increase the number of papers and their citation impact. Researchers motivated by such subsidies would produce more papers with higher quality. However, the relationship between subsidies and the increase in productivity and quality is not clear-cut (Auranen & Nieminen, 2010). While there appears to be some evidence that subsidies increase the number of papers to some extent, this is not reciprocated with a similar increase in the quality of papers in terms of their citation impact (Butler, 2003, 2004; Good et al., 2015; Osuna, Cruz-Castro, & Sanz-Menéndez, 2011). For instance, the number of South African publications has almost doubled in seven years (2004-2010) after the implementation of the subsidy system. Yet, their citation impact (number of citations per paper) has decreased steadily (Pillay, 2013, p. 2). A small-scale study carried out at the University of Cape Town after the implementation of PRFS showed that the number of output is negatively correlated with both the number of citation counts of papers and their field-weighted citation impact. Although the variance explained was relatively modest, findings indicate to some extent that greater subsidy seems to be "associated with lower citation impact," which may, in part, be due to the fact that the PRFS currently in use "does not factor in research quality and impact" (Harley et al., 2016). Similarly, the number of TR-addressed papers listed in citation indexes has increased 19-fold between 1993 (when TÜBİTAK's support program began) and 2015 (from 1,500 papers to more than 28,000) (Tonta, 2017b, p. 32). Turkey has jumped from 37th place in 1993 to 18th in 2008 in the world ranked by the number of indexed publications. Yet, findings of an interrupted time series analysis based on 390,000 TR-addressed publications listed in the WoS database between 1976 and 2015 (of which 157,000 or 40% were subsidized between 1997 and 2015) showed that the support program seems to have had no impact on the increase in the quantity of TR-addressed publications (Tonta, 2017a). Moreover, the citation impact of TR-addressed papers has constantly decreased throughout the years and is well below (40%) that of the world average of all papers (Çetinsaya, 2014, p. 127; Kamalski et al., 2017, p. 4).

It appears that PRFSs do not help much in terms of improving the quality of research and force researchers to choose between "cash or quality" (Hedding, 2019). We test this conjecture with reference to Turkey and see if the subsidy system currently in use in Turkey has improved the citation impact of TR-addressed papers by comparing the number of citations per paper, JIFs, AISs and quartiles of journals in which both supported and not supported papers were published. We present below the data sources and method used to analyze the data.

Data Sources and Method

We used the well-known bibliometric measures of number of citations per paper, JIF, AIS and JCR quartiles to compare the citation impact of supported and not supported TR-addressed papers. JIF is defined as the "average" citation impact of papers published in a given journal within a given time period. AIS takes into account five years' worth of citation data for a given journal and weights citations on the basis of JIFs. If citations come from high impact journals, they are weighted more heavily. AIS is similar to Google's PageRank algorithm in that it uses the whole JCR citation network to calculate the AIS for a given journal. Unlike JIS, AIS indicates if each article in a journal has above- or below-average influence, 1.000 being the average of all journals included in JCR's citation network (Article, 2019). AIS is more stable and can therefore be used in interdisciplinary comparisons where journals have varying publication and citation patterns, although both metrics are highly correlated (r = .9) (Arendt, 2010). JIF is used to categorize journals under at least one subject category, and journals under each subject category are divided into four quartiles based on their JIF values (the first 25% of the journals with highest JIFs constitutes Q1, the second 25% Q2, etc.).

In order to identify all TR-addressed papers published between 2006 and 2015 and indexed in Web of Science (WoS), we used the following advanced search query (December 2, 2017):

> **AD=**(Turkey OR Turquie OR Türkei OR Türkiye OR Turquia)
> **Timespan:** 2006-2015. **Indexes:** SCI-EXPANDED, SSCI, A&HCI. **PubType**: Article

We found a total of 225,923 TR-addressed papers and downloaded them. We obtained the payment information for 100,919 TR-addressed papers whose authors sought financial support from TÜBİTAK through its Support Program of International Publications (UBYT). Altogether some 44% of all papers were supported (range: 59% in 2007; 28% in 2015).

We then stratified all TR-addressed papers by year and scrambled them within each year (in case they had an inherent order by author or journal name, for example) so that certain records would not appear disproportionally in the sample. We wrote a macro to select every 12th and 75th records (these numbers were randomly chosen) out of the stratified list of all TR-addressed records (225,923). Sample size being 2% of the population, we obtained a total of 4,521 records in the sample using the stratified probability sampling technique. The sample size for each year ranged between 1.86% and 2.05%, average being 1.99% (which is quite close to 2%).

Next, we wrote a second macro to match up journal data from JCR and InCites with respective years to identify bibliometric characteristics of journals (e.g., JIF, AIS, Times Cited, Quartiles and so on) in which TR-addressed papers appeared along with the number of citations that each paper received, if any (February 2, 2018). Data were then added to all the records (seven journals did not match due to inconsistencies in journal names, which were added manually).

Finally, we wrote a third macro to match the list of papers supported by TÜBİTAK with all papers (supported or not). (Some 64 records did not match due to inconsistencies in paper titles, which were added manually.) This enabled us to compare both paper and journal characteristics for both supported and not supported papers (e.g., number of citations for papers, and JIF, AIS and quartile for journals). The matching algorithm seems to have worked quite well. Altogether, 44% of all papers were supported by TÜBİTAK. In the sample, the percentage of supported papers was somewhat lower: 1,679 out of 4,521 (or 37%). The difference (7%) is

due to inconsistencies in data (such as punctuation marks and abbreviations used in titles of papers and journals). Nevertheless, we looked at the data more closely. Papers appeared in 9,463 different journal titles. The ones supported by TÜBİTAK appeared in 2,336 different journal titles. Some 2,153 journals (or 92%) were represented in the sample, of which 986 (or %42) had published at least one supported TR-addressed paper between 2006 and 2015. We do not expect such small fluctuations to have any considerable impact on the analysis that follows.

We used MS Excel and SPSS 23 for data analysis and visualization; independent samples t-test for significance, as our sample size was relatively large (4,521) (Lumley, Diehr, Emerson, & Chen, 2002); and chi-square for test of independence. We used an alpha level of .05 for all statistical tests.

Findings and Discussion

As indicated earlier, the number of papers published between 2006 and 2015 is 225,923. Table 1 and Fig. 1 provide average and median JIFs and AISs of journals in which all TR-addressed papers appeared during this period. The median JIFs range between 0.998 (2012) and 1.379 (2015) while median AISs range between 0.321 (2012) and 0.457 (2010). Close to half the papers were published in low impact journals (i.e., JIF below 1.000), and their AIS values were less than half (around or below 0.400) of that of the world average (1.000). Although there seems to be a slight increase in recent years in median JIFs and AISs of papers, this has probably more to do with the continuing increase in JIFs over the years (Fischer & Steiger, 2018).

Table 1. Average and median JIFs and AISs of journals in which all TR-addressed papers published (2006-2015)

Year	Average JIF	Average AIS	Median JIF	Median AIS
2006	1.481	0.508	1.087	0.411
2007	1.311	0.454	1.091	0.406
2008	1.444	0.536	1.098	0.403
2009	1.409	0.481	1.072	0.399
2010	1.546	0.526	1.245	0.457
2011	1.327	0.459	1.053	0.384
2012	1.401	0.455	0.998	0.321
2013	1.626	0.504	1.231	0.351
2014	1.769	0.537	1.234	0.342
2015	1.988	0.574	1.379	0.368

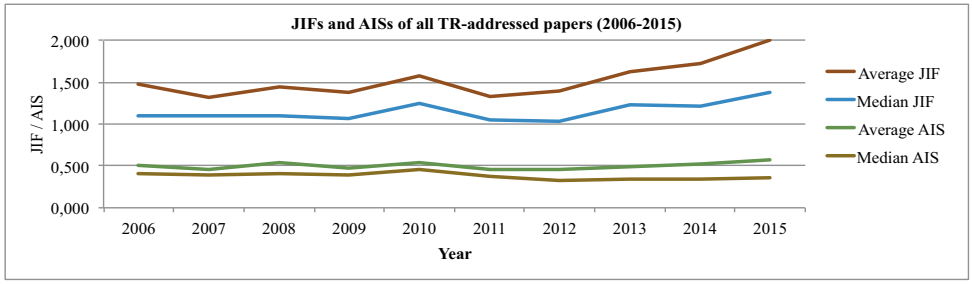

Fig. 1. Average and median JIFs and AISs of journals in which all TR-addressed papers published (2006-2015)

Findings below are based on the stratified probability sample of 4,521 papers (2006-2015). The great majority (90%) of the papers in the sample were Science papers. Social Science and Arts and Humanities papers constituted about 9% and 1% of all papers, respectively. Papers in the sample were cited a total of 55,383 times. The average number of citations per paper was 12 (SD = 42). Half the papers received five or fewer citations (min. = 0, max. = 2,246). Only 1% (or 45 papers) received 100 or more citations while 32% received 10 or more. Some 13% of papers were not cited at all. As expected, Science papers received the overwhelming majority of the total number of citations (over 92%) followed by Social Science papers (7%) and Arts and Humanities papers (less than 1%).[1]

Table 2 provides descriptive statistics and statistical test results for papers in the sample. As indicated earlier, 37% (1,679) of papers in the sample were supported by TÜBİTAK. Supported papers collected 43% (23,654) of all citations. On average, supported papers were cited slightly more often (M_{all} = 14.1, SD = 22.5) than not supported ones (M_{all} = 11.0, SD = 49.8). This difference was significant t (4,519) = -2.39, $p < .05$; however, the effect size was rather small (r = .04). Similarly, supported science papers were cited somewhat more frequently on average (M_{sci} = 14.5, SD = 22.7) than not supported ones (M_{sci} = 11.3, SD = 52.1). Again, although the difference was significant t (4,081) = -2.28, $p < .05$, the effect size was infinitesimal (r = .04).

Table 2. Descriptive statistics and test results

	Citation impact	Supported papers				Not supported papers				t	p	r
		N	Mdn	M	SD	N	Mdn	M	SD			
All papers	# of cit.	1679	7.0	14.1	22.5	2842	4.0	11.0	49.8	-2.39	**.02***	.04
	JIF	1624	1.2	1.6	2.3	2696	1.1	1.5	2.0	-1.07	.28	.02
	AIS	1520	.4	.5	.9	2405	.4	.5	0.9	-.39	.70	.01
Science	# of cit.	1508	7.5	14.5	22.7	2575	4.0	11.3	52.1	-2.28	**.02***	.04
	JIF	1482	1.3	1.6	2.4	2473	1.1	1.5	2.0	-1.17	.24	.02
	AIS	1388	.4	.5	.9	2218	.4	.5	.9	-.48	.63	.01
Social Science	# of cit.	171	4.0	10.6	20.1	267	3.0	8.7	13.8	-1.18	.24	.05
	JIF	142	1.2	1.3	1.0	223	1.0	1.4	1.3	-.43	.67	.02
	AIS	132	.4	.4	.3	187	.4	.5	.50	.52	.61	.03

Notes: *N*: Number of papers; *# of cit.*: Number of citations; *Mdn*: Median; *M*: Mean; *SD*: Standard Deviation; *t*: t-test; *p*: p value; *r*: effect size; *cit.*: citation; *JIF*: Journal Impact Factor; *AIS*: Article Influence Score; *: statistically significant at alpha level .05.

That during a 10-year period a supported paper in general and a supported science paper in particular received on average about three more citations than a not supported one did and that the difference was significant has probably more to do with the sample size than a true effect. This is because insubstantial differences and small effect sizes can still be significant in a relatively large sample (as is the case in this study). To put the difference into a better perspective, assuming that any given paper had on average six years to collect citations, a supported paper received about half a citation more per year than a not supported one did. This can hardly be considered a substantial difference. In fact, the statistically significant difference per paper between the numbers of citations for supported (M_{ssci} = 10.6, SD = 20.1) and not supported (M_{ssci} = 8.7, SD = 13.8) Social Science papers disappeared (t (436) = -1.18, $p > .05$), as Social Science papers constituted less than one tenth of all papers in the sample. Fig. 2 provides a comparative view of the number of citations per paper for all papers as well as for

[1] Note that 49 Arts and Humanities papers that received a total of 289 citations were excluded from further analysis as bibliometric characteristics of Arts and Humanities journals are not listed in JCR.

Science and Social Science papers. Boxplots show the means, medians, and first and third quartile values for both supported and not supported papers.

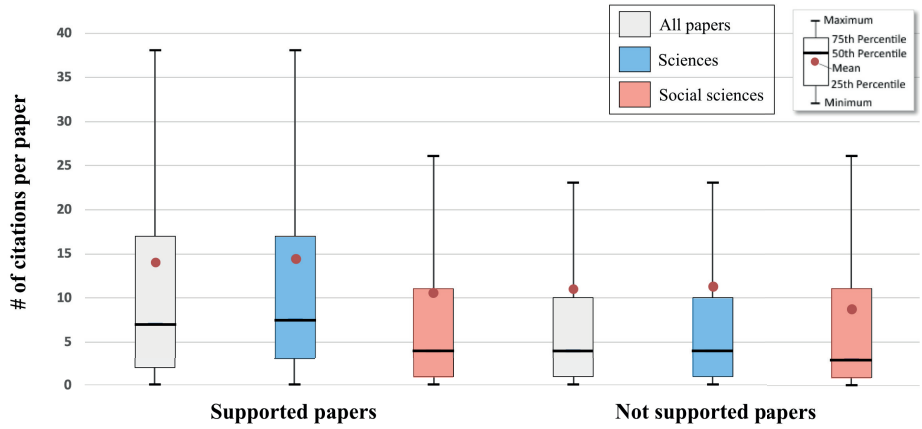

Fig. 2. Number of citations per paper for supported and not supported TR-addressed papers

Table 2 also provides data on citation impact values (e.g., JIF and AIS) of journals in which TR-addressed papers were published. On average, the JIF values of journals publishing all supported papers (M_{all} = 1.6, SD = 2.3), supported Science papers (M_{sci} = 1.6, SD = 2.4), and supported Social Science papers (M_{ssci} = 1.3, SD = 1.0) were quite similar to those publishing not supported ones (M_{all} = 1.5, SD = 2.0; M_{sci} = 1.5, SD = 2.0; and M_{ssci} = 1.4, SD = 1.3, respectively). The differences were not statistically significant in all three cases (t_{all} (4,318) = -1.07, $p > .05$; t_{sci} (3,953) = -1.17, $p > .05$; and t_{ssci} (363) = 0.41, $p > .05$, respectively). Likewise, the differences between the AIS values of supported and not supported papers were not statistically significant, either (see Table 2 for details). Fig. 3 provides the boxplots for JIF and AIS values of journals publishing both supported and not supported papers for all papers as well for Science and Social Science papers. JIF and AIS data of both supported and not supported papers were highly skewed with heavy tails, indicating that papers were mostly published in relatively mediocre or low impact journals. Average JIF and AIS values of journals obtained from the sample are consistent with those of all journals in the population (see Table 1, Fig. 1).

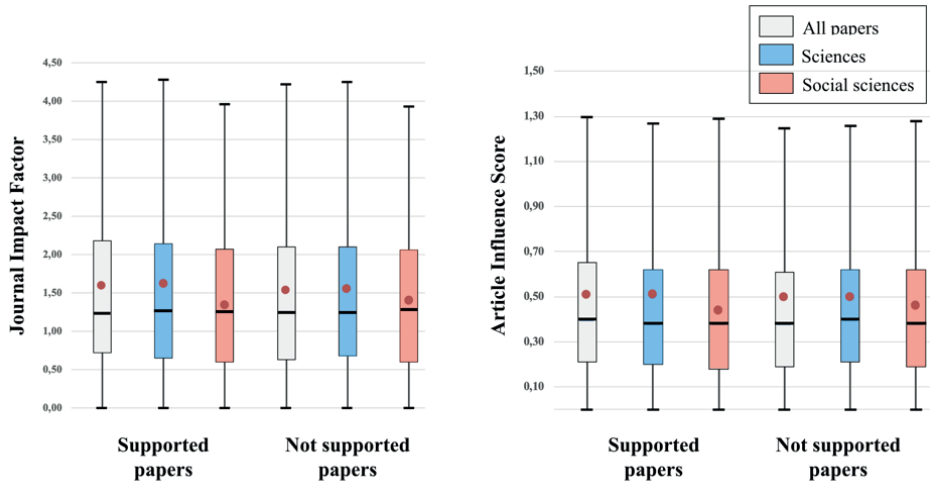

Fig. 3. Journal Impact Factors (left panel) and Articles Influence Scores (right panel) of journals publishing supported and not supported TR-addressed papers

Fig. 4 below provides the percentage distributions of JIF values of supported and not supported papers. Note that the percentages of supported and not supported papers were quite similar to each other, supporting the results of the statistical tests further. Correlation between JIF and AIS values of journals publishing TR-addressed papers was quite high (Pearson's r = .946), explaining 90% of the variance in the data[2] and confirming the findings of similar studies (e.g., Arendt, 2010). We therefore do not provide the distributions of JIF and AIS values of supported and not supported Science and Social Science papers separately, as they are similar to those in Fig. 4. Percentages of supported Science and Social Science papers in the sample were 37% and 39%, respectively. The percentage of supported Social Science papers that appeared in journals with no (zero) JIF values (17%) was much higher than that of Science papers (2%) because Social Science papers got supported more generously to increase their number (Tonta, 2017b).

We also looked at if supported papers were published in journals listed in higher JCR quartiles under their respective subject categories. It is interesting to note that more papers that appeared in journals with the lowest citation impact (Q4) were supported (28%) than those with the highest citation impact (25%) (Table 3). Almost half (48%) the supported Science papers appeared in Q1 and Q2 journals (as opposed to 36% of supported Social Science papers) (Table 4). The percentage of Science papers published in Q1 journals (26%) is almost twice that of Social Science papers (14%) (Fig. 5). The percentage of supported Social Science papers with no quartiles was the same as those with no JIFs (17%). The difference between the quartile distributions of supported and not supported Science papers was statistically significant ($X^2(4) = 39.6$, $p < .05$, $r = .01$). This may be due to the more restrictive support policy towards Science papers published in the lowest quartile of journals (Tonta, 2017b, pp. 23-24). The percentages of supported papers by quartiles suggest that the support system seems to have failed to be more selective, thereby rewarding more papers that were published in journals with lower JCR quartiles and thus lower citation impact.

[2] Not all journals in which TR-addressed papers were published had both JIF and/or AIS values listed in JCR. The correlation coefficient is based on 3,961 papers with both values. Papers that were published in journals with no JIS and/or AIS were also excluded.

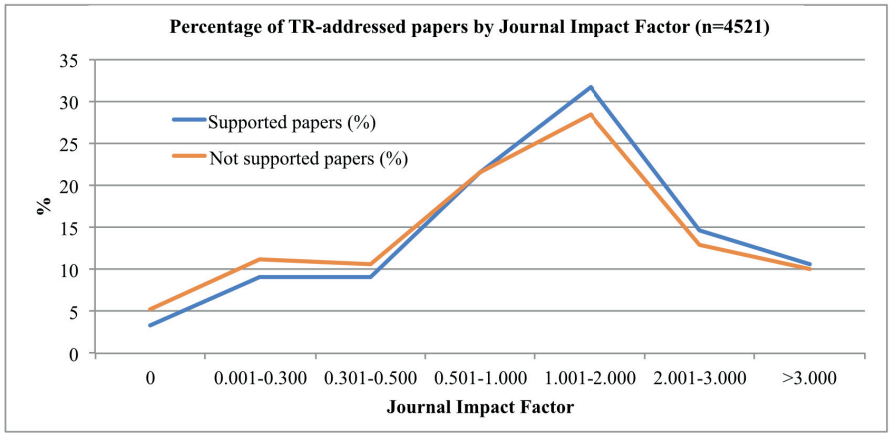

Fig. 4. Percentage of TR-addressed papers by Journal Impact Factor (n=4521)

Table 3. Distribution of TR-addressed papers by JCR Quartiles (n=4521)

	Quartiles of supported papers						Quartiles of not supported papers					
	N/A	Q1	Q2	Q3	Q4	Total	N/A	Q1	Q2	Q3	Q4	Total
N	55	415	370	364	475	1679	146	536	542	683	935	2842
%	3	25	22	22	28	100	5	19	19	24	33	100

Table 4. Distribution of papers by JCR quartiles (Social Science vs. Science (n=4521)

		Quartiles of supported papers						Quartiles of not supported papers					
Subject	Freq / %	N/A	Q1	Q2	Q3	Q4	Total	N/A	Q1	Q2	Q3	Q4	Total
Social Sciences	N	29	24	38	35	45	171	44	41	48	50	84	267
	%	17	14	22	21	26	100	17	15	18	19	32	100
Sciences	N	26	391	332	329	430	1508	102	495	494	633	851	2575
	%	2	26	22	22	29	100	4	19	19	25	33	100

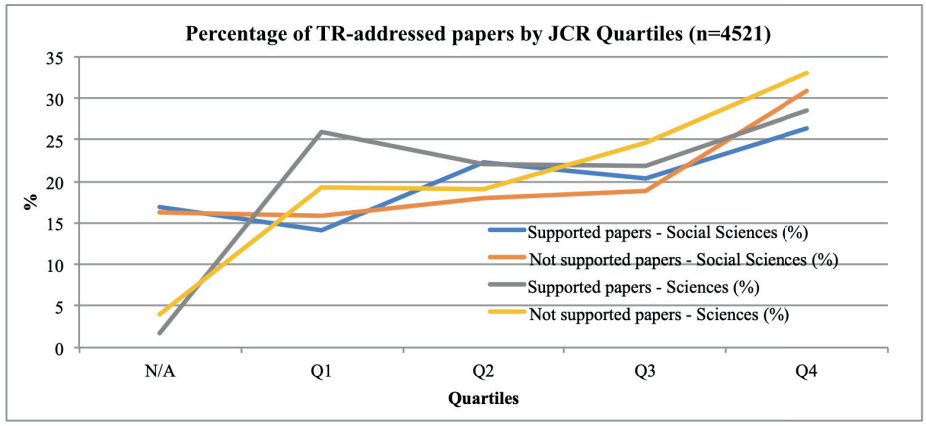

Fig. 5. Percentage of papers by JCR Quartiles (Social Science vs. Science) (n=4521)

The main findings of this study with regards to about 226,000 TR-addressed papers published between 2006 and 2015 are as follows: They were published in relatively low impact journals. More than half appeared in journals with AIS values well below the world average of AIS value for all journals (1.000) indexed in WoS. TR-addressed papers did not get cited very often, as half the papers received between zero (13%) and five citations within the study period. Supported and not supported papers collected comparable number of citations per paper. Supported and not supported papers were not significantly different from each other in terms of JIFs, AISs, and quartiles of journals in which they were published. The distributions of the supported and not supported Science and Social Science papers by citation impact values did not differ much, either.

Findings of the current study corroborate to some extent the findings of earlier studies of PRFSs (Auranen & Nieminen, 2010; Butler, 2003, 2004; Checchi, Malgarini, & Sarlo, 2019; Geuna & Martin, 2003; Good et al., 2015; Osuna, Cruz-Castro, & Sanz-Menéndez, 2011). We have not observed a negative correlation between JIFs, AISs, and quartiles of supported and not supported TR-addressed papers. Yet, the average number of citations per paper and JIF, AIS and quartile values were quite similar for both supported and not supported papers, indicating that the support system of TÜBİTAK has not increased the citation impact of TR-addressed papers, which confirms the findings of an earlier study (Tonta, 2017b).

We lack empirical data as to why the support system did not have any considerable effect. One reason might be that researchers have had to write papers for tenure and academic promotion anyway. Or, they may have found support through other sources (e.g., project budgets or other academic incentives). Yet another reason might be that the amount of support (based primarily on JIF values) was perhaps not attractive enough for some researchers, especially when we consider the fact that many TR-addressed papers were published in relatively low impact journals and the total amount per paper has to be divided by the number of co-authors (Tonta, 2017b).

Concluding Remarks

Findings indicate that both supported and not supported TR-addressed papers were somewhat similar in terms of average number of citations per paper. They have been published in journals with similar JIFs, AISs, and quartiles. Contrary to the expectations of the research funders, payments transferred to researchers through the support program do not seem to have played much role in improving the citation impact of TR-addressed papers. This suggests that subsidies based on bibliometric measures function poorly as incentives to increase the quantity and quality of the scholarly papers.

The support system seems to have rewarded the authors of papers who published in mediocre or low impact journals relatively more often. Despite comparatively lower "piece rates" paid for papers published in such outlets, many researchers sought financial support nonetheless. This might be an indication that subsidies may have encouraged some researchers to develop "opportunistic behavior" and act like "rent seekers" interested only in reaping the relatively modest monetary benefits of the support program without much consideration for the quality of their papers, a conjecture begging further research.

In conclusion, the support program of TÜBİTAK and similar academic incentives of the Turkish Higher Education Council should be reconsidered.

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